NIH Scientific Workforce Diversity Actions and Progress: 2014-2019

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M. Roy Wilson, MD | President, Wayne State University

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Acknowledgments

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NIH Scientific Workforce Diversity 2014-2019
Actions and Progress

Presentation Outline

• ACD Working Group on Diversity in the Biomedical Research Workforce recommendations and key data points (endorsed by the ACD in June 2012)

• Implementation of 2012 ACD recommendations
  • Applications/funding: R01, K, fellowships, training awards
  • National diversity trends - PhD recipients
  • Diversity Program Consortium (BUILD, NRMN)
  • Tracking and evaluation of diversity metrics (CEC)

• 2018 ACD recommendations focused on career-independence transition through institutional change

NIH Scientific Workforce Diversity Strategic Plan
Key Data Points Identified by the ACD WGD BRW
Context for Assessing Progress

National Data
- Small # URGs in STEM
- 504/year*

Research Project Grants** (R01eq)
- Applications
  - AA/B 1.3%
  - Hisp 3.4%
- Awards
  - AA/B <1%
  - Hisp 2.5%

K Awards (K01, K08, K23)
- AA/B 4%
- Hisp 5%

NIH Training Awards
- Pre-doc F30/F31
  - AA/B 1.3%
  - Hisp 3.4%
- Post-doc F32/T32
  - AA/B 1.3%
  - Hisp 3.4%

URG - 10% all pre-doc awards
URG - 8.1% NIH-sponsored post-docs

AA/B applicants 13% points less likely to be awarded R01

* Biological science, chemistry, and physics – 2000-2008
  (NSF women, minorities and people with disabilities report 2011)

**Note: Although generally NIH awards are made to institutions, as the applicants and awardees of NIH funding, for purposes of this presentation, the terms “applications,” “applicants,” and “awardees” reference those individuals designated as senior/key personnel on NIH applications and/or awards, respectively.
<table>
<thead>
<tr>
<th>Original 2012 ACD WGD BRW Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PIPELINE</strong></td>
</tr>
<tr>
<td>#3  additional financial support for undergraduates</td>
</tr>
<tr>
<td>#1  systematic review and evaluation of all diversity programs</td>
</tr>
<tr>
<td>#4  assess reason for <strong>disparity in grant awards</strong></td>
</tr>
<tr>
<td>#6  establish ACD Diversity Working Group</td>
</tr>
<tr>
<td>#2  develop interest in STEM in K-12 and beyond</td>
</tr>
<tr>
<td><strong>MENTORING</strong></td>
</tr>
<tr>
<td>#5  establish a system of mentorship “networks”</td>
</tr>
<tr>
<td><strong>PEER REVIEW</strong></td>
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<tr>
<td>#9  establish ACD Diversity Working Group Subcommittee on Peer Review</td>
</tr>
<tr>
<td>#10 implicit bias/diversity awareness training for scientific review and program officers</td>
</tr>
<tr>
<td>#11 design experiment to determine effects of application anonymization</td>
</tr>
<tr>
<td>#7  more detailed explanation for unscored grant applications</td>
</tr>
<tr>
<td><strong>INFRASTRUCTURE</strong></td>
</tr>
<tr>
<td>#8  establish bold, <strong>multi-year awards to enhance diversity</strong> at under-resourced institutions</td>
</tr>
<tr>
<td>#12 appoint chief diversity officer and <strong>establish office of diversity</strong></td>
</tr>
<tr>
<td>#13 more comprehensive search for tenure-track investigators (e.g., Stadtman search)</td>
</tr>
</tbody>
</table>
Interpreting R01 Success Rates in Context of Decline in Pay Lines: 
Gap Persists but is Slightly Narrowed

Success rate for Type 1 R01 (Ginther et al. 2011):
FY 2000 – 2006
- African American applicants: 17.1%
- White applicants: 29.3%

**Differential success (AA:W) 0.58**

Success rate for Type 1 R01-Equivalent:
FY 2013 - 2018
- African American applicants: 11.3%
- White applicants: 18.1%

**Differential success (AA:W) 0.63**

Cochran-Mantel-Haenszel statistics

Effect of race adjusted for time period: 184.45, p<0.0001
R01eq Applicants* and Funding Rates (Type 1 and 2) Race/Ethnicity
FY2013 and FY2018

Number of Applicants

<table>
<thead>
<tr>
<th></th>
<th>FY2013</th>
<th>FY2018</th>
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</thead>
<tbody>
<tr>
<td>Applicants</td>
<td>20,000</td>
<td>19,153</td>
</tr>
<tr>
<td>Funding Rate</td>
<td>40.0%</td>
<td>35.0%</td>
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<thead>
<tr>
<th></th>
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<th>FY2018</th>
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<tr>
<td>Applicants</td>
<td>18,000</td>
<td>16,918</td>
</tr>
<tr>
<td>Funding Rate</td>
<td>31.4%</td>
<td>29.6%</td>
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<table>
<thead>
<tr>
<th></th>
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<tr>
<td>Applicants</td>
<td>16,000</td>
<td>14,000</td>
</tr>
<tr>
<td>Funding Rate</td>
<td>30.0%</td>
<td>28.6%</td>
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<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Applicants</td>
<td>12,000</td>
<td>8,000</td>
</tr>
<tr>
<td>Funding Rate</td>
<td>25.0%</td>
<td>15.0%</td>
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<table>
<thead>
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<th>FY2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicants</td>
<td>10,000</td>
<td>6,000</td>
</tr>
<tr>
<td>Funding Rate</td>
<td>20.0%</td>
<td>10.0%</td>
</tr>
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<table>
<thead>
<tr>
<th></th>
<th>FY2013</th>
<th>FY2018</th>
</tr>
</thead>
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<tr>
<td>Applicants</td>
<td>8,000</td>
<td>4,000</td>
</tr>
<tr>
<td>Funding Rate</td>
<td>19.6%</td>
<td>10.0%</td>
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<table>
<thead>
<tr>
<th></th>
<th>FY2013</th>
<th>FY2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicants</td>
<td>6,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Funding Rate</td>
<td>12.2%</td>
<td>5.0%</td>
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<thead>
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<th>FY2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicants</td>
<td>2,000</td>
<td>0</td>
</tr>
<tr>
<td>Funding Rate</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

28.9% increase AA/B applicants

68.9% increase AA/B funding rate

* Principal Investigators
African-American and Hispanic/Latino R01eq Awardees* (Type 1 and 2) FY2013 and FY2018

Number of Awardees

<table>
<thead>
<tr>
<th>Year</th>
<th>Black or African-American</th>
<th>Hispanic or Latino</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>52</td>
<td>113</td>
</tr>
<tr>
<td>2018</td>
<td>113</td>
<td>183</td>
</tr>
</tbody>
</table>

117% increase

# AA/B awards

* Principal Investigators
Funding Rates Mentored Career-Development (K-Series) Awardees*  
Type 1 and Type 2: FY2013 and FY2018

- American Indian/Alaska Native
- Black or African-American
- Hispanic or Latino
- Asian
- White

* Principal Investigators
African-American and Hispanic/Latino K Awardees* (Type 1 and 2) FY2013 and FY2018

142% increase

# AA/B awards

* Principal Investigators
URMs Supported on Predoctoral and Postdoctoral Training* Grants (2018)
Increased to 20% from 12% in 2012

Number of Trainees

<table>
<thead>
<tr>
<th>WR</th>
<th>URM</th>
</tr>
</thead>
<tbody>
<tr>
<td>10,357</td>
<td>2,074</td>
</tr>
</tbody>
</table>

WR = Well-represented White and Asian American
URM = Underrepresented American Indian/Alaska Native, African American/Black and Native Hawaiian/Pacific Islander

* T15, T32, T34, T35, T90, TL1, TL4
URM Trainees Supported on Predoctoral Fellowships (F31) and Postdoctoral Fellowships (F32)
Increased in 2018 to 14.4% from 10% in 2012

WR = Well-represented
White and Asian American

URM = Underrepresented
American Indian/Alaska Native, African American/Black and Native Hawaiian/Pacific Islander
## PhD Recipients in NIH-Relevant Fields
### Increase in URM Representation (2012-2017)

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>2012</th>
<th>2017</th>
<th>% Change</th>
<th>2012</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Totals</strong></td>
<td>7,994</td>
<td>8,567</td>
<td>100.00%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hispanic or Latino</strong></td>
<td>493</td>
<td>606</td>
<td>22.92%</td>
<td>6.17%</td>
<td>7.07%</td>
</tr>
<tr>
<td><strong>American Indian or Alaska Native</strong></td>
<td>24</td>
<td>25</td>
<td>4.16%</td>
<td>0.30%</td>
<td>0.29%</td>
</tr>
<tr>
<td><strong>Asian</strong></td>
<td>934</td>
<td>1,014</td>
<td>8.56%</td>
<td>11.68%</td>
<td>11.84%</td>
</tr>
<tr>
<td><strong>Black or African American</strong></td>
<td>448</td>
<td>577</td>
<td>28.79%</td>
<td>5.60%</td>
<td>6.74%</td>
</tr>
<tr>
<td><strong>White</strong></td>
<td>5,880</td>
<td>6,059</td>
<td>3.04%</td>
<td>73.56%</td>
<td>70.72%</td>
</tr>
<tr>
<td><strong>More than one race</strong></td>
<td>215</td>
<td>286</td>
<td>31.56%</td>
<td>2.69%</td>
<td>3.34%</td>
</tr>
</tbody>
</table>

**Source:** NSF Survey of Earned Doctorates 1997-2017
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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: 3,470*
• Mentees: 5,690 *
• Grantwriting/coaching - mentees: 546*
  • 152 awards granted (89 NIH awards)

Phase II begins July 2019

Hispanic-Serving Institutions*

Historically Black Colleges and Universities

State Colleges

Public Universities

Total of 10 Sites/Experiments

*Data as of January 2019

*Track record of training Hispanic students
BUILD Dashboard (Years 1-5*)

**Student**
- BUILD NRSA training slots (TL4): 1157
- BUILD research training slots (RL5): 1080
- BUILD TL4 graduates (B.S./B.A.): 304
- BUILD TL4 graduates pursuing post-secondary education: 164
- Research Mentor Training (# non-unique participants): 3039

**Faculty**
- Faculty Mentor Training (# activities): 146
- Faculty Professional Development (# activities): 152
- Faculty Release Time (# participants): 248
- Pilot Projects: 199
- Publications**: 259

**Institution**
- Institutional Partner Agreements: 113
- Novel Curriculum: 104

*Data from YR5 is interim through Dec. 2018*
BUILD NRSA Demographics

- Hispanic: 41%
- White, Non-Hispanic: 12%
- Black, Non-Hispanic: 27%
- Asian, Non-Hispanic: 12%
- American Indian, Alaska Native, Pacific Islander, or Multiple Races: 6%
- Unknown / Withheld: 2%

Spring 2019 data
n=1138
<table>
<thead>
<tr>
<th><strong>By the Numbers</strong></th>
<th><strong>Details</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Grant writing/coaching programs (GCPs)</td>
</tr>
<tr>
<td>546</td>
<td>Investigator participants in all GCPs</td>
</tr>
<tr>
<td>89</td>
<td>NIH awards (71% URG, 73% Women)</td>
</tr>
<tr>
<td>152</td>
<td>Awards (NIH + non-NIH)</td>
</tr>
<tr>
<td>$65M</td>
<td>Total NIH funds across GCPs</td>
</tr>
</tbody>
</table>
NRMN Demographics of Grantwriting/Coaching Participants

Grant Recipients* (top categories)

- **K01, K08, K22, K23, K12, KL2**
  - 63% URM
  - 67% Female

- **Other Rs**
  - 45% URM
  - 80% Female

- **R01, INBRE**
  - 57% URM
  - 79% Female

*Note: Although generally NIH awards are made to institutions, as the applicants and awardees of NIH funding, for purposes of this presentation, the terms “applications,” “applicants,” and “awardees” reference those individuals designated as senior/key personnel on NIH applications and/or awards, respectively.*
NIH Awards to NRMN Grantwriting/Coaching Participants

Details by Award Types

Overall NIH Awards Received: 89
71% to URM
73% to female
22% to MSI
DPC Timeline

Phase I: Develop and implement interventions & evaluations; publish early findings

$250 million committed over 5 years

Year 1: Developing, planning
Year 2: Implementing interventions, collecting data

Phase II: Focus on continuing interventions, tracking and evaluations, as well as sustainability and dissemination

Year 6: Issued funding announcements
Year 7
Year 8
Year 9: Review applications, make awards
Year 10
Tracking and Evaluation of Diversity Metrics Coordination and Evaluation Center (CEC)

FIGURE 1. MEAN SCIENCE IDENTITY SCORES - BUILD AND NON-BUILD STUDENTS IN DIFFERENT TYPES OF BIOMEDICAL MAJORS

* p<.001
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2018 ACD WGD Recommendations (endorsed by ACD): Implementation Update

RESULTS-BASED ACCOUNTABILITY

1. Diversity/inclusion metrics reporting template

FACULTY INSTITUTIONAL RECRUITMENT FOR SUSTAINABLE TRANSFORMATION (FIRST)

2. Career-independence transition: Faculty-development institutional FOA for cohort model

NIH ADVANCING DIVERSITY PROGRAMS CONFERENCE (JUNE 24, 2019)

3. National diversity/inclusion conference

ENHANCE MENTORING AND PROFESSIONAL DEVELOPMENT

4. Diversity supplements: Trans-agency standards
Decoupling the Minority PhD Talent Pool and Assistant Professor Hiring

Population Growth Relative to 1980

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.
NIH Distinguished Scholars Program Goals: 
Cohort Model in NIH’s Intramural Research program

- Institutional transformation by recruiting a substantial number of PIs with demonstrated commitment to inclusive excellence (15 per year)
- Build self-reinforcing community of PIs committed to diversity and inclusion
- Provide professional development and culture that values mentoring and inclusion
- Send the message that NIH values a commitment to inclusive excellence

Extramural: Request for Information (RFI): Institutional Accountability to Promote Inclusive Excellence
Release Date: February 25, 2019; Response Date: June 14, 2019
Faculty Institutional Recruitment for Sustainable Transformation

FIRST Program Goals

- Promote inclusive excellence
  - Address racial/ethnic, gender gaps in postdoc > faculty transitions
  - FIRST would be the first nationwide attempt to enhance inclusive excellence through NIH-funded institutional transformation
- Institutional transformation
  - Recruit critical mass of PIs with demonstrated commitment to diversity and inclusion
- Professional development and culture that values mentoring and inclusion
  - Institution sends message that it values diversity and inclusion
Progress on Key Data Points (2018)

Summary

• Research Grants - R01
  – Increase in # URG applicants
  – Increase in # awardees and award rate
  – B/AA – White gap slightly narrowed

• Mentored Career development – K series
  – Increase # URG applicants, # awardees and award rate
  – B/AA – White gap significantly narrowed

• Predoctoral and postdoctoral fellowships
  – Increase in # URGs

• PhD recipients (Life science, chemistry, math)
  – Increase in # URGs (14% of pool)