National Postdoctoral Association

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What are some of the major issues in training?
Biomedical science has changed significantly over the past decades – training programs need to keep up

It was easier to “know everything” there was to know about ACTIN in 1980

![Graphs showing changes in PubMed, Nucleotide Sequences, and Protein Structures from 1980 to 2017.](chart.png)
“Reproducibility” is a problem

Science has lost its way, at a big cost to humanity

Researchers are rewarded for splashy findings, not for double-checking accuracy. So many scientists looking for cures to diseases have been building on ideas that aren't even true.

October 27, 2013 | Michael Hiltzik
The research incentive structure is sometimes in conflict with training - trainees vs. workforce?
The current careers in the biomedical workforce require training beyond academic research.

- Tenure track jobs
- Non-tenure track faculty
- Non-science jobs
- Industry researchers
- Gov't researchers
- Non-research science jobs

National Postdoc Association 2018
Underrepresented minorities and women are leaving the biomedical academic pathway

Valentine, Lund, Gammie 2016 CBE/LSE
The biomedical research community does not reflect the diversity in this country.
What is NIH doing to address these issues?
Educator-Initiated Innovations

- **Training modules to enhance data reproducibility (R25)**
  
  **NIH Rigor and Reproducibility Training Modules**

  **Introduction to the Modules [PDF, 110KB]**

  **Module 1: Lack of Transparency**
  In order to reproduce someone else’s findings adequately, the experimental methods, rationale and other pertinent information must be accessible and understandable. This module highlights the need to include all relevant details in publications to ensure that other studies are able to build upon the research appropriately and accurately.

  **Lack of Transparency Discussion Material [PDF, 97.2KB]**

- **Administrative supplements T32 predoctoral grants**
  
  - Rigor & Reproducibility
  - Career Development
  - Skills Development – technical, operational, professional
  - Safety in the Research Environment - NEW
Catalyzing Change at in the Training Environment at Research Intensive Institutions
Calls for Change

Rethinking graduate education

A substantial evidence suggests that over 70% of new PhDs in science in the United States will not have careers in academic research, yet graduate training in science has followed the same basic format for almost 100 years, heavily focused on producing academic researchers. Graduates that go on to work in other sectors will not just demand that graduate education change, they are already working within systems they know must change to meet the needs of the majority of its students.

Many academic, governmental, and professional leaders and organizations have lamented this dissonance and have suggested warranted adjustments, but most of these have been minor changes to graduate student offerings. It is time for a more fundamental look at graduate education in science to ensure it meets the needs of students who desire to produce graduate students as researchers and mentors. The system also works for the very best graduate students at the top research universities, whose career paths often do not fit toward academic research, indeed, because the current approach has generated too much early graduate student interest to fulfill with success. "Do so harm while doing good" will have to be the mantra of any system redesign.

Some relatively new government programs and curricular additions are positive steps that are likely to guide graduate student career formation. For example, the Bioinnovation and Research Workforce Project from the US National Institutes of Health supports innovative approaches to help biomedical graduate training better reflect the range of careers that PhDs might pursue. In addition, initiatives are also working on the problem. As an example, the National Academies of Sciences Engineering and Medicine has called for changes to graduate education in science to ensure it meets the needs of students who desire to produce graduate students as researchers and mentors.

This calls for a rethinking of graduate education to reflect the evolution of careers in science and the demands of the 21st century. Some experiments and small dislocations have not been real progress, and it is time to do that scale of analysis and include an action plan for making the recommended changes.

"Substantial changes in graduate education are recommended—not because the previous approaches were wrong—but because the technological leaders of this century must have skills crafted to meet its demands."

ADVANCING GRADUATE EDUCATION IN THE CHEMICAL SCIENCES

Summary Report of an ACS Presidential Commission

Submitted to ACS President Balamir J. Shekharzad on December 3, 2012
For many years, NIGMS has been the leader in the training of excellent biomedical scientists.

Data: FY15 QVR/FTK Predoctoral T32, Parent F31 (PA-11-111, 14-147), Diversity F31 (PA-11-112, 14-148); Kenny Gibbs
NIGMS Biomedical Graduate Training

While preserving the best elements, NIGMS would like to catalyze changes in biomedical graduate training to keep pace with the rapid evolution of biomedical research
Pilot NIGMS-specific funding announcement PAR-17-341

- Emphasize trainee development – providing the skills needed to transition into careers in the biomedical research workforce

- Focus on rigor & transparency, responsible & safe conduct of research, as well as diversity & inclusion throughout the training experience.

- Address conflicts in the incentive structure of the research enterprise (treating trainees as workforce).

- Require mentor training and oversight of trainee/mentor matches.

- Require obtainable and measurable training objectives.

- Require the collection and dissemination of data on the success/failure of educational interventions and post career outcomes on publicly available sites.
New- Program Plan - Career Preparation

- Post outcomes
- Introduce trainees to a range of careers in the biomedical research workforce
- Provide opportunities to develop needed skills and for experiential learning (internships, shadowing, informational interviews)
Career Preparation

BEST

PHARMA • BIOTECH
ENTREPRENEURSHIP • CONSULTING
GOVERNMENT • PUBLIC POLICY
TECHNOLOGY TRANSFER • I.P. • LAW
VENTURE CAPITAL • FINANCE
BASIC RESEARCH • TEACHING
“Programs like BEST offer students and postdocs additional insight into other viable career options and help them to identify and cultivate transferable skills, the significance of which is often overlooked. It also turns the abstract “someday” into something real. It forces busy scientists to take the amorphous “future plans” off of the back burner (in a lab environment where it is often difficult to plan beyond the next experiment, committee meeting, or grant deadline) and thrusts it into the forefront.”

-Lauren Tanabe, Ph.D., recent Postdoctoral Fellow at Wayne State University

As a PhD student or postdoctoral scientist, you have to focus on your research while also planning for your future career. This section provides tools to help you explore your interests, narrow down career options, and get a job.

Read more of Lauren Tanabe’s thoughts regarding BEST on the Wayne State blog.
Connect with Lauren and other students and postdocs in the LinkedIn BEST Trainee Network.
NIH Scientific Workforce Diversity

Sustaining Diversity
Strategies to Sustain Workforce Diversity

LEARN MORE

Science of Diversity
Building Evidence
Sociocultural Factors
Sustaining Diversity
Information about how NIH promotes a diverse scientific research workforce

Learn how diversity supports our mission, find opportunities to participate in diversity programs, meet researchers, and more. Whether you are a science student, trainee, faculty member, or someone who is interested in diversity programs, you can find what you are looking for here.

Questions, comments, and suggested resources should be directed to extramuraldiversity@mail.nih.gov, or use the Contact Us link below.
Diversity Program Consortium
How is BUILD different from previous programs?

Targeting 3 levels at once:

• Student
• Faculty
• Institution

Taking a scientific approach to interventions
Network Mission: To promote and provide mentoring to diversify the biomedical research workforce

Major NRMN Goals/ Program Components:

- **Match/link** mentees to mentors and coaches
- **Train** mentors, coaches & mentees
- **Refer** mentees to career and research resources
- **Promote** the value of career mentoring across the nation
For Phase II – will support research on the science of mentorship, networking and navigating career transitions
RFA-RM-18-004
Research to Understand and Inform Interventions that Promote the Research Careers of Students in the Biomedical Sciences (R01)

Test interventions to establish the value of:

- Building self-efficacy and a scientific identity
- Reducing stereotype threat
- Mitigating unconscious bias
- Diminishing imposter syndrome
- Creating networks
- Mentoring, coaching, sponsoring
- Forming cohorts and learning communities
- Emphasizing cultural assets
- Engaging family and support networks
- Increasing cultural awareness

Funding announcement – coming soon
NIGMS Diversity Focused Training Programs

Pre-Kindergarten – high school

Undergraduate  |  Postbac  |  Graduate MS  |  Graduate PhD  |  Postdoctoral

RISE  |  BRIDGES to BAC  |  PREP  |  BRIDGES to DOC  |  RISE  |  IRACDA

MARC  |  IMSD

F31 Diversity Fellowships  |  IMSD
Trainee Benefits
• Strategies to optimize the NRSA program
• Clarify leave policies and ability to request an extension for interruptions to permit completion of the training
  • Sudden loss - accident, illness, or other personal situation including birth or adoption of a child
• Enhancing benefits for NRSA postdoctoral trainees or fellows is a top priority (pending budget and implementation plan)
• Pilot research support mechanisms for NRSA recipients to promote independence – under discussion
Early Stage Investigators
To provide institutional research training opportunities (including international) to trainees at the undergraduate, graduate, and postdoctoral levels.

1. Select Role
   - Awardee
   - Appointee

2. Select Career Level
   - Select

Mentored Research Scientist Career Development Award

K01

For support of a postdoctoral or early career research scientists committed to research, in need of both advanced research training and additional experience.
“The Director of the National Institutes of Health shall ... develop, modify, or prioritize policies, as needed ... to promote opportunities for new researchers and earlier research independence, such as policies to increase opportunities for new researchers to receive funding, enhance training and mentorship programs for researchers, and enhance workforce diversity.”
Updates on NIH Next Generation Researchers Initiative (NGRI)

• Presented at June 2017 NIH Advisory Committee to the NIH Director (ACD)

  • Enhance support for Early Stage Investigators

• Being refined with feedback from NIH leadership, and ongoing input from an NGRI ACD working group

• Input from an NIH supported National Academies of Sciences, Engineering and Medicine (NASEM) NGRI study anticipated in April 2018.
The Next Generation of Biomedical and Behavioral Sciences Researchers: Breaking Through

- Public Report Release Meeting
- Thursday, April 12, 2018 – 1:30 - 3:30pm EDT
- In Person and Webcast
Early Stage Investigators

An *early stage investigator* or *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.

*Ensure ESI status is up to date*

**Clinicians** should update their eRA commons profile if it currently has the end date of medical residency and provide the end date of postgraduate clinical training including fellowships.**
Request an Extension of ESI Status

- PD/PIs may experience a lapse in their research or research training or have circumstances that necessitate less than full-time effort during their ESI status.

- The NIH will consider requests to extend ESI status for medical concerns, disability, family care responsibilities, extended periods of clinical training, natural disasters, and active duty military service.

- Extensions are determined on a case by case basis at the discretion of NIH.

- ESIs may request an extension of their eligibility under existing ESI procedures (NOT-OD-09-034) described in the Extension Request Form.
Resources for Current and Next Generation Researchers
ECR Program was Developed to

The goals of the ECR Program are to:

- Train and educate qualified scientists without prior CSR review experience so that they may develop into critical and well trained reviewers
- Help emerging researchers advance their careers by exposing them to a peer review experience that may make them more competitive as applicants
- Enrich the existing pool of NIH reviewers by including scientists from less research-intensive institutions as well as those from traditionally research-intensive institutions
Using NIH RePORTER to Find the Appropriate NIH Program Officer: Matchmaker

Enter abstracts or other scientific text and Matchmaker will return lists of similar projects from RePORTER or program officials associated with those projects. These matches are based on the terms and concepts used in the submitted text. Up to 15,000 characters are permitted. Matchmaker summarizes the projects by the program official, institute or center, review panel, and activity code.

Enter your Text:

Defects in Xeroderma Pigmentosum Group A, XPA, cause a debilitating disease characterized by an extreme sensitivity to ultraviolet light and other DNA damaging agents such as cisplatin. Full length XPA has significant homology to the C-terminus of the yeast homolog Rad14. We found that the conserved C-terminal region of Rad14 as well as human XPA partially rescues the defect of a RAD14 deletion, verifying the functionally equivalent region. To better understand the molecular nature of disease variants, we engineered known XPA mutations into RAD14 and assayed for sensitivity to DNA damaging agents. The XPA disease alleles have a range of phenotypes and map by trait to specific regions of the protein. The regions include a zinc finger, which appears to be important for overall protein stability, and a second zinc finger, which contains a homology to bipartite nuclear
Using NIH RePORTER to Find the Appropriate NIH Program Officer: Matchmaker

**Matchmaker Results**

181 Program Official(s) from the matched projects. (500 projects maximum).

Click on chart labels to filter search results by the Institute/Center or Activity Code.

**Program Official**

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New Dashboard: Data on NIH Funded Workforce

http://report.nih.gov/bmwdashboard/app/#/!

NIH-Funded Principal Investigators: All

About the Biomedical Research Workforce Dashboard

This dashboard is designed to provide a single interface for information on the US biomedical research workforce. Currently, data from NIH is displayed, but information from other sources like the Association of American Medical Colleges will be added in the future. Please note that this beta version of the dashboard is still undergoing final testing and validation.

RPG Applicants & Awardees with Funding Rates

Division of Biomedical Research Workforce

National Postdoc Association 2018
Questions?
Comments?