NIH Scientific Workforce Diversity Progress Report and Recommendations
ACD Diversity Working Group

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NIH Chief Officer for Scientific Workforce Diversity

114th NIH ACD Meeting | June 8, 2017
NIH Scientific Workforce Diversity: Progress Report and New Recommendations

Presentation Outline

• Review of progress on 2012 ACD recommendations
• Three clustered areas
  – NIH Institutional Oversight and Support
  – Mentoring, Career Development, Recruitment, Retention
  – Research and Interventions
• Where are we now? Demographic data
• Proposed new 2017 ACD recommendations
13 Recommendations from the 2012 Report of the ACD WGDBRW

NIH Institutional Support and Oversight Recommendations
- Chief Officer for Scientific Workforce Diversity
- ACD Working Group on Diversity
- Tracking and Evaluation

Mentoring, Career Development, Recruitment, Retention
- Support for Underserved Institutions
- Mentoring Networks
- Undergraduate Scholarships
- IRP Diversity
- K-12 Support

Research and Intervention Recommendations
- Review Feedback for All Applications
- Racial Funding Disparity
- Peer Review Working Group
- Bias Education
- Anonymous Bias Study
NIH Institutional Oversight and Support

• Chief Officer for Scientific Workforce Diversity (COSWD)
  – Mission: **NIH leads and catalyzes scientific workforce diversity through data-driven innovations to recruit and retain the most talented scientists**
  – Strategic goals
  – Extramural and intramural implementation plans
  – Communication plan: Newsletter; blogs; website
  – [diversity.nih.gov](http://diversity.nih.gov)

• ACD WG on Diversity
  – Progress to date and new recommendations

• NIH Steering Committee Diversity Working Group
  – Evaluation, tracking
NIH Institutional Oversight and Support Tracking and Evaluation

• Evaluation – retrospective
  – Diversity administrative supplements
  – IC-specific diversity programs
    • NIGMS - RISE, MARC, IMSD
    • NCI - CURES
    • NIAID - INRO

• Evaluation – prospective
  – Center for Evaluation and Coordination (CEC) as a model:
    – BUILD; NRMN

• Tracking
  – Electronic submission (Diversity supplements; Progress Reports)
  – Monitoring through eRA Commons ID
  – ORCID ID
Mentoring, Career Development, Recruitment, Retention: Building Infrastructure Leading to Diversity (BUILD)

Awards made October 2014
BUILD: 10 sites/experiments
NRMN
CEC
Total: $250 million (5 years)

BUILD
- 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. Min.; U. North Texas; U. Wisconsin

Coordination and Evaluation Center (CEC)
University of California Los Angeles
Scientific Approach to Enhancing the Diversity of the Biomedical Research Workforce

- BUILD: 10 experiments each with:
  - Hypothesis
  - Intervention and control groups
  - BUILD vs Non-BUILD institutions

- Three levels of impact: student, faculty, and institution

- Integration of social science research and psychosocial interventions into the process of training and mentoring

- Rigorous assessment and evaluation of the training and mentoring interventions implemented across the program
  - Hallmarks and metrics of success
BUILD: “Clinical Trial” Model of Investigation

**Independent Variables**
- Gender
- Race/Ethnicity
- Disability Status
- Socio-economic Status
- Institutional Factors
- Test Scores
- Major
- GPA

**Activities or Interventions**
- Financial Support
- Academic Advising & Support
- Research Training & Support
- Novel Curricula
- Mentoring
- Diversity Training
- Career Development

**Short to Medium-Term Outcomes**
- Engagement in Research
- Enhanced Self-Efficacy & Science Identity
- Pursuit & Persistence in Biomedical Science Disciplines
- Scientific Presentations and Authorship of Manuscripts
- Social Integration
- Satisfaction with Faculty Mentorship
- Intent to Pursue Biomedical Research Career

**Medium to Long-Term Outcomes**
- Completion of Undergraduate Degree in Biomedical Science
- Evidence of Biomedical Career Preparedness
- Application & Acceptance to Graduate Programs
- Research Fellowships & Scholarships
Consortium-Wide Evaluation Design:
*BUILD; BUILD vs non-BUILD Institutions

Prior to BUILD (HERI)
- Grantee institution
  - non-BUILD

Time 1
- Grantee institution
  - BUILD
  - non-BUILD

Times 2, 3, ...
- Grantee institution
  - BUILD
  - non-BUILD

*Intervention vs control groups within BUILD institutions

HERI: HIGHER EDUCATION RESEARCH INSTITUTE
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
Example: Site-specific Intervention

Stereotype Threat

• Social contextual phenomenon that occurs when environmental signals and being in the numerical minority elicit worries that one’s actions will reinforce negative stereotypes about one’s race/ethnicity, leading to underperformance — “Cognitive tax”

• ST is a stronger predictor for URM early exit from STEM majors than lack of academic preparation
BUILD Experiment on Stereotype Threat (ST)  
San Francisco State University

- Speaking Truth to EmPower (STEP)
- Hypothesis: STEP will protect URMs’ intellectual performance from ST and bolster URMs’ intellectual safety
- Randomized controlled trial, 3 conditions (URM, non-URM for each)
  - 1. Baseline threat (control)
  - 2. Values affirmation (“standard of care”):
    - Focus, reflect, and write about positive life factors: friends, family, personal interests
  - 3. STEP intervention
    - Combines knowledge (tutorial) and actions (imagine individualized ST “lived experiences” and plan what to do)
Results: BUILD Experiment on Stereotype Threat

Example: Consortium-wide Student-Focused Intervention

A strong science identity leads to persistence in science - certain activities and interventions increase science identity:

- A research-infused curriculum
- Engagement in laboratory research
- Presentations of research findings
- Understanding and overcoming the psychosocial barriers to feeling a sense of belonging in the scientific community (site-specific)
Measuring Science Identity

Survey Items

- “I have a strong sense of belonging to a community of scientists”
- “I derive great personal satisfaction from working on a team that is doing important research”
- “I think of myself as a scientist”
- “I feel like I belong in the field of science”

Answer scale: 1=strongly disagree, 5=strongly agree

Short-Term: Exposure to BUILD activities will result in stronger “science identity”

Longer-Term: Stronger science identity will in turn predict (a) persistence in biomedical major, (b) graduation with biomedical bachelors degree and (c) matriculation to graduate school in biomedical science

Science Identity STEM Freshmen by Race/Ethnicity – BUILD vs non-BUILD Institutions

Incoming Freshmen*

Freshmen - End of Year*

* Source Data:
Incoming Freshmen: From Fall 2016 HERI
Freshmen End of Year: From Spring 2016 HERI
National Comparison = same non-BUILD institutions Fall & Spring
Recruitment/Enrollment* of BUILD Student Participants - Cohorts 2015-2019

Some Data Trends..............
Race and Ethnicity of Consortium-Wide Evaluation
Student Participants: BUILD Institutions

- White: 25%
- White & Latino: 4%
- Latino: 16%
- Black: 26%
- Asian/PI: 17%
- Native American/Alaska Native: 0.4%
- Other: 2%
- Two or More Ethnicities: 10%

Note: Based on first cohort of freshmen in 2015
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
- Mentee: 1400
- Novel Curricula: 1010
- BUILD Financial Support: 284
- Diversity Training: 46
- Research Training & Support: 1500
- Academic Advising & Support: 1750

Mentor
Mentee
Participants

Student Activity
Example: Faculty Focused Hypothesis

Certain interventions contribute to increased self-efficacy, resulting in improvements in research-related success

Interventions include:

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

Surveys address self-efficacy

Hallmarks include: presentations at meetings, publications, external funding

Race/ethnicity of trainees who submitted grant applications post-NRMN training (as of March 24, 2017), N = 66
Race/ethnicity of trainees who submitted grant applications post-NRMN training (as of March 24, 2017), N = 66

- Black: 37%
- White Non-Hispanic: 21%
- Hispanic-White**: 19%
- Hispanic-Other**: 3%
- Asian: 7%
- American Indian/Alaska Native: 7%
- Hawaiian Pacific Islander: 2%
- Not Reporting: 1%
- Unknown: 3%
NRMNet Registrant Race and Ethnicity (6/1/17)

Mentees: N = 3,574

- White: 31%
- Black: 26%
- Hispanic: 21%
- Asian: 14%
- Multiracial: 3%
- Other: 2%
- Hawaiian/Pacific Islander: 1%
- American Indian: 2%

Mentors: N = 1,929

- White: 48%
- Black: 16%
- Hispanic: 18%
- Asian: 13%
- Multiracial: 2%
- Other: 1%
- Hawaiian/Pacific Islander: 0%
- American Indian: 2%
Targeted Recruiting and Retention: Enhancing NIH Intramural Diversity

- Scientific opportunities in the intramural research program (IRP)
- Underrepresentation: Pipeline, attrition
  - Women
  - Race/ethnicity
- Enhancing diversity in the IRP – SWD partnership
  - Recruitment and retention of tenure-track scientists
  - SWD tools
  - Implicit bias education
Expanding Diversity of Candidate Pools:

**Junior Career Stage**

*Postdoctorates and Assistant Professors*

- ~667 total, top 1/3rd culled
- 4-10 years post-doctorate (most 4-7)
- Authorship in top journals
- 10+ publications: 357
- 100+ citations: 407
- 200+ citations: 311

### Race/Ethnicity

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<th>Race/Ethnicity</th>
<th>Percentage</th>
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<tr>
<td>White/Caucasian</td>
<td>23%</td>
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<tr>
<td>African-American/Black</td>
<td>15%</td>
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<tr>
<td>Hispanic/Latino</td>
<td>5%</td>
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<tr>
<td>Native American</td>
<td>31%</td>
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<tr>
<td>Asian</td>
<td>25%</td>
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<tr>
<td>Other</td>
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### Gender

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<tr>
<th>Gender</th>
<th>Percentage</th>
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<tr>
<td>Female</td>
<td>52%</td>
</tr>
<tr>
<td>Male</td>
<td>48%</td>
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## Research and Interventions: Addressing Racial Funding Disparities

### Intervention Targets

### Submissions
- Institution
- Topic

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

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

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<thead>
<tr>
<th>Mentoring/coaching pilot to enhance submission and re-submission</th>
<th>Information on re-submission outreach and Anonymized application review study</th>
<th>IC select pay analysis and Topic further analyses</th>
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<tr>
<td></td>
<td></td>
<td>• Health disparities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Minority health</td>
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</table>
Anonymized Review Study to Assess Bias in Peer Review

- Request for Proposals: 2016, study now underway
- 1,200 R01s (previously submitted, 3 cohorts)
  - AA/B applicants
  - WH applicants (matched on sex, institutional types, score)
  - Randomly selected sample of WH applicants
  - Multiple reviewers will assess each anonymized or non-anonymized application, using standard CSR review criteria
- Will evaluate resulting scores for differences that may be due to race awareness, institution reputation, sex, and seniority
Ongoing Projects and Analyses

• NIH Steering Committee Diversity Working Group
  – Diversity supplements: electronic tracking, work under way

• Addressing Gender Inequality in the NIH Intramural Research Program Action Task Force
  – Implementation under way

• ACD Working Group Subcommittee on Workplace Climate and Harassment
  – With EDI, work under way, scientifically designed survey early 2018
Where Are We Now?
Setting the Stage for Next Steps

Average Number of URM Doctorate Recipients
2000-2012

2006-2012
38% increase

1,747 URG PhDs
(~10% total pool)

1,274 URG PhDs
(~9% total pool)

URMs (AA/B, H, AI/AN)
Where Are We Now?  
Setting the Stage for Next Steps

- ~10% of all PhD earners, 2006-2012:

- ~780 AA/B (~4% of entire pool)
  - 1% of all NIH RPG awards, 5.3% of all K awards (2006-2015)

- ~950 Hispanic (~5.7% of entire pool)
  - 3.3% of all NIH RPG awards, 5.7% of all K awards (2006-2015)

- 30 AI/AN (0.2% of entire pool), 30 NH/PI (0.2% of entire pool)
RPG Applicants and Awardees by Percent of Total, All NIH-supported Fields, 2006-2015, by Race

- American Indian or Alaska Native
- African American
- Asian
- Native Hawaiian or Other Pacific Islander
- White
- More-than-one race
- Unknown
- Withheld

RPG Applicants and Awardees by Percent of Total, All NIH-supported Fields, 2006-2015, by Ethnicity

- Hispanic
- Non-Hispanic
- More-than-one ethnicity
- Unknown
- Withheld

Legend: 
- Blue: Applications
- Red: Awards
Ethnic Demographics of Mentored Career Development (K01, K08, K23) Awardees, %

% Hispanic K Awardees Constant Over Time

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<th>Year</th>
<th>Hispanic</th>
<th>Non-Hispanic</th>
<th>Unknown/Withheld</th>
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<tr>
<td>FY 2000</td>
<td>116</td>
<td>284</td>
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<td>242</td>
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</tr>
<tr>
<td>FY 2013</td>
<td>152</td>
<td>240</td>
<td>158</td>
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</table>

Avg. 5.8%
% AA/B K Awardees Increased Over Time

Racial Demographics of Underrepresented Mentored Career Development (K01, K08, K23) Awardees, %

- More than one race
- Native Hawaiian or other Pacific Islander
- Black or African American
- American Indian/Alaska Native

N= 88 110 132 142 165 174 187 184 179 183 192 192 200 192 187 176
2017: Opportunity to Focus on Transition from Training to Career Independence

Estimate Of Fiscal Year 2015 Percentage Of Trainees And Early-career Scientists Being Supported By NIH (F; T; K)

2017 New Recommendations
Shifting Focus to Institutional Change: Promote Transparency and Accountability

- Promote systematic review and transparency of hiring and promotion procedures and policies to intramural and extramural research leadership
- Transparency: collect and make public aggregate diversity metrics (NIH, institutions)
- Provide tools for enhancing recruitment and retention
- Evaluation of impact
# 2017 ACD WGD Recommendations

## NIH Institutional Support and Oversight

1. Systematic review and transparency of hiring and promotion
2. Collect, publicize diversity metrics retrospectively
3. Identify NIH policies that create institutional barriers
4. Enhance DPC collaboration with ACD WGD
5. Expand SWD resources
6. Institutional partnering to disseminate successful recruitment and retention models

## Mentoring, Career Development, Recruitment, Retention

7. Focus diversity programming on career independence transition
8. Recognize value of teaching
9. Hubs of Innovation pilot
10. SWD Recruitment and Retention toolkit

## Research, Interventions

11. Fund science of workforce diversity
12. Review, track funding outcomes beyond R01s
13. Analyze impact of methodologies and institutional prestige on research funding
NIH Institutional Support and Oversight: 
**Key Elements**

- Institutional partnering to share successful recruitment, retention models
- Publicize aggregate diversity data (NIH, institutions)
  - Hires, promotions
  - Applicant, grant-topic diversity
- Promote, disseminate institutional best practices
  - Implicit-bias education and mitigation
- Create and share climate survey
- Training grants
  - Diversity focus
  - Expand funding of fellowships
  - Expand SWD resources to meet growing mandate for data collection, programming
Mentoring, Career Development, Recruitment, Retention: *Key Elements*

- Focus diversity programming, strategies, and policies on the transition from trainee to independent careers
  - Institutional accountability for faculty careers
  - Length of training, other barriers to career advancement
- Hubs of Innovation: public-private partnerships
- SWD open-source recruitment and retention toolkit
- Recognize value of teaching
  - Expand workforce diversity of research faculty: role models
  - Expand IRACDA
- Continue interagency collaboration on K-12
Research and Interventions: Key Elements

• Fund science of workforce diversity
  – Effect of workforce diversity on science and science products (identity is a proxy for cognitive diversity)
  – Expand and scale CEC to evaluate NIH diversity programs
• Review and track NIH policies, practices that affect funding outcomes
  – Mechanisms for funding translational, clinical, community-based research
  – Research grant structure (MPI, # applicants per discipline per institution)
• Investigate impact of methodologies, topic choice, and institutional prestige on funding outcomes
  – CSR anonymized review study
  – NIH-wide funding, review expertise for health-disparities research
Great minds think differently ... 

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RPG Awardees by Race, Ethnicity, and Field of Study, 2006-2015

RPG Awardees by Race, 2006-2015

- Applied & Clinical: N=23,824
- Basic: N=67,460
- Behavioral: N=32,841

- American Indian or Alaska Native
- Asian
- African American
- Native Hawaiian or Other Pacific Islander
- White
- More-than-one race
- Unknown
- Withheld

RPG Awardees by Ethnicity, 2006-2015

- Applied & Clinical: N=23,824
- Basic: N=67,460
- Behavioral: N=32,841

- Hispanic
- More-than-one ethnicity
- Non-Hispanic
- Unknown
- Withheld
RPG Awards to Underrepresented Racial and Ethnic Groups, by Field of Study, 2006-2015

- **Applied & Clinical**
  - American Indian or Alaska Native: N=1060
  - African American: N=318
  - Native Hawaiian or Other Pacific Islander: N=257
  - More-than-one race: N=1060

- **Basic**
  - Hispanic: N=1,583
  - More-than-one ethnicity: N=603

- **Behavioral**
  - Hispanic: N=405
  - More-than-one ethnicity: N=405