Diversity matters at NIH because...
Diversity leads to better problem-solving

“I stumbled on a counterintuitive finding ... Diverse groups of problem solvers—groups of people with diverse tools—consistently outperformed groups of the best and the brightest. If I formed two groups, one random (and therefore diverse) and one consisting of the best individual performers, the first group almost always did better. In my model, diversity trumped ability.”

- Scott Page

Bui, Q. (2015, August 7). 17,205 People guessed the weight of a cow. Here’s how they did. NPR, Retrieved from http://www.npr.org/sections/money/2015/08/07/429720443/17205 people guessed the weight of a cow here's how they did

Research conducted by diverse teams is cited more often and is published in more prestigious journals.


NIH can play a leading role in reducing bias and improving opportunities for everyone by developing and modeling effective strategies for increasing diversity.
Bias is pervasive …

“Black name applicants in our study received about 14 percent lower call-back rates than otherwise identical white applicants.”

“… she became the third new mum to retain Olympic gold” … “asked how she cares for her skin and how training affects her hair.”

Recommendation letters for men:
Longer; More references to CV, publications, patients, colleagues
In SCIENCE

SOCIOCULTURAL FACTORS
Bias shapes who we think is a scientist, how qualified a scientist is perceived to be, and how likely someone is to be hired or promoted.
Who is a scientist?

- Pictures of actual faculty members in Science, Technology, Engineering, and Math (STEM) at elite universities
- Rated for masculinity and femininity
- Separate group of students rated pictures for likelihood of being a scientist

All of them are

In a 2016 study, students who saw these pictures of STEM faculty members were more likely to assume that the feminine-looking women were early childhood educators. For males, appearance made no difference.

Bias shapes hiring decisions and perceptions of competence.
When asked to evaluate applications for a lab manager position... biology, chemistry, and physics professors across the country rated the sample female candidate:

- less competent
- less hirable
- offered less mentoring
- $3,700 less salary than an identical application with a male name

However, research shows that interventions can reduce bias.
NIH is pioneering and testing new approaches to promoting scientific workforce diversity by...
Leading the Diversity Program Consortium (DPC)

A national collaborative effort to develop and test interventions to promote diversity in the biomedical sciences

Developing interventions that provide underrepresented students and faculty mentoring, research training, and professional development through...

BUILD
Building Infrastructure Leading to Diversity

Targeting 3 Levels at once
- Students
- Faculty
- Institution

Taking a scientific approach to interventions
NIH Diversity Program Consortium (DPC)

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

BUILD: 10 sites/experiments
NRMN
CEC

Building Evidence Leading to Diversity (BUILD) - 2,400* students have participated to date
• California State University Long Beach
• California State University Northridge
• Morgan State University
• Portland State University
• San Francisco State University
• University of Alaska Fairbanks
• University of Detroit Mercy
• University of Maryland Baltimore County
• University of Texas El Paso
• Xavier University of Louisiana

National Research Mentoring Network (NRMN)
• Boston College
  – Morehouse SM; U. Utah; U. North Texas; U. Wisconsin

Coordination and Evaluation Center (CEC)
• University of California Los Angeles

DPC Website: www.nigms.nih.gov/training/doc/dpc/default.aspx

NIH Diversity Program Consortium  
(Cont.)

**BUILD Tested Interventions**

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

**NRMN Activities**

- Guided virtual mentorships
- MyNRMN tool
- Mentors: 1,929* (June ‘17)
- Mentees: 3,574* (June ‘17)
- Grantwriting/coaching - mentees: 351** (February ‘17)

**Hispanic-Serving Institutions**

<table>
<thead>
<tr>
<th>State Colleges</th>
<th>Public Universities</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Historically Black Colleges and Universities</th>
</tr>
</thead>
</table>

Total of 10 BUILD Sites/Experiments

## BUILD Training Linked (TL4) Grant Award Participant Demographics (Total: 683)

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Percentage</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>12%</td>
<td>84</td>
</tr>
<tr>
<td>Black</td>
<td>27%</td>
<td>184</td>
</tr>
<tr>
<td>Asian</td>
<td>12%</td>
<td>82</td>
</tr>
<tr>
<td>AI/AN/PI/MR</td>
<td>6%</td>
<td>40</td>
</tr>
<tr>
<td>Hispanic</td>
<td>41%</td>
<td>280</td>
</tr>
<tr>
<td>Unknown/Withheld</td>
<td>2%</td>
<td>13</td>
</tr>
</tbody>
</table>

*AI/AN/PI/MR = American Indian/Alaskan Native/Pacific Islander/Multiple Races*
BUILD Dashboard (Years 1-3)
Intermediate Data

- 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

*NRSA = National Research Service Awards

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
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

Photos courtesy of University of Maryland, Baltimore County STEM BUILD, an NRMN Fellows Program, and California State University, Long Beach, CSULB BUILD

https://nrmnet.net/build/
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

<table>
<thead>
<tr>
<th>Student Activity</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mentoring</td>
<td>800</td>
</tr>
<tr>
<td>Novel Curricula</td>
<td>1010</td>
</tr>
<tr>
<td>BUILD Financial Support</td>
<td>284</td>
</tr>
<tr>
<td>Diversity Training</td>
<td>46</td>
</tr>
<tr>
<td>Research Training &amp; Support</td>
<td>1500</td>
</tr>
<tr>
<td>Academic Advising &amp; Support</td>
<td>1750</td>
</tr>
<tr>
<td>Career Development</td>
<td>1400</td>
</tr>
</tbody>
</table>

https://bmcproc.biomedcentral.com/articles/10.1186/s12919-017-0082-9
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-Implicit Association Test and collected demographic data

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

Significant effect of gender: **p=0.001; significant effect of the intervention: p=0.02

A study conducted in 92 departments at the University of Wisconsin found that faculty who underwent a 2.5 hour intervention...

- were more aware of bias
- showed greater motivation to promote gender equity
- considered it personally beneficial to promote gender equity

Studying R01 grant funding disparities at NIH
Building Evidence

% of Scientists Who Submitted and Were Awarded an NIH R01 Grant by Race 2010-2015

- White: 17%
- Black: 11%

Black Scientists Are Only 1.5% Total NIH R01 Applicant Pool

Black Scientists
- Less likely to apply or re-apply for an NIH R01 grant
- Have fewer applications discussed by study sections
- Have fewer grants funded

NIH Addresses the Disparity
- Mentoring and coaching to increase submission & re-submission
- Information outreach about funding benefit of trying again
- Peer review anonymous bias study

Cumulative Disparity Spans Submission to Funding

- Black scientists are a tiny fraction (1.5%) of the applicant pool and are less likely to apply or re-apply for NIH R01 grant.
- Grant applications from Black scientists are given lower scores and are less likely to be discussed by reviewers, compared to whites.
- Topics that many Black scientists prefer to study are less likely to be funded.

Great Minds Think Differently
NIH has invested heavily at the predoctoral level to increase workforce diversity. We lose underrepresented populations at the transition to career independence.

Underrepresented Minority Diversity Declines Along Career Path

Improving the NIH Intramural Research Program support initiatives by identifying gaps that contribute to disparities.

**GSOAR** = Graduate Summer Opportunities to Advance Research/GPP = Graduate Partnership Programs

**CCSEP** = Community College Summer Enrichment Program
Hosting the Future Research Leaders Conference to bring smart, diverse talent to the NIH campus to learn about research and career opportunities.
Developing interdisciplinary partnerships to identify, research, and mitigate barriers to career development for underrepresented groups.
We study and promote diversity in the scientific workforce because…
Great minds think differently ... 

@NIH_COSWD