NIH Addresses the Science of Diversity: Focusing on Institutional Change

Hannah A. Valantine, MD
NIH Chief Officer for Scientific Workforce Diversity

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NIH Addresses the Science of Diversity

Presentation Outline

• Why diversity matters
• Keys to scientific workforce diversity
• Moving beyond individual-level diversity strategies
• Sustainability requires institutional-focused efforts
Why Diversity Matters
Capitalizing on the Opportunity

Global Research Preeminence

Changing Demographics
- Broadening Scope of Inquiry
  - Health Disparities
  - Sex/Gender

Excellence, Creativity, Innovation
Capturing the Benefits of Diversity
Identity is a Proxy for Cognitive Diversity

*Underrepresented Populations in U.S. Biomedical, Clinical, Behavioral and Social Science Research
URM Diversity Declines Along Career Path

- **Associates**
  - Women - Underrepresented
  - Women - Well-represented
  - Men - Underrepresented
  - Men - Well-represented

- **Bachelors**
  - Women - Underrepresented
  - Women - Well-represented
  - Men - Underrepresented
  - Men - Well-represented

- **Masters**
  - Women - Underrepresented
  - Women - Well-represented
  - Men - Underrepresented
  - Men - Well-represented

- **Doctoral**
  - Women - Underrepresented
  - Women - Well-represented
  - Men - Underrepresented
  - Men - Well-represented

- **Lecturer/Instructor**
  - Women - Underrepresented
  - Women - Well-represented
  - Men - Underrepresented
  - Men - Well-represented

- **Assistant Professor**
  - Women - Underrepresented
  - Women - Well-represented
  - Men - Underrepresented
  - Men - Well-represented

- **Associate Professor**
  - Women - Underrepresented
  - Women - Well-represented
  - Men - Underrepresented
  - Men - Well-represented

- **Full Professor**
  - Women - Underrepresented
  - Women - Well-represented
  - Men - Underrepresented
  - Men - Well-represented

**Training**
- Women - Underrepresented
- Women - Well-represented
- Men - Underrepresented
- Men - Well-represented

**Early Career**

**Tenured Faculty**
Gender Diversity Declines Along Career Path

At the current rate, attaining gender parity will take a very long time (48 years nationwide)

We need accountability – Disaggregate the data!

**Internal Medicine, Pathology, Neurology, Pediatrics, Psychiatry, Surgery, Radiology

Sources: AAMC, 2015 Faculty Roster Table 13; AAMC, The State of Women in Academic Medicine: The Pipeline and Pathways to Leadership, 2015-2016, Table 11
Diversity Science

Keys to Scientific Workforce Diversity

DIVERSITY PROGRAM CONSORTIUM

Supported by the National Institutes of Health

Recruitment Retention

Sociocultural Factors

Sustainability

Valantine and Collins. PNAS 2015: Oct 6;112:12240-2
Diversity Improves Quality of Science

- 2.57 million scientific papers between 1985-2008 (authors with U.S. addresses); 11 scientific fields
- Surnames of co-authors – ethnic diversity
- Controlled for # authors; population density etc.

**Papers written by a diverse groups:**
- Receive more citations
- Published in journals with higher impact factors

- Similar finding for gender diversity*


**Diversity Science**

*The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools, and Societies*
Scott E. Page

**Sociocultural Factors**

**Recruitment Retention**

**Sustainability**

NIH Diversity Program Consortium

Building Evidence- Awards made October 2014
Total: $250 million (5 years)

BUILD: 10 sites/experiments

NRMN

CEC

BUILD Tested Interventions

- Stereotype threat
- Critical race theory
- Student entrepreneurship
- Living and learning communities

NRMN Activities

- Guided virtual mentorships
- MyNRMN tool
- Mentors: 2,066*
- Mentees: 3,844 *
- Grantwriting/coaching - mentees: 456 (July ’17)

Hispanic-Serving Institutions
Historically Black Colleges and Universities
State Colleges
Public Universities

Total of 10 Sites/Experiments

*Data as of September 2017
BUILD TL4 Participant Demographics (Total: 683)

- Hispanic: 41% (280)
- White: 12% (84)
- Black: 27% (184)
- Asian: 12% (82)
- AI/AN/PI/MR: 6% (40)
- Unknown / Withheld: 2% (13)
BUILD Dashboard (Years 1-3)

Student

- BUILD NRSA training slots (TL4)*: 1329
- BUILD research training slots (RL5): 786
- Student Seminars/ Workshops: 364
- Faculty Release Time (# participants): 248
- Faculty Mentor Training (# activities): 91
- Pilot Projects: 98
- Faculty Professional Development (# activities): 88
- Novel Curricula: 104
- Institutional Partner Agreements: 88
- Publications: 85

Faculty

* Students supported for multiple years

Updated December 2017
BUILD: Testable Interventions

Impact on pre-defined outcomes of:

Site-Specific

- Reducing stereotype threat
- Diminishing imposter syndrome
- Overcoming microaggressions
- Mitigating unconscious bias
- Increasing cultural awareness and sensitivity
- Emphasizing cultural assets
- Engaging family and support systems

Consortium-Wide

- Science identity
- Providing financial assistance
- Providing authentic research experiences
- Implementing active learning courses
- Forming supportive cohorts and learning communities
- Mentor training
- Creating professional networks
SF State University
Stereotype Threat Intervention

**STEP Intervention:** Addressing stereotype threat, affirming underrepresented students’ values, improving sense of belonging, and building science identity

**Course Grades**

- URM
- Non-URM

**Abstract Reasoning**

- URM
- Non-URM

**Resilience**

- Baseline Threat
- Values Affirmation
- STEP

_Education Sciences 2017_, 7(2), 65; doi: [10.3390/educsci7020065](https://doi.org/10.3390/educsci7020065)
Faculty-Focused Interventions

Certain interventions increase self-efficacy and research success:

• Rigorous pilot-project funding process
• Protected time for research
• Grant-writing workshops
• Grant-writing coaches

Surveys of self-efficacy

Hallmarks of success: presentations at meetings, publications, external funding
NRMN Grant-Writing Participants
N=432

- Black: 34%
- White: 22%
- Hispanic: 19%
- Asian: 13%
- Hawaiian/Pacific Islander: 1%
- American Indian/Alaska Native: 5%
- Multiracial: 4%
- Other: 2%
- Other: 2%

NRMN Grant - Writing Participants
N=432
Coordination and Evaluation Center (CEC) Student Activity Tracking Tool

- Individuals tracked by their activities and linked to outcomes
- Data is tracked in the same way
- Stores all data in one location
- Ensures data will be accessible in future years

Example of Tracking Data

- Mentoring, 800
- Career Development, 1400
- Novel Curricula, 1010
- BUILD Financial Support, 284
- Diversity Training, 46
- Research Training & Support, 1500
- Academic Advising & Support, 1750
<table>
<thead>
<tr>
<th>Diversity Science</th>
<th>Recruitment Retention</th>
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</thead>
<tbody>
<tr>
<td>Sociocultural Factors</td>
<td>Sustainability</td>
</tr>
<tr>
<td>Stereotypes Bias</td>
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Study: “Who is a Scientist?”

Study: “Who is a Scientist?”

Feminine women: Judged Less Likely to “be a Scientist”
Implicit Bias Intervention: Women in Scientific Leadership

- Hypothesis: a standardized, 20-minute educational intervention will educate faculty about implicit biases and help overcome them.
- Measured pre- and post-IAT test and collected demographic data.

Results of Intervention:
- Changed perception of implicit bias in males and females.
- Reduced implicit bias about leadership and men.

NIH Scientific Workforce Diversity

What are we doing to help?

Interventions at Individual Level

Intramural

- Recruitment Strategies and Tools: NIH SWD Interactive Toolkit
- Retention strategies: NIH Central Equity Committee
- Graduate Student Diversity

Extramural

- BUILD, NRMN, CEC
- Diversity Supplements
- Eliminate R01 funding disparities
  - Next Generation Scientist
  - Peer Review Bias Study
- Sustain and Scale
  - Hubs of Innovation
Keys to Scientific Workforce Diversity

Diversity Science

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Sustainability Institutional Accountability

Valantine and Collins. PNAS 2015: Oct 6;112:12240-2
NIH Scientific Workforce Diversity

What are we doing to help?

Interventions at \textit{Individual} Level

Intervention at \textit{Institutional} Level
Institutional Leadership: Promotes Diversity and Inclusion

Three Pillars of Culture
Institutional Transformation and Culture Change

Programs are necessary but not sufficient:

Promote Transparency and Accountability

Link to Institutional Values and Reward Systems

- Systematic review and transparency of hiring and promotion procedures, policies
- Transparency: collect and publicize aggregate diversity metrics
- Provide tools to Divisions, Departments for enhancing recruitment and retention
- Evaluation of impact
Institutional Leadership Drives Culture Change

Endorse Value

Resources Money, Time

Flexibility

Climate

Tools for Recruitment & Retention

Mentoring

Bias Mitigation

Sexual Harassment

Work-Life

Institutional Leadership Drives Culture Change

Transparency & Accountability

Sponsorship: Awards, Positions

Salary/ Resources

Diversity Data
URM Assistant Professors: Lags Behind Growth in Ph.D. Recipients

Gibbs, K. D., et al. (2016). *Decoupling the minority PhD talent pool and assistant professor hiring in the medical school basic science departments in the US.*
Increase in URM PhD Recipients (1996-2015)

NSF Survey of Earned Doctorates 1996-2015. Fields included: Biological Sciences (53%), Medical Chemistry (19.2%), Sciences (7.5%), Other Life Sciences (5.2%), Psychology (14.7%)
Eliminate Transition Gaps: Enhance Faculty Diversity

- Postdoc -> faculty/other research careers
  - Needed: Program linkages across career stages
- Draw evidence from existing programs
  - Integrated approaches
  - Sociocultural factors

**Goal**: Eliminate transition barriers > achieve sustainable transformation in scientific workforce diversity
Addressing Racial R01 Funding Gap

Intervention Targets

Submissions
- Institution
- Topic

Review
- Less discussed
- Score
- Fewer re-submissions
- Topic

Funding
- IC Council review
- Paylines, select pay
- Topic

Mentoring/coaching pilot to enhance submission and re-submission

Information on re-submission outreach
- Anonymized application review study

IC select pay analysis
- Topic further analyses
  - Health disparities
  - Minority health

Spring 2018
Underway
Top Research Institutions:
Women in Senior Academic Rank 2015

National Average (Tenured) = 23%

Sources: TABLE 7: 2015 BENCHMARKING—FULL-TIME FACULTY BY GENDER, RANK, AND TENURE AAMC Faculty Roster, December 31, 2015 snapshot; NIH Office of Intramural Research
Addressing Gender Inequality in the NIH IRP Action Task Force: Recommendations

Institutional Culture Change

Institution-focused

1. Leadership commitment for hiring and promotion
2. Transparency in resources and salary: tracking, reporting, accountability

Individual-focused

1. Provide support, mentoring, coaching, sponsorship
2. Address inclusion and belonging

Apply to all underrepresented groups
## Equity Metrics for Annual Evaluation

<table>
<thead>
<tr>
<th>Tenured and tenure-track investigators analyzed separately</th>
<th>Efforts to promote diversity, equity, inclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Demographic data,</td>
<td>- Diversity of speakers at seminars hosted by the IC</td>
</tr>
<tr>
<td>- Salaries, resources for hiring</td>
<td>- Promote awareness of implicit bias</td>
</tr>
<tr>
<td></td>
<td>- Best practices for search committees and outreach</td>
</tr>
<tr>
<td></td>
<td>- Award nominations</td>
</tr>
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<thead>
<tr>
<th>Equity of review practices</th>
<th>Goals for the coming year</th>
</tr>
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<tbody>
<tr>
<td>- BSC and ad hoc reviewers, promotion, and tenure committees</td>
<td>- Input on how OIR and OWSD can support the ICs</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Efforts to correct identified inequities</th>
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</table>
Best Practices to Enhance Faculty Diversity
Taking Bias out of the Hiring Process

- Use tools to identify candidates from diverse backgrounds
- Recruitment begins before position available
- Job descriptions might influence who apply
- Ask colleagues for female and minority candidates

- Diverse perspectives & background: Committee
- Criteria before applicant evaluation
- Adequate time for evaluation: Stereotyping
- Articulate the reasons for decisions
- Structured interviews
Institutional Leadership Drives Culture Change

- Endorse value
- Flexibility
- Resources $, time
- Climate
- Work-Life
- Equity
- Sponsorship: awards, positions
- Salary/resource equity
- Understand diversity data
- Mentoring
- Tools for Recruitment & Retention
- Sexual Harassment
- Bias Mitigation
NIH Scientific Workforce Diversity Toolkit

The U.S. scientific research enterprise – from basic laboratory research to clinical and translational research to policy – requires intellect, creativity, and diverse skill sets and viewpoints.

Diversity
... enhances excellence, creativity, and innovation
... broadens the scope of biomedical inquiry
... addresses health disparities
... ensures fairness in our highly diverse nation

- Recruitment search protocol
- Tips for reducing implicit bias
- Future Research Leaders Conference
Enhancing Diversity in Candidate Pool

Early Stage Investigators

Post-Doctoral and Assistant Professors

Race/Ethnicity

- White/Caucasian: 24%
- African-American/Black: 14%
- Hispanic/Latino: 30%
- Native American: 6%
- Asian: 1%
- Other: 25%

Gender

- Female: 44%
- Male: 56%

~ 693 total, top 1/3rd culled
4-10 years post-doctorate (most 4-7)

Authorship in top journals

- 10+ publications: 369
- 100+ citations: 490
- 200+ citations: 367
Enhancing Diversity in Candidate Pool

Mid - Late Career Stage

Associate Professors and Full Professors

Race/Ethnicity

- White/Caucasian: 55%
- African-American/Black: 13%
- Hispanic/Latino: 7%
- Native American: 2%
- Asian: 1%
- Other: 22%

Gender

- Female: 52%
- Male: 48%

> 706 total, top 1/2 culled
Authorship in top journals
100+ publications: 291
500+ citations: 586
2000+ citations: 414
Gender Diversity Declines Along Career Path

Many reasons:
✓ Unappealing characteristics of academic/research careers
✓ Stereotypes and biases
✓ Marginalization
✓ Work-life balance and childcare
✓ Mentoring
✓ High job turnover

Sexual Harassment?

https://www.aamc.org/download/475530/data/16table13.pdf (Faculty, 2016)
Sexual Harassment in Science

The shifting tide of sexual harassment in science - The Washington Post
https://www.washingtonpost.com/...science/...the-shifting-tide-of-s...
The Washington Post
Feb 10, 2016 - We know it happens, and far too often: Young women in academia – especially in scientific fields – face sexual harassment that can range from ...

She Wanted to Do Her Research. He Wanted to Talk 'Feelings.' - The...
www.nytimes.com/...she-wanted-to-do-her-research-he-wanted-to...
The New York Times
Mar 4, 2016 - Sexual harassment in science generally starts like this: A woman (she is a student, a technician, a professor) gets an email and notices that the ...

Addressing sexual harassment in science | Big Think
bigthink.com/world-in-mind/addressing-sexual-harassment-in-science
Big Think
Addressing sexual harassment in science, by Kayt Sukel. Over a year ago. The stories come in surprising ways. An unexpected confession over a meal or a few ...

sexual harassment | Tenure, She Wrote
https://tenurebashwrote.wordpress.com/tag/sexual-harassment/
Feb 28, 2016 - Posts about sexual harassment written by Guest Blogger, ... raised by some was a need to keep the science separates from the behaviour, and ...

The sexual misconduct case that has rocked anthropology | Science ...
www.sciencemag.org/news/...sexual-misconduct-case-has-rocked-antropolo...
Science
Feb 9, 2016 - Although the most recent high-profile cases of sexual harassment in science have arisen in astronomy and biology, many researchers say ...

Anthropologists say no to sexual harassment | Science | AAAS
Apr 29, 2016 - An emotionally charged session on sexual harassment in anthropology ... when she participated in an otherwise all-male scientific workshop.

Persistent Sexual Harassment Is a Primary Reason Women Leave ...
jezebel.com/persistent-sexual-harassment-is-a-primary-reason-women-176326...
Jezebel
Mar 2, 2016 - Sexual harassment in science apparently starts like this: A woman (she is a student, a
“… when a female scientist becomes a faculty member, she finds herself invested in every system that is doing the weeding, and soon recognizes that sexual harassment is one of the sharpest tools in the shed.”
Severity Among Women With K08 and K23 Awards Who Reported Having Experienced Harassment (n = 150)

<table>
<thead>
<tr>
<th>Experience</th>
<th>Respondents, No. (%) [95% CI]a</th>
</tr>
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<tbody>
<tr>
<td>Sexist remarks or behavior</td>
<td>138 (92.0) [86.4-95.8]</td>
</tr>
<tr>
<td>Unwanted sexual advances</td>
<td>62 (41.3) [33.4-49.7]</td>
</tr>
<tr>
<td>Subtle bribery to engage in sexual behavior</td>
<td>9 (6.0) [2.8-11.1]</td>
</tr>
<tr>
<td>Threats to engage in sexual behavior</td>
<td>2 (1.3) [0.2-4.7]</td>
</tr>
<tr>
<td>Coercive advances</td>
<td>14 (9.3) [5.2-15.2]</td>
</tr>
</tbody>
</table>

a Totals sum to more than 100% because respondents were asked to indicate all that applied.
NIH Initial Response

NIH has pledged to "identify the steps necessary to end this [sexual harassment] in all NIH-supported research workplaces and scientific meetings."

"An important first step will be to gather as much data as possible to more fully understand the nature and extent of sexual harassment among scientists."

nature
bit.ly/NIHharassment
Sexual Harassment Prevention Plan Components

- Agency policy for Manual Chapters
- Awareness of policy and harassment prevention plan
  - Education and communication plan
- Sexual harassment hotline (reporting)
- Trans-NIH committee to recommend disciplinary action
- Mandatory sexual harassment training
- NIH sexual harassment survey

Constructed with a trans-NIH group
Institutional Leadership Drives Culture Change

- Endorse Value
- Flexibility
- Resources (Money, Time)

Climate

- Tools for Recruitment & Retention
- Mentoring
- Bias Mitigation
- Sexual Harassment

Work-Life

Equity

- Sponsorship: Awards, Positions
- Salary/Resources
- Understand Diversity Data
Average Age of First-Time Investigators on R01 Grants is Increasing

- Average Age (Years)
- MD-PhD
- MD Only
- PhD Only

NIH Next Generation Scientist Program
“...runs in our family. My father and grandfather are also working as postdocs.”
“Time in the bank: A Stanford plan to save doctors from burnout”

Faculty career flexibility is more about culture than about policies

Culture >> Policies!

Science of Diversity

Diversity Leads to Innovation

LEARN MORE

Science of Diversity
Building Evidence
Sociocultural Factors
Sustaining Diversity

diversity.nih.gov
Great minds think differently ...

@NIH_COSWD