Diversifying the Professoriate: Approaches to Recruitment, Retention and Inclusion

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Organ Transplant as Genome Transplant
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Plasma Sample
Organ Transplant as Genome Transplant
Genomic Research Alliance for Transplantation (GRAfT) - Progress to Date

- Enrollment started in June 2015
- Cf-ddDNA technology
- Enrollment on-going at 5 centers
  - 173 patients enrolled
  - 114 transplanted (68 heart; 46 lung)
- Biorepository: Over 6,000 biospecimens banked
- Clinical Data: > 900 time points
Addressing the Science of Diversity:
Time for Scientific Rigor and Integrated Approach

Presentation Outline

• Defining the issue of lack of diversity
• Why diversity?
  – Driving force for excellence and innovation
• Addressing four cross-cutting diversity challenges with scientific rigor
  – Unconscious bias (Pervasiveness, overcoming bias)
• Building evidence, sustaining diversity (data-driven)
  – Diversity Program Consortium
  – Lessons learned from NIH intramural research program
  – Hubs of Innovation
Why Diversity Matters
Capitalizing on the Opportunity

• Excellence, creativity, innovation
• Broadening scope of inquiry - solutions to complex problems of health and disease
• Impact of workforce diversity on health disparities
• Ensuring fairness
  – Changing demographics
  – Leveraging the entire U.S. intellectual capital
Why Diversity Matters for NIH

NIH-Wide Strategic Plan
Fiscal Years 2016-2020

Turning Discovery Into Health

Enhance Stewardship
- Recruit/retain outstanding research workforce
- Enhance workforce diversity
- Encourage innovation
- Optimize approaches to inform funding decisions
- Enhance impact through partnerships
- Ensure rigor and reproducibility
- Reduce administrative burden
ACD WG Recommendation (2012)
Chief Officer for Scientific Workforce Diversity
Accountability, Evaluation, Coordination

• Recruit an active biomedical researcher with commitment to diversity and strong credibility in the academic community
• Charge: Coordinate diversity programs across NIH
• Intramural research program can be a critical space for learning about diversity recruiting/retention
• All programs must be subject to rigorous evaluation
NIH Addresses the Science of Diversity

Recruitment, Retention: What Works and Why?

Context matters

Sustaining Diversity

Diversity Science

Sociocultural Factors

Valantine and Collins.
PNAS 2015: Oct 6;112:12240-2
Better Problem-solving Results From A Larger Informational, Or Cognitive Space

• Argument: diversity outperforms ability
• Test: hypothetical scenarios designed to reflect individual’s problem solving abilities toward making a hiring decision - 1,000 applicants
• Result: 20 people randomly selected from the qualified applicant pool were better at solving the problem than the highest-scoring individual or 20 individuals with the next highest 20 scores

Diversity and 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.
- Lots of homophily: association with similar others

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

- Similar finding for gender diversity*

NIH Addresses the Science of Diversity

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Diversity Science

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Targeted Recruiting and Retention: Enhancing NIH Intramural Diversity

- Scientific opportunities in the IRP
- Underrepresentation: Pipeline, attrition
  - Women
  - Race/ethnicity
- Enhancing diversity in the IRP – SWD partnership
  - Recruitment and retention of tenure-track scientists
  - SWD tools
  - Unconscious bias education
Recruiting Tool for Junior Career Stage
Postdoctoral and Assistant Professors

• ~ 525 total, top 1/3rd culled
• 4-10 years post-doctorate (most 4-7)
• Authorship in top journals
• 10+ publications: 188
• 100+ citations: 198
• 200+ citations: 136
Trans-NIH effort to engage talented early-stage biomedical and behavioral scientists from diverse backgrounds to promote knowledge and awareness about scientific career opportunities in the NIH intramural research program.
Understanding What Works: NIH Diversity Program Consortium

Pipeline, Mentoring, Evaluation

Awards made October 2014

**BUILD:** 10 sites/experiments

**NRMN**

**CEC**

Total: $250 million (5 years)

**BUILD (500 scholars 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

**NRMN**
- Boston College
  - Morehous SM; U. Min.; U. North Texas; U. Wisconsin

**CEC**
- University of California Los Angeles
Understanding What Works: NIH Diversity Program Consortium
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Hypotheses Being Tested by BUILD
- Stereotype threat
- Critical race theory
- Student entrepreneurship
- Living and learning communities

NRMN Activities
- Guided virtual mentorships
- MyNRMN tool
- Mentors trained: 250
- Mentee/mentors touched 3,100
- Grantwriting/coaching - mentees: 225
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Diversity Science

Sustaining Diversity
Bias is Pervasive in Science and Beyond

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

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

Recommendation letters for women:  
Shorter;  
More “doubt raisers” (hedges, faint praise, and irrelevancies);  
More references to personal life

“It’s amazing how much she’s accomplished.”

Welcome to the world of sport. It’s a world where men are "strong, big, real, great or fastest”

“… she became the third new mum to retain Olympic gold" … “asked how she cares for her skin and how training affects her hair.”
Study: “Who is a Scientist?”

- Pictures of actual faculty members in STEM at elite universities
- Rated for masculinity and femininity
- Separate group of students rated pictures for likelihood of being a scientist

Study: “Who is a Scientist?”

- Pictures of actual faculty members in STEM at elite universities
- Rated for masculinity and femininity
- Students rated pictures of a likelihood of being a scientist or an early childhood educator

Result: For females, the more feminine the person is rated, the more likely she is rated to be an early childhood educator and less likely to be a scientist.

Unconscious Bias in Academic Science

A nationwide sample of biology, chemistry, and physics professors (n=127) evaluated application materials of an undergraduate science student (female or male) for a lab manager position.

1. **Both** male and female faculty participants rated the female student as:
   - Less competent
   - Less hireable
   - Offered lower salary ($3.7K)
   - Less mentoring

2. Even though the female was rated more likeable

Unconscious Bias: Habits Can Be Broken

- 92 departments, matched by school/college
- Randomized controlled intervention

- Intervention group reported:
  - Greater personal bias awareness
  - More motivation to promote gender equity
  - More confidence in being able to enact gender equity
  - Feel that it would be personally beneficial to promote gender equity in one’s department

- Persisted 3 months

2015 Stadtman Unconscious Bias Education
Goals and Objectives

• Raise awareness of unconscious bias and reduce its impact in the search process
• Test feasibility
• Scientifically test the efficacy of the educational module

- Does unconscious bias education affect the Stadtman search process and outcomes?
- Pre- and post-measurements of implicit/explicit bias
NIH Addresses the Science of Diversity


Diversity Science

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Sustaining Diversity
Addressing Racial Funding Disparities: New Data

• Ginther et al. (2011): AA/B applicants (FY2001-2006) less likely to be awarded R01 grant compared to WH applicants
  – Controlling for demographics; education and training; employer characteristics; NIH experience; research productivity

• AA/B Funding Disparity Working Group follow-up analysis with more recent data (FY2008-2014)
  – Multifactorial
  – Disparity at each stage in the process
    ➢ Initial applications, re-submissions, review outcome (score), number of applications discussed, funded
  – Cumulative disparity
    ➢ Applications from AA/B scientists funded at a significantly lower rate than applications from white (WH) scientists (11% vs. 18%)
    ➢ AA/B scientists funded at half the rate as WH scientists, taking into account lower AA/B submission rates
Sustaining Diversity: Retiring the Pipeline Metaphor......
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... and thinking about a system
Underrepresentation is Not Just a Pipeline Issue


- URG talent has grown 7-fold over past 20 years
- Academia is not tapping into the pool of URG scientists
- Filling the “pipeline” is necessary but not sufficient
- The math
  - AAMC institutions (about 150) hire ~1,000 assistant professors per year
  - 10% URG representation = 100 URG faculty

If 2/3 of AAMC institutions hired and retained one URG faculty member per year for 6 years, there would be parity in hiring assistant professor pool in one tenure cycle (5-6 years)
Great minds think differently ... 

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