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## THE NEXT GENERATION OF BIOMEDICAL AND BEHAVIORAL SCIENCES RESEARCHERS

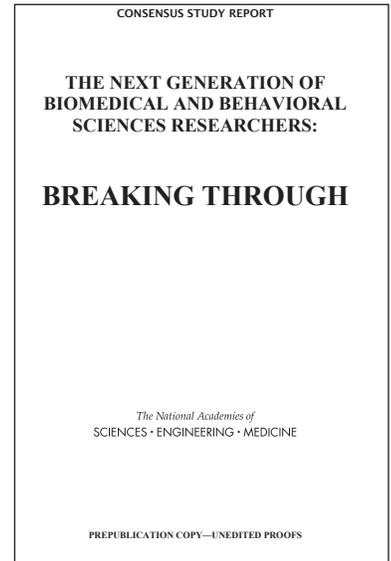
### Breaking Through

With a series of recommendations to the National Institutes of Health (NIH), Congress, the National Science Foundation (NSF), biomedical research institutions, and principal investigators (PIs), this report provides guidance to mitigate or prevent the United States from endangering its position as the global leader in biomedical research. The report's recommendations aim to support the next generation of America's biomedical researchers as they seek to identify and pursue the independent research career path that best serves them and the research community, whether in an academic, industry, government, or other setting.

A robust biomedical research community requires diverse and innovative researchers. So it is especially critical for the federal government, research institutions and other actors across the biomedical research enterprise to take steps that can assist researchers early in their training with better information regarding career pathways and their viability, and that will incentivize researchers to make a career decision at an appropriate time that best serves their own interests, the biomedical research community's interests, and the national interest.

### RECOMMENDATIONS TO ADDRESS AN ENDURING NATIONAL PROBLEM

The United States is widely considered to have the world's preeminent biomedical research enterprise. A key component to preeminence is to ensure that a steady stream of highly capable, innovative, and diverse researchers enter the field. Yet there is a growing concern that the pathways for individuals to enter the U.S. biomedical research system are beset by several core challenges that undercut its vitality, promise, and productivity and that could diminish its critical role in the nation's health and innovation in the biomedical industry.



Three problems are seen as particularly concerning for individuals seeking to enter biomedical research. First is the belief that the long, and growing, amount of time required before a researcher can reasonably secure enough support to establish an independent research laboratory is discouraging talented researchers from staying in the system. The average age of first receipt of a major NIH independent grant, the R01, has risen from 36 years old in 1980 to 43 years old in 2016<sup>1</sup> while the share of biomedical Ph.D. recipients able to secure a tenure-track academic research position within 6 years has fallen from 55 percent in 1973 to 18 percent as recently as 2009 (Cyranoski et al., 2011). Second, much of the currently available career information relevant to early career researchers focuses almost exclusively on academic positions—despite the fact that the majority of employment opportunities are outside of academia. Compounding these realities are the growing years spent in prolonged postdoctoral positions characterized by low salaries, inadequate training and mentorship for the diversity of research careers, and few opportunities for independent research or professional advancement.

## OVERCOMING BARRIERS

Over the past two decades, numerous reports have recommended steps to address problems in the biomedical research workforce, yet the underlying problems have persisted or worsened. This report is acutely focused on how best to overcome the obstacles that have served as barriers to change.

One of those obstacles, the report finds, is the absence of shared responsibility for these issues across the biomedical research enterprise. Institutions tend to look to NIH to solve problems across the entire system; there is no mechanism for collaboration among the many entities that must act to solve these systemic problems. To ensure coordination and ongoing collective guardianship of the biomedical enterprise, the report recommends that Congress establish a public-private body called the Biomedical Research Enterprise Council (BREC) that would provide coordination and would work to hold multiple stakeholders accountable for systemic reform.

Another factor is the decline since 2003 in NIH funding in real dollars. At the very moment that these earlier reports were surfacing, Congress was pulling back from its historic support for NIH, which compounded some of the tensions in the system, and left no funding free to address them. The report recommends increases in NIH funding to address this problem.

Finally, still another barrier to change has been a lack of evidence-based policy ideas—an approach to reform that applies the same traditions of experimentations and assessment that characterize the science of our nation to the policies that shape that science. The report therefore recommends that Congress and the NIH promote the development of innovative policy experimentation that seeks to improve and accelerate transitions into independent careers, and by creating a Next Generation Researcher Innovation Fund to support these experimental projects.

## KEY RECOMMENDATIONS TO RESEARCH INSTITUTIONS

- Limit postdoctoral training to 5 years and provide more stable, non-faculty research opportunities for the next generation of researchers by increasing the number of staff scientist positions with salary and benefits appropriate for a permanent staff member.
- Collect, analyze, and disseminate comprehensive data on outcomes, demographics, and career aspirations of biomedical pre- and postdoctoral researchers using common standards and definitions as developed in concert with NIH.
- Promote, document, and disseminate existing and planned efforts to reduce the barriers to recruiting and retaining diverse researchers.
- Provide support and evidence of effective training, mentoring, and professional development programs for postdoctoral researchers.

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<sup>1</sup>See [https://grants.nih.gov/grants/new\\_investigators/Age\\_Degree-First-Time-117-16\\_RFM\\_11s\\_25march2016\\_DR-Approved.xlsx](https://grants.nih.gov/grants/new_investigators/Age_Degree-First-Time-117-16_RFM_11s_25march2016_DR-Approved.xlsx) (accessed February 17, 2018).

## KEY RECOMMENDATIONS TO PRINCIPAL INVESTIGATORS

- Provide every postdoctoral researcher supported on their grant with high-quality training experiences that prepares them for a successful research careers.
- Provide both a postdoctoral training and mentoring plan plus a diversity and inclusion plan in all grant proposals and updates of those plans in all progress reports to NIH if funded.

## KEY RECOMMENDATIONS TO NIH

- Phase-in policies requiring the collection and publication of outcomes and demographics data on biomedical pre- and postdoctoral researchers, using common standards and definitions, as a prerequisite for further funding to incentivize compliance.
- Require: (1) a training and mentoring plan, and (2) a diversity and inclusion plan at the institutional and PI level as part of grant applications.
- Phase in a cap (3 years suggested) on salary support for all postdoctoral researchers funded by NIH research grants and multi-project grants following completion of a robust pilot study (or studies) of sufficient size and duration to assess the feasibility of this policy and the opportunities it provides.
- Increase the salary for postdoctoral researchers supported on Ruth L. Kirschstein National Research Service Award (NRSA) and expand awards or create new competitive awards to support postdoctoral researchers' advancement toward an independent research career.
- Promote innovative pilot projects of research institutions and other stakeholders that seek to improve and accelerate transitions into independent careers. Create a Next Generation Researcher Innovation Fund to support these experimental projects.

## KEY RECOMMENDATIONS TO CONGRESS

- Establish a public-private Biomedical Research Enterprise Council (BREC) to address ongoing challenges confronting the Next Generation of Biomedical Researchers, tasked with providing ongoing collective guardianship of the biomedical enterprise, and serving as a forum for sustained coordination, consultation, problem-solving, and assessment of progress toward implementation of the recommendations put forth in this report.
- Consider increasing the NIH budget, specifically to implement the recommendations in this report and to sustain NIH's recently announced Next Generation Researchers Initiative.
- Extend or establish an employment tax credit to research and development (R&D) firms for hiring recently minted Ph.D.'s, M.D.'s, and M.D.-Ph.D.'s and make the credit higher for small- to medium-sized R&D firms and firms that recruit into R&D activity for the first time.

## COMMITTEE ON THE NEXT GENERATION INITIATIVE

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**For More Information . . .** This Consensus Study Report Highlights was prepared by the Board on Higher Education and Workforce based on the Consensus Study Report *The Next Generation of Biomedical and Behavioral Sciences Researchers: Breaking Through* (2018). The study was sponsored by Bloomberg Philanthropies and the National Institutes of Health. Any opinions, findings, conclusions, or recommendations expressed in this publication do not necessarily reflect the views of any organization or agency that provided support for the project. Copies of the Consensus Study Report are available from the National Academies Press, (800) 624-6242; <http://www.nap.edu> or via the Board on Higher Education and Workforce web page at <http://www.nationalacademies.org/PGA/BHEW>.

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