Overview of NIGMS Training and Diversity Program

Training, Workforce Development and Diversity

Alison Gammie
October 17, 2016
TWD Program Directors’ Meeting Goals

• Exchange Training Ideas and Innovations

• Network

• Strengthen Communication with NIH (TWD Listens)

• Develop skills to articulate training goals and evaluate interventions/activities
Training is a collaboration across NIGMS
Core TWD Team

Patrick Brown
Anissa Brown
Luis Cubano
Jessica Faupel-Badger
Alison Gammie
Kenny Gibbs
Sailaja Koduri
Mercedes Rubio
Desirée Salazar
Mike Sesma
Shiva Singh
Training is a collaboration across NIGMS
TWD Team in the scientific divisions
Departures

Robin Broughton
RISE

Shawn Gaillard
MARC

Alison Hall
Deputy Director TWD

Michele Hamlet
BRIDGES

Sue Haynes
Genetics T32

Peter Preusch
MSTP

Allison Scott
BUILD/NRMN/CEC

Pamela Thornton
BUILD
TWD Nearly 650 Programs at 226 Institutions
NIGMS Administered Training Programs

Pre-Kindergarten – high school

Science Education Partnership Awards (SEPA)

Undergraduate | Postbac | Graduate MS | Graduate PhD | Postdoctoral
---|---|---|---|---
RISE | PREP | RISE | IRACDA
BRIDGES to BAC | BRIDGES to DOC | NRSA Fellowships
MARC | | IMSD | |
IMSD | | | |
BUILD | Diversity Supplement Program | | |
| | | | |
| | | | |
| | | | |
| | | | |
TWD PD Meeting June 2017 8
~50 Institutions with TWD Program and SEPA
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
The Scientific Workforce Analysis and Modeling Program (U01)

Supports research that employs a systems-based approach to understanding the underlying dynamics of the workforce and its trainees, examining strategies for retaining and advancing highly skilled independent investigators, and enhancing the diversity of the scientific workforce.
TWD funds meetings
• 1,800+ student presentations
• 370 exhibit booths
• Scientific and professional development sessions, enhanced networking opportunities
• Five hotels within 2-3 blocks of convention center
Changes for 2017

- Meeting registration and meals sold separately
- Meals provided through meal plan from independent catering vendor

<table>
<thead>
<tr>
<th>Registration Type</th>
<th>Discount Registration On or Before Oct. 10</th>
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<tbody>
<tr>
<td>Undergraduate/Post-baccalaureate Students</td>
<td>$125</td>
</tr>
<tr>
<td>Graduate Students/Postdoctoral Scientists</td>
<td>$150</td>
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<tr>
<td>Non-Students</td>
<td>$200</td>
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<table>
<thead>
<tr>
<th>Meal Plan Ticket</th>
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<tr>
<td>All meals including awards banquet</td>
<td>$450</td>
</tr>
<tr>
<td>All meals excluding awards banquet</td>
<td>$375</td>
</tr>
<tr>
<td>Awards banquet only</td>
<td>$90</td>
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- Plenary sessions follow time for served meals
- No receptions unless sponsored event
Important dates

**June 30:** Registration, Housing, and Meal Plan Ticket Sites Open

**August 25:** Student Travel Award Deadline

**September 8:** Abstract Submission Deadline

**October 10:** Early Registration Deadline

**November 1-4:** ABRCMS 2017

We need YOUR help judging poster and oral presentations. Indicate your interest during the registration process.
NIGMS is administering a Common Fund initiative - the Diversity Program Consortium
The Diversity Program Consortium takes a scientific approach to enhancing the diversity of the biomedical research workforce

- Three levels of simultaneous impact: **student**, **faculty** and **institution**
- Integration of **social science research** and **psychosocial interventions** into the process of training and mentoring students and faculty
- Rigorous **assessment and evaluation** of the training and mentoring interventions implemented across the program
The DPC: A Highly Integrated National Consortium

Coordination and Evaluation Center

Building Infrastructure Leading to Diversity

National Research Mentoring Network

Research and Service Cores
Promoting Matching and Linking Mentor Training Referring

10 DIVERSE SITES
What are some of the major issues in training?
Science has changed dramatically in the past two decades – graduate education needs to keep up.

The graph shows the percentage volume of biomedical information from 1965 to 2010, with data points for PDB, Swiss-Prot, TrEMBL, PubMed, and EMBL. The x-axis represents the years, while the y-axis shows the percentage volume. The data highlights an exponential increase in biomedical information, especially after 2000. Biochem. J. (2009) 424: 317
“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 career landscape has changed

tenure track jobs

non-tenure track faculty

non-science jobs

industry researchers

gov't researchers

non-research science jobs
Underrepresented minorities and women are leaving the biomedical academic pathway

UR, underrepresented: Hispanic, African American/Black, Native American
WR, well represented: White, Asian

TWD PD Meeting June 2017
The biomedical research community does not reflect the diversity in this country.

Available demographics from the US Census 2010:
- Native Hawaiian or Pacific Islander
- Native American or Native Alaskan
- Black or African American
- Hispanic
- Other
- Asian
- White
What is NIH doing to address these issues?
Career Preparation

BEST

PHARMA • BIOTECH
ENTREPRENEURSHIP • CONSULTING
GOVERNMENT • PUBLIC POLICY
TECHNOLOGY TRANSFER • I.P. • LAW
VENTURE CAPITAL • FINANCE
BASIC RESEARCH • TEACHING
NIH Extramural Diversity Efforts

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.
Are we seeing any changes on a national level?

After adjusting for population growth, observe a ~9x increase in the number of underrepresented minorities earning a biomedical PhD

Gibbs et al. FEATURE ARTICLE Nov 17, 2016
elife 2016;5:e21393 DOI: 10.7554/elife.21393

Are NIGMS' programs contributing to this difference?
NIGMS has been funding diversity efforts for 40 years. Are the programs working?

Undergraduate | Postbac | Graduate MS | Graduate PhD | Postdoctoral
--- | --- | --- | --- | ---
RISE | RISE | IRACDA | NRSA Fellowships
BRIDGES to BAC | PREP | BRIDGES to DOC |
MARC | 65% matriculated 63% completed PhD |
IMSD | |IMSDFocused | |
BUILD | | |
Diversity Supplement Program | Grad supported - 73% earned PhD |
T32 NRSA | K Awards |

CGS report ~50-58% URM complete PhD
A program for underrepresented minority (URM) students
Among a cohort of ~1,800 trainees from 2001-2005, 70% are enrolled in or earned a higher degree in a STEM field; 30% earned PhD (NSF data: ~2-4% of URMs earn a PhD)
Outcomes Analysis of the NIGMS Institutional Research and Academic Career Development Awards (IRACDA) Program

Posted by Dr. Andrew Miklos and Dr. Jessica Faupel-Badger on June 30, 2016
Post a Comment | View Comments (2) ↓

IRACDA outcome link

- 75% research, 25% teaching at a partner institution with a history of serving underrepresented minority students
- ~73% of IRACDA alumni are in academic faculty positions at a range of institutions types and locations
- IRACDA scholars are diverse (gender, race, ethnicity)
Looking ahead – diversity focused programs
Looking Ahead: NIGMS Diversity Training Programs

Have been asked to address issues of overlap

Need to move to T mechanisms for student support
Looking ahead
predoctoral training
Looking Ahead: Predoctoral T32
NIGMS is committed to supporting predoctoral training

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

Catalyzing the Modernization of Graduate Education

Posted by Dr. Shiva Singh, Dr. Alison Gammie and Dr. Jon Lorsch on November 30, 2015

Post a Comment | View Comments (9)

A major overhaul of how we educate graduate students in biomedical research is long overdue.

Technical | Operational | Professional

Methods & Technology | Quantitative & Computational | Acquiring Information, Experimental Design & Data Interpretation | Management & Leadership | Communication & Teamwork
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
  o Rigor & Reproducibility (26)
  o Career development (16)
  o Graduate Education - Skills (10)
Meeting Date(s):
Monday, April 11, 2016

Location:
Natcher Conference Center (Rooms E1/E2)
Bethesda, Maryland
United States

Registration Date(s):
Tuesday, February 16, 2016 to Monday, April 4, 2016

Sponsored by:
- National Institute of General Medical Sciences

- 150 participants from across the country
- 30+ posters
- >500 views on webcast (304 live)
Launching a New Predoctoral T32 FOA (MSTP to come – RFI out now)

- Consulted
  - Literature
  - Community
  - NIH Officials
  - Review
  - Council

Request for Information (RFI): Strategies for Modernizing Biomedical Graduate Education

Notice Number: NOT-GM-16-109

Give Input on Strategies for Modernizing Biomedical Graduate Education

Posted by Dr. Shiva Singh on June 9, 2016
Post a Comment | No Comments ↓
RFI Responses

- 90 unique, codable responses (most anonymous)
  - Submitted through webpage, Feedback Loop, modernPhD mailbox, direct email

- Institutions

- Individuals

- Society/advocacy groups
**NEW NIGMS-specific funding announcement**

- Emphasize trainee development.
- Focus on skills development, rigor & reproducibility, diversity & inclusion, and responsible conduct.
- Address conflicts in the incentive structure of the research enterprise.
- Encourage the use of evidence-based, innovative educational practices.
- Require the collection and dissemination of data on the success/failure of educational interventions.
- Emphasize improvements in career preparation (broadly defined) and dissemination of career outcomes on publicly available sites.

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<td>Management &amp; Leadership</td>
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<td>Communication &amp; Teamwork</td>
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Program Objective Change

The Objective of the Institutional Research Training Grant Program is to:

- **OLD**: develop and/or enhance research training opportunities for individuals interested in careers in biomedical, behavioral and clinical research that are relevant to the NIH mission. The training program should provide…. (a set of experiences)

- **NEW**: develop a diverse pool of ethical, well-trained, rigorous scientists who have ..... (a set of skills, described in the next slides)
Proposed *Trainee* Focused Objectives: Technical/Operational Skills

- Broad understanding across biomedical disciplines, and the skills to independently acquire the knowledge needed to advance their chosen field
- The ability to think critically, independently and to identify important biomedical research questions and approaches that push forward the boundaries of their area of study
Proposed *Trainee* Focused Objectives: Technical/Operational Skills

- A strong foundation in rigorous research design, experimental methods, quantitative literacy & reasoning skills, data analysis & interpretation
- Experience initiating, conducting, interpreting, and presenting rigorous and reproducible biomedical research with increasing self-direction
Proposed Trainee Focused Objectives: Professional Skills

• The ability to work effectively in teams with colleagues from diverse cultural and disciplinary backgrounds, and to promote an inclusive and supportive scientific research environment

• The skills and opportunities to communicate scientific research methodology and findings to a wide variety of audiences (e.g., discipline-specific, across disciplines, and the public)

• The knowledge, professional skills and experiences required to identify and transition into productive careers in the biomedical research workforce
Review Criteria: Overall Impact

**Overall Impact:** Reviewers will provide an overall impact score to reflect their assessment of the likelihood that the proposed training program...

**OLD**

...will prepare individuals for successful, productive scientific research careers and thereby exert a sustained influence on the research field(s) involved.

**NEW**

...through courses, structured training activities, and mentored research experiences will produce well-trained, ethical, rigorous and diverse scientists with the technical, operational, and professional skills necessary to transition into productive biomedical research careers.
Review Criteria - Training Program and Environment

Questions focused on:

OLD

- Research Environment
- Training Program Plan
- Institutional Commitment Sufficient
- Distinct from other funded programs

NEW – additional questions concerning

- Mission, Objectives, and Overall Training Plan
  - Should state measurable, obtainable objectives
- Institutional and Departmental Commitment
- Enhancements to the Training Environment
  - Evidence-based approaches to teaching, mentoring and inclusion
- Mentor Selection Process and Mentor Training
- Career Development
- Program Evaluation Plan Aligned with Objectives
Review Criteria: Principal Investigator

• **OLD**
  - Expertise, leadership and time commitment
  - Somewhat discouraging of multiple PI’s

• **NEW**
  - Expertise, leadership, *record of rigorous research*, time commitment, *trained in mentoring, diversity and inclusion*
  - Encourage multiple PI’s with complementary expertise in training
Review Criteria: Preceptors/Mentors

OLD

• Focused on numbers, funding, and scientific expertise

NEW

• Numbers, funding and expertise
• Bandwidth and commitment to training
• Must provide research opportunities and teach: experimental design, rigor & reproducibility
• Trained mentors
• Commitment to diversity and a supportive research environment
• Actively promote career development
Review Criteria: Trainees

**OLD**

- Mostly whether there are sufficient numbers of “well-qualified” students
- Must have an appointment plan

**NEW**

- Encourages recruiting and appointing trainees from diverse backgrounds (broadly defined) with the potential to become outstanding scientists (e.g., a holistic review process when accepting and appointing students)
- Emphasizes a retention plan with oversight throughout the entire time in graduate training
Review Criteria: Training Record

OLD
- Completion
- Research accomplishments: (e.g., “high-impact” publications, awards, careers in research, leadership positions)
- Evaluations

NEW
- Completion and time to degree (well- vs under-represented similar)
- Demonstrate rigorous research activity that advanced scientific knowledge and/or technologies (e.g., peer-reviewed papers, presentations at scientific meetings, etc.)
- Plans for career tracking
- Recruitment plans for students from underrepresented groups
- Evaluation, outcomes, and dissemination plans; responsive improvements
- Recruitment plans for diversifying the faculty
Timeline

• **NIH Guide publication:** September 2017 (estimated)
• **Application receipt:** May 2018
• **Initial review:** Oct/Nov 2018
• **NAGMS Council review:** January 2019
• **Earliest award date:** July 2019
White paper coming in July

Future Of Bioscience Graduate And Postdoctoral Training Conference, Part 2
Upcoming meetings and workshops
MSTP Request for Information

Give Input on Strategies to Enhance Physician-Scientist Training Through the Medical Scientist Training Program

Posted by Dr. Shiva Singh, Dr. Stefan Maas and Dr. Jessica Faupel-Badger on June 14, 2017

Post a Comment | No Comments ↓

Notice Number: NOT-GM-17-009

Key Dates

Release Date: June 9, 2017
Response Date: August 9, 2017
Looking Ahead:
Postdoctoral Training
Research: Decoupling of the minority PhD talent pool and assistant professor hiring in medical school basic science departments in the US

Kenneth D Gibbs Jr, Jacob Basson, Imam M Xierali, David A Broniatowski

National Institute of General Medical Sciences, United States; Association of American Medical Colleges, United States; The George Washington University, United States
NIGMS Diversity-Related Trainee Slots - We could be doing more in the postdoc to faculty space.
TWD Program Directors’ Meeting Goals

• Exchange Training Ideas and Innovations

• Network

• Strengthen Communication with NIH (TWD Listens)

• Develop skills to articulate training goals and evaluate interventions/activities