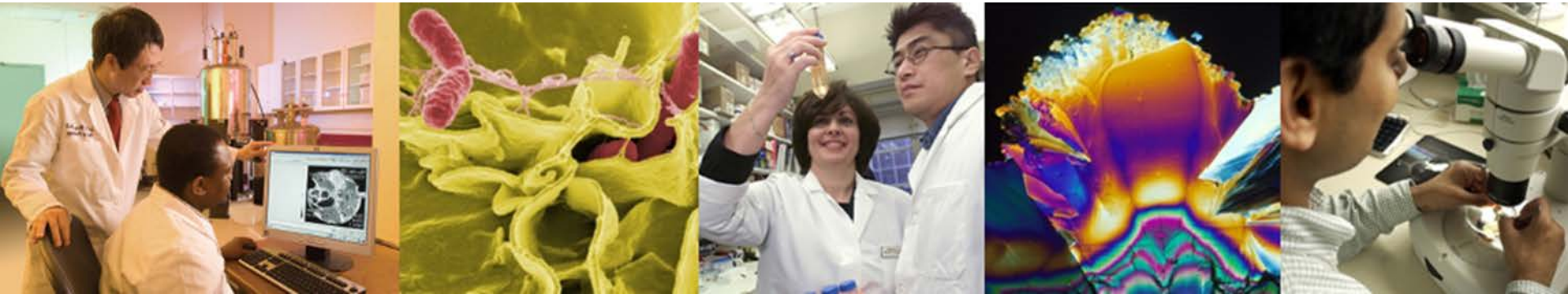


The Next Generation Researchers Initiative

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

September 11, 2017



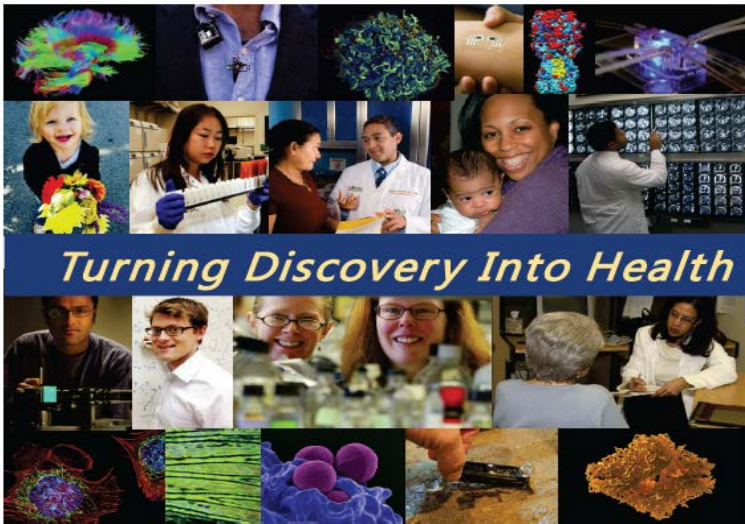
Lawrence A. Tabak, DDS, PhD
Principal Deputy Director, NIH



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 Observation



PERSPECTIVE



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PERSPECTIVE

Rescuing US biomedical research from its systemic flaws

Bruce Alberts^a, Marc W. Kirschner^b, Shirley Tilghman^{c,1}, and Harold Varmus^d

^aDepartment of Biophysics and Biochemistry, University of California, San Francisco, CA 94158; ^bDepartment of Systems Biology, Harvard Medical School, Boston, MA 02115; ^cDepartment of Molecular Biology, Princeton University, Princeton, NJ 08540; and ^dNational Cancer Institute, Bethesda, MD 20892

Edited by Inder M. Verma, The Salk Institute for Biological Studies, La Jolla, CA, and approved March 18, 2014 (received for review March 7, 2014)

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 prospective students from entering our profession—and making it difficult for seasoned investigators to produce their best work. This is a recipe for long-term decline, and the problems cannot be solved with simplistic approaches. Instead, it is time to confront the dangers at hand and rethink some fundamental features of the US biomedical research ecosystem.

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.

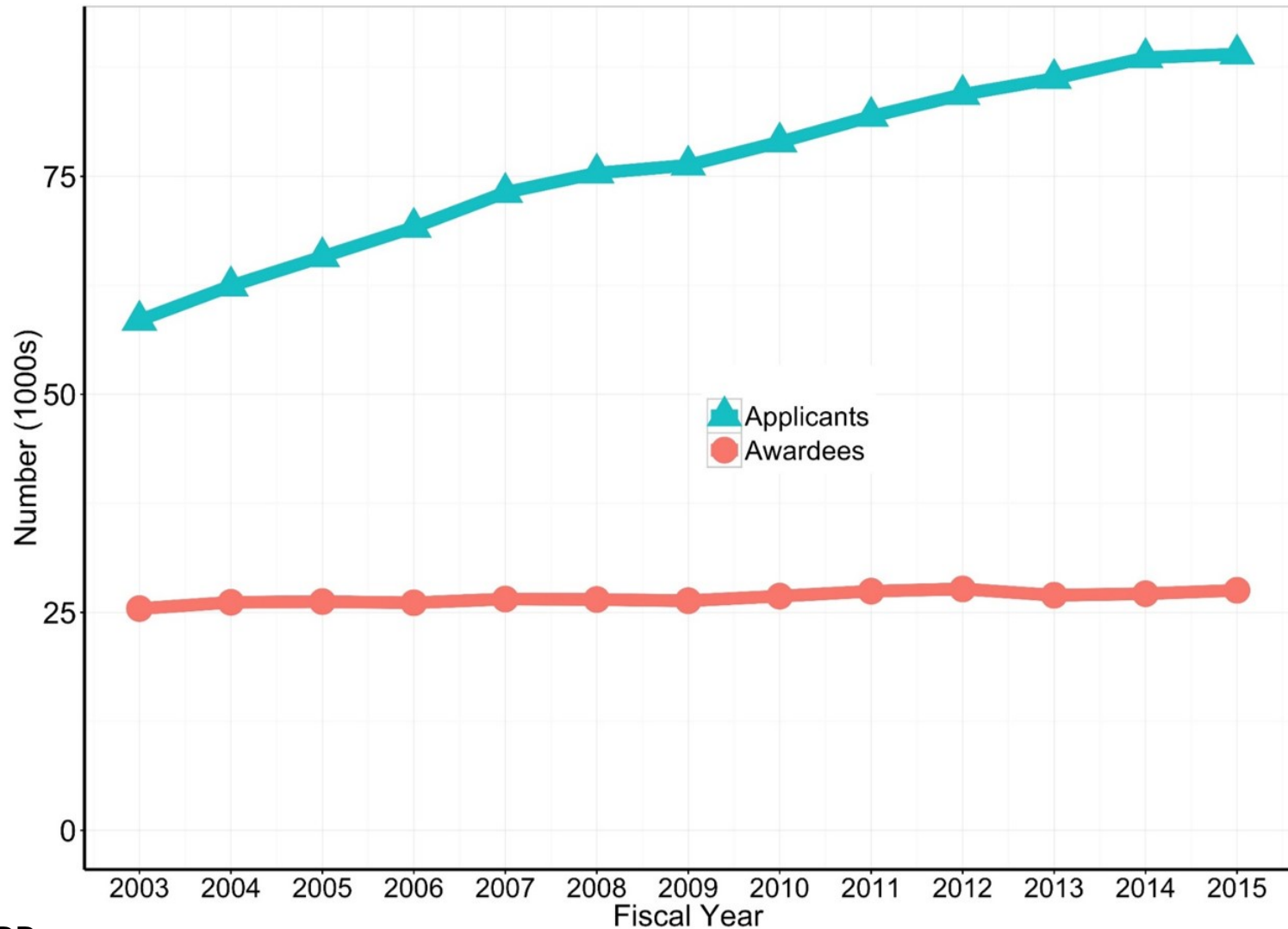
What Young Scientists Are Saying

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

Hypercompetition: Applicants and Awardees for NIH RPGs



Media

LOST IN ACADEMIA

So Many Research Scientists, So Few Openings as Professors

Gina Kolata @ginakolata JULY 14, 2016

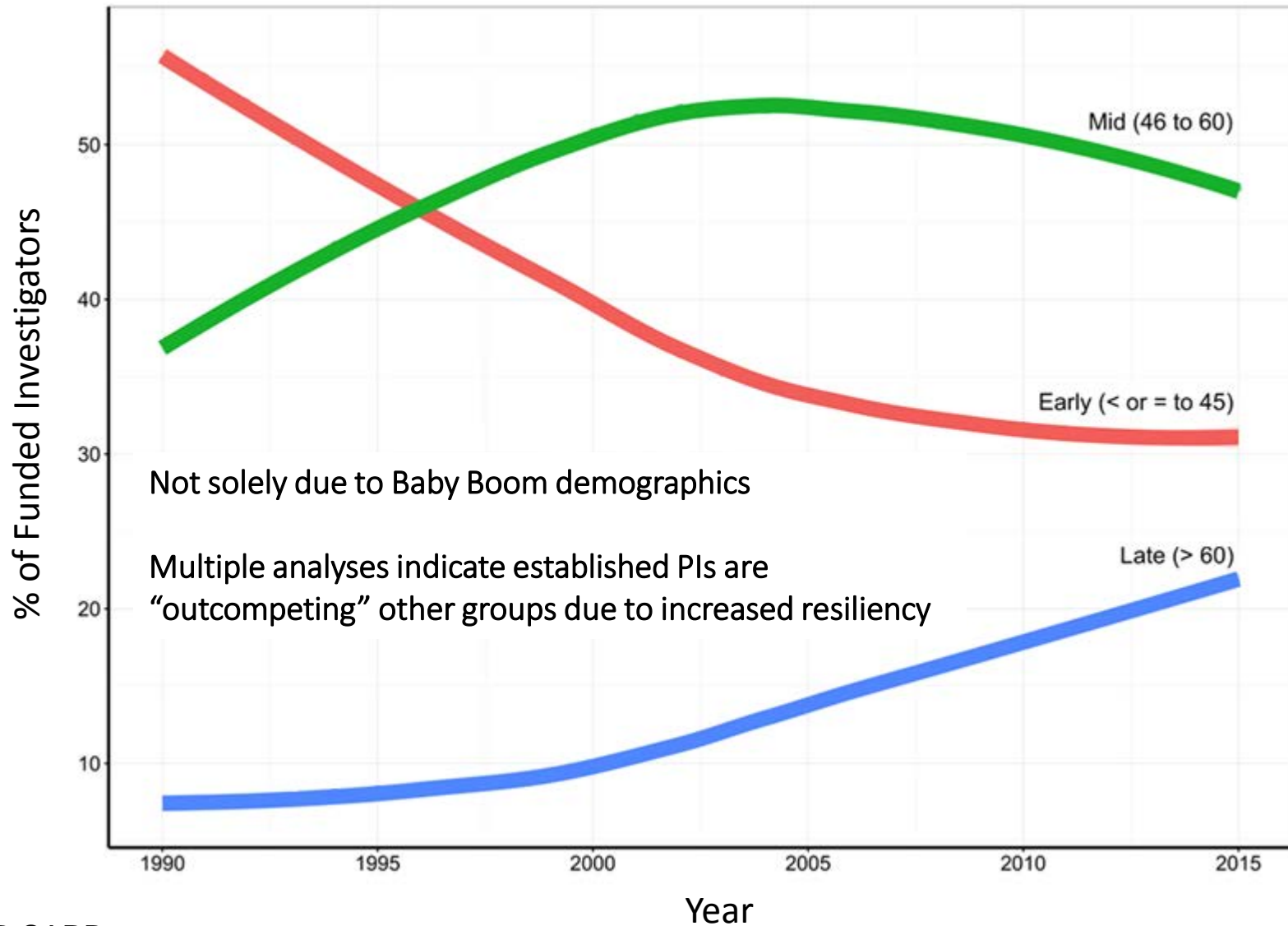
“The average age at which the lucky few actually get a grant has steadily increased — it is now 42, up from 35 in 1980, which means biomedical scientists in academia are essentially apprentices until middle age. And [the tendency](#) is for the grants to go to scientists who already have them, making it harder and harder to break into the system.”



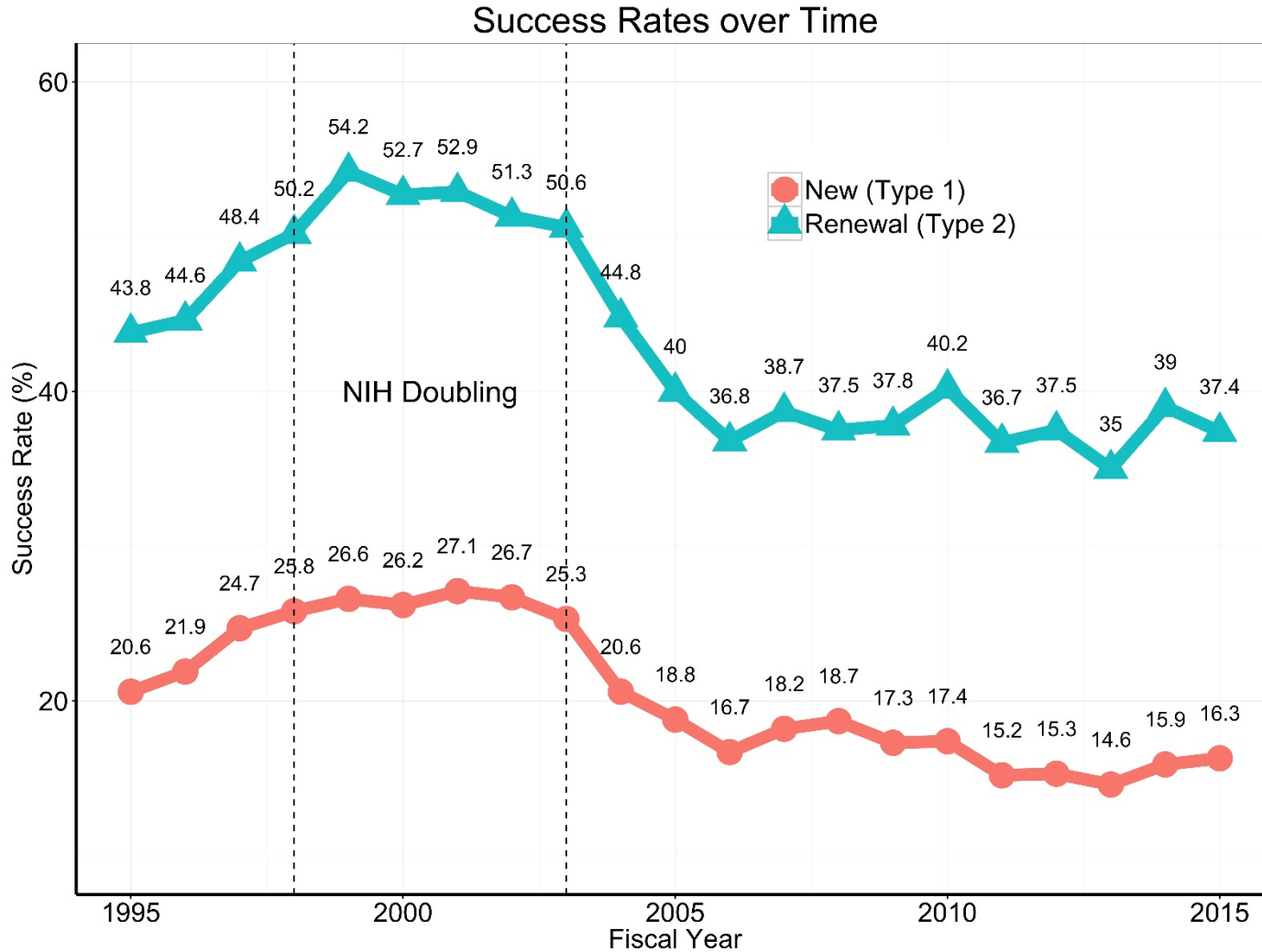
Emmanuelle Charpentier, who became leader of the Max Planck Institute for Infection Biology last year, spent the previous 25 years moving through nine institutions in five countries. Karsten Moran for The New York Times

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



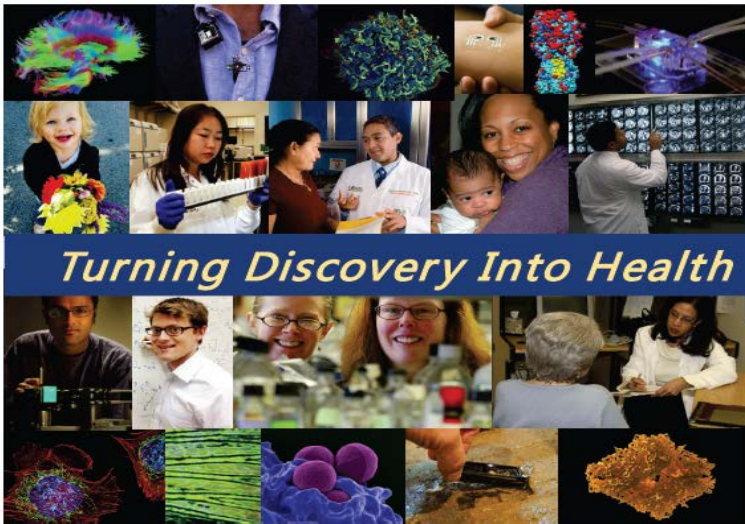
Getting a Grant Is Harder Than Renewing a Grant



NIH Can't Afford to Support Everything: Good Stewardship is Essential

NIH-Wide Strategic Plan

Fiscal Years 2016-2020



Enhance Stewardship

- Recruit/retain outstanding research workforce
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H.R.34 - 21st Century Cures Act

114th Congress (2015-2016) | [Get alerts](#)

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](#))

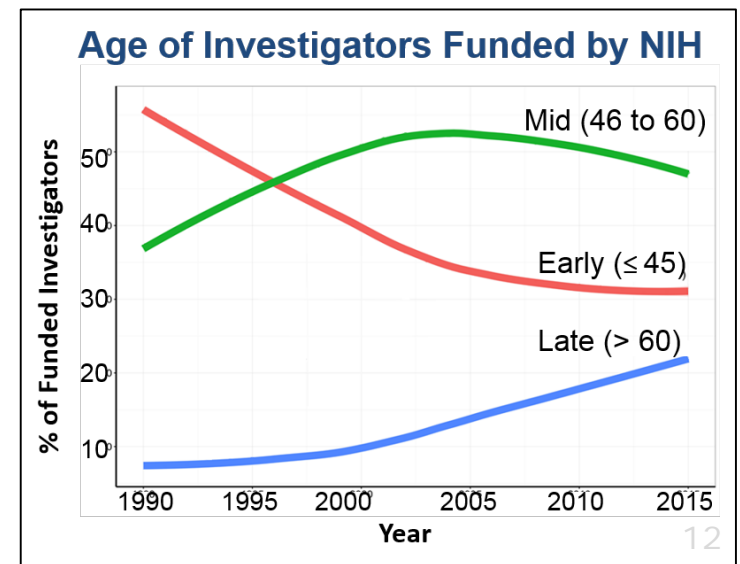
Purpose

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 Act¹. This policy supersedes previous notices on new and early stage investigators (NOT-OD-08-121, NOT-OD-09-013 and NOT-OD-09-134).

<https://grants.nih.gov/grants/guide/notice-files/NOT-OD-17-101.html>

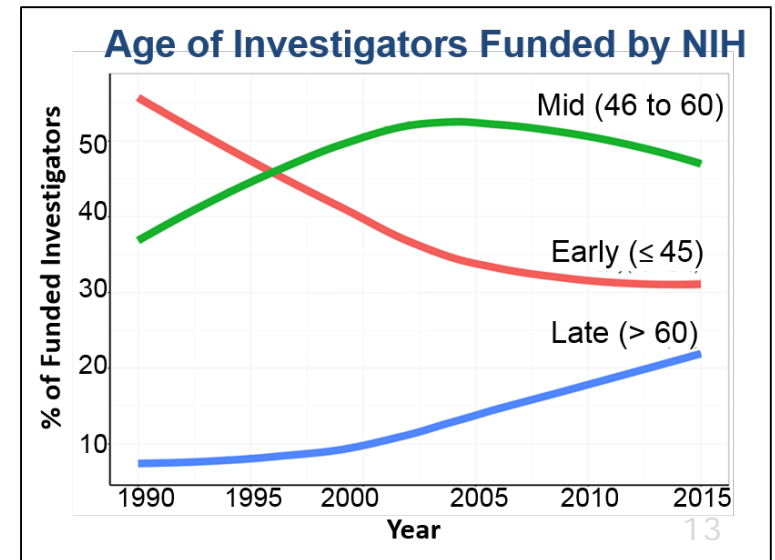
How Do We Increase the Number of Early-Career Funded Scientists?

- 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

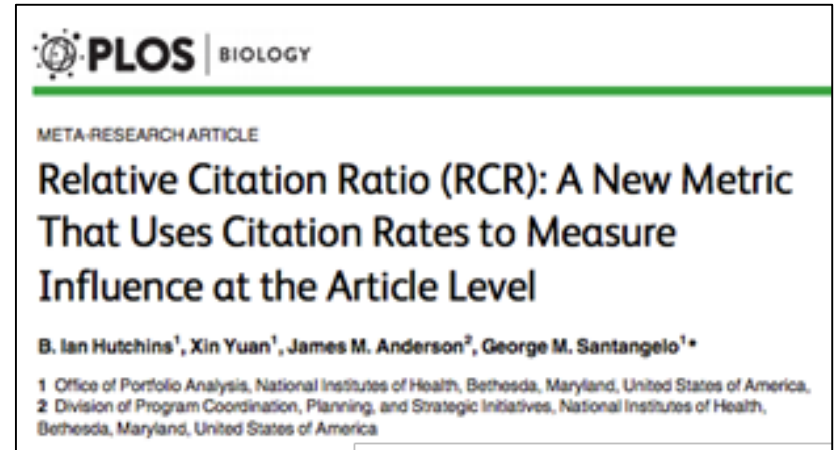
- **Long term:** Assess the value of our investments by measuring outcomes such as:
 - Disruptions in prevailing paradigms
 - Patents/licenses
 - New technologies
 - New medical interventions
 - Changes to medical practice
 - Improvements in public health

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>

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

Extramural *Nexus*

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

Posted on **June 16, 2017** by **Mike Lauer**

NIH's Next Generation Researchers Initiative



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- Dr. Valerie Florance - NLM
- Ms. Jill George – OCPL
- Dr. Patricia Haggerty – NIAID
- Ms. Adrienne Hallett – OLPA
- Dr. Richard Ikeda – OER
- Dr. Stephen Katz – NIAMS
- Ms. Rebecca Kolberg – OCPL
- Dr. Michael Lauer – OER
- Dr. Aviva Litovitz – DPCPSI
- Dr. Jon Lorsch – NIGMS
- Dr. John J. McGowan – NIAID
- Dr. Andrew Miklos – NIGMS
- Dr. Lauren Milner – OSP
- Ms. Julie Muroff – OGC
- Ms. Renate Myles – OCPL
- Ms. Katrina Pearson-Robinson – OER
- Dr. Roderic Pettigrew – NIBIB
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- We acknowledge with thanks the many significant contributions made by members of the ACD and the continued contributions of the ACD working group



NIH...

Lawrence.Tabak@nih.gov

Turning Discovery Into Health

