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#SWDSS



NIH Scientific Workforce Diversity Seminar Series

The Case for Diversity and Innovation

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diversity.nih.gov



National Institutes of Health
Office of the Director
Chief Officer for Scientific Workforce Diversity

Outline

- Diversity → Innovation
- Innovation → Diversity

Asking the Right Question

- What is the evidence that diversity leads to more innovation?

OR

- What is the evidence that lack of diversity leads to more innovation?

The Diversity-Innovation Paradox

Study of near-complete population of ~1.2 million US doctoral recipients (1977-2015) following their careers into publishing and faculty positions, using text analysis and machine learning

Results

- “Underrepresented groups produce higher rates of scientific novelty”
- “Novel contributions by minorities are taken up by other scholars at lower rates than novel contributions by majorities”
- “Equally impactful contributions of minorities are less likely to result in successful scientific careers than for majority groups”

Implications: academia discounts diversity’s role in innovation and partly explains the underrepresentation of some groups

Hofstra et al, PNAS, 2020
<https://doi.org/10.1073/pnas.1915378117>

Gender-diverse teams produce more novel and higher-impact scientific ideas

Study of 6.6 million research publications by 3.2 million women and 4.4 million men scientists in more than 15,000 medical science journals from 2000 to 2019

Results

- Mixed gender research teams growing in number but still lower than expected
- Publications of mixed-gender teams are substantially more novel and impactful than the publications of same-gender teams of equivalent size
- The greater the gender balance on a team, the better the team scores on novelty and impact
- These patterns generalize across medical subfields

Yang et al, PNAS, 2022
<https://doi.org/10.1073/pnas.2200841119>

Other Benefits of Diverse Research Teams on Innovation and Impact

- Insider knowledge of how to solve problems in diverse communities
- Proxy trust to conduct research with diverse communities
- Increase diversity of research participants
- Role models and mentors for diverse trainees
- Reduce inequities in social determinants of health through education and employment

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Deconstructing the Pipeline

- Deficits vs. Assets
- Measurable vs. Hard to Measure
- Attrition vs. Opportunity
- Individuals vs. Structures

A Structural Approach to Diversity: The AEIOU Principles

A

Accountability

E

Engagement

I

Individual-Centered Institutional Change

O

Opportunities

U

Unity

NCATS Clinical and Translational Science Awards (CTSA) DEIA Enterprise Committee Learning System Framework

Learning System Accountability Framework*

A multi-layered framework for the CTSA hubs and affiliates to individually and collectively understand and address DEIA, improve research infrastructures, and advance clinical and translational science.

DEIA Principles

A set of five guiding principles to drive DEIA efforts and normalize approaches across the CTSA consortium.

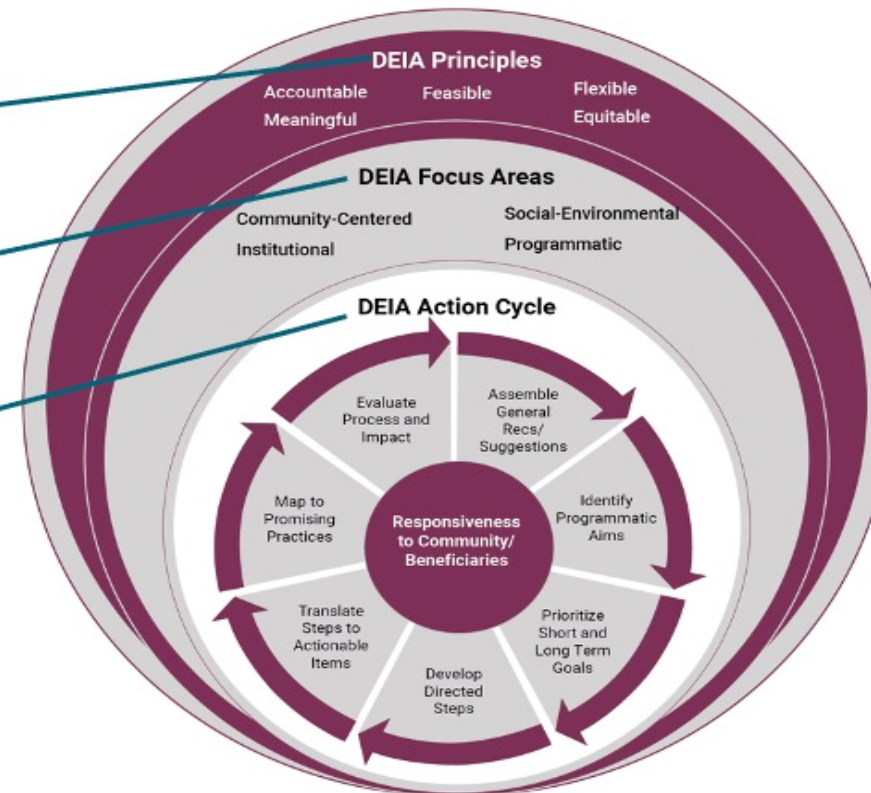
DEIA Focus Areas**

The set of four areas that drive the recommendations for DEIA action.

DEIA Action Cycle

An iterative, seven-stage process for continually identifying, designing, and implementing project or programmatic aims to address DEIA, based on a set of stakeholder-driven recommendations.

CTSA DEIA Learning System Framework



* Carter-Edwards, Hightower, Schick et al., JCTS 2022

** Boulware, Corbie, Aguilar-Gaxiola, et al., 2022.

CTSA DEIA Recommendations

(Carter-Edwards et al, JCTS 2022)

Focus Area	Sub-Areas	Recommendation Highlights
Institutional	<ul style="list-style-type: none"> Broad Institutional Commitment to DEIA Developing Leaders and Leadership Pathways Community as Institution Partner Acknowledge/address structural racism and historical research abuse 	<ul style="list-style-type: none"> Build institutional partnerships <ul style="list-style-type: none"> Standing institutional leadership DEIA meetings Employee idea-sharing environment Make room for DEIA structural changes <ul style="list-style-type: none"> Improve the quality of DEIA research and increase its workforce
Programmatic	<ul style="list-style-type: none"> Develop DEIA-Conducive Training Environments Build DEIA into Research Teams Value and nurture the whole scholar: past, present, and future 	<ul style="list-style-type: none"> Support cross-community, cross-institutional learning communities, including training opportunities Require and provide community engagement training for those working with communities/organizations Embed minority health and health disparities experts into research teams
Community-Centered	<ul style="list-style-type: none"> Research for the Community Research with the Community 	<ul style="list-style-type: none"> Assess community needs as prioritized by CHNAs Know and represent catchment communities in trials Increase the level and quality of community relationships
Social Cultural Environmental	<ul style="list-style-type: none"> Identifying and Dismantling Assumptions Amplifying Diverse Voices Across the Translational Science Continuum 	<ul style="list-style-type: none"> Recognize and value the entire health profession, community partners, and Minority Serving Institutions Increase decision-making authority of community and staff Include community voice across the research continuum

CTSA DEIA Survey

92% response rate

	%
Implementing plan to recruit diverse researchers	42.4%
Implementing plan to recruit diverse staff	43.1%
Has a DEIA Dashboard	32.2%

Partnerships with Minority-Serving Institutions (MSIs)

- If you want diverse people, go to where they are!
- MSIs know better how to create inclusive and equitable environments
- MSIs invest in creating environments to help under-represented trainees to succeed
- Recruiting MSI graduates without investing in MSIs is exploitative
- Partnership with and investing in MSIs is a structural intervention to increase diversity!

Example: SF BUILD

- Partnership between San Francisco State University (MSI) and University of California San Francisco
- PIs: Márquez-Magaña, Bibbins-Domingo, Morris, Nguyen, Parangan-Smith
- Funded by NIH/NIGMS BUILD Initiative

Social & Institutional Structures:

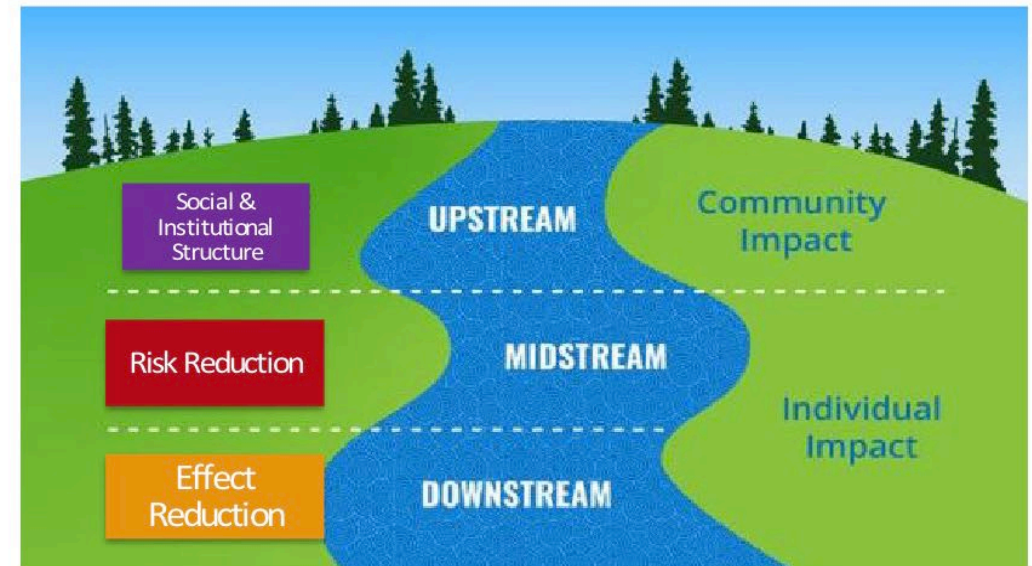
- 3 A's Framework addressing institutional Racism systemic barriers in STEM
- SF State-UCSF Partnership

Risk Reduction:

- Faculty Training – Stereotype Threat & Microaffirmation Workshops
- Awareness building with MA² App
- Faculty Professional Development – Writing Retreats & Minigrants

Effect Reduction:

- Student Support through research and teaching aligned with communal values
- Mentorship
- Counterspace and Community Building



SF BUILD Outcomes

Student Training Program	Program Description	Years Active	Number of Students Supported	Retention in Biomedical Programs/ Workforce
SF BUILD Scholars Program	2-year training program for Upper Division UG. Stipend support, tuition, research & travel supplies. Required curriculum & close mentorship	2014-Present	102	97% (n=68)
BUILDing Bridges	1-year Post-bacc & Master's Level Trainees, stipend support, required professional development workshops & close mentorship	2018-Present	17	91%
CIRCLE	2-week introduction to Clinical Research Coordinators (CRC) & 20 hours of CRC Shadowing for senior UG, Grad, & Post-bacc students. Stipend support.	2020 - Present	39	95%
Agents of Change Merck Fellows & Scholarships	Semester-long stipend or scholarship support (with renewal opportunities) for UG, Grad & Post-bacc, required professional development workshops	2022 - Present	58	95% (n=21)

At end of grant, UCSF commits funds to support the SF BUILD Partnership Office at both UCSF and SF State

Institutional Intervention Example: UCSF

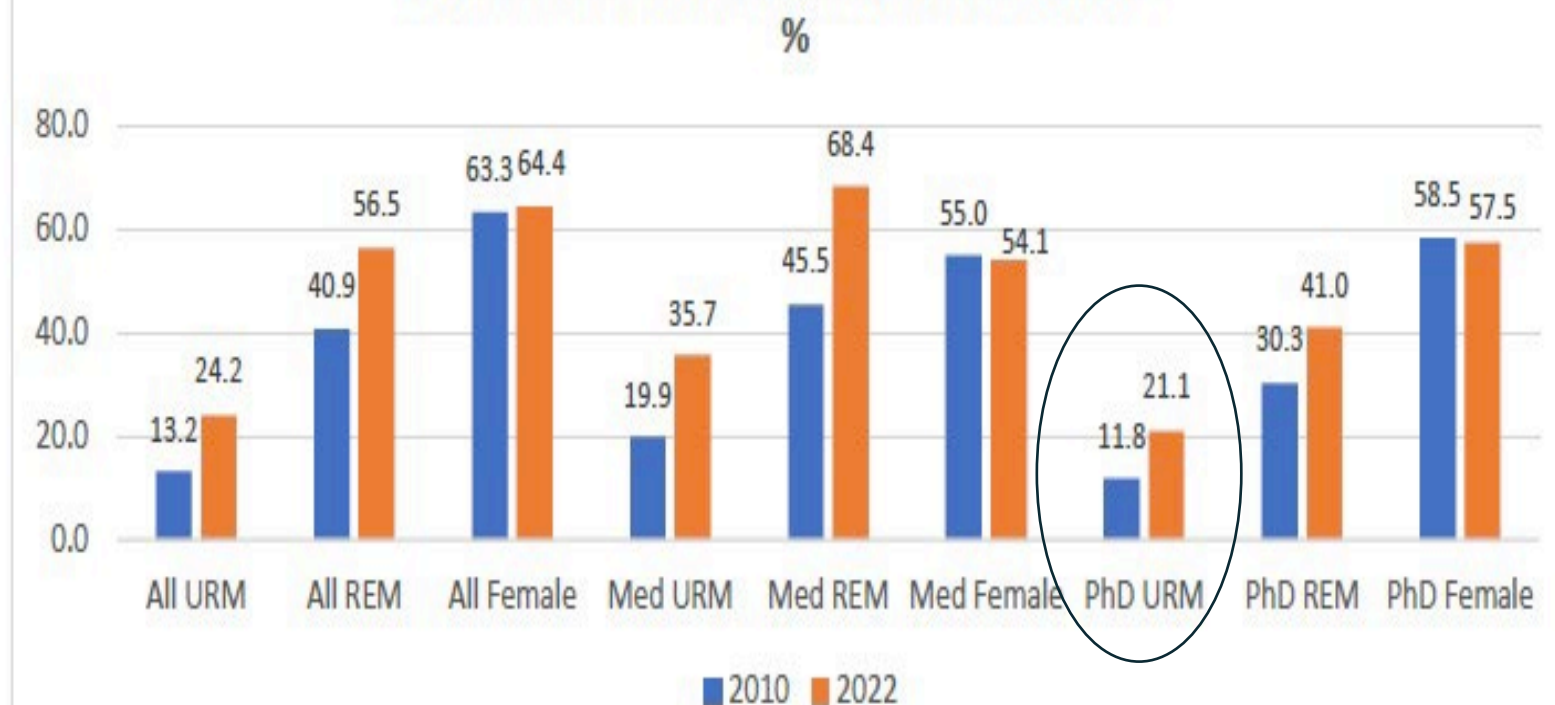
- Phase 1 (2010-2015): Organized, executive-led institution-wide approach
 - Increase accountability: creation of campus-wide Office of Diversity and Outreach reporting directly to Chancellor, **publicly available dashboard**, reporting and compliance systems
 - Culture change: creation of Multicultural Resource Center, Unconscious Bias training, **requirement of “contribution to DEIA” statement for faculty promotion**, faculty equity advisor program for faculty searches
- Phase 2 (2015-2020): Stakeholder-engaged institutional change
 - **Holistic review** process for admission to professional and research training programs
 - Requirement **that search committees have sufficient proportions** of women and/or minorities
 - Transdisciplinary approach to hiring under-represented researchers in the basic sciences
 - Recruitment and retention program for early career under-represented faculty
- Phase 3 (2020-present): Anti-Racism Initiative
 - Anti-racism and anti-oppression curriculum for all schools
 - Office of Research Inclusion, Diversity, Equity, and Anti-Racism (IDEA)
 - Anti-racism in research pilot funding and consultation service
 - Anchor institution approach to leverage economic and employment power to assist minority communities

Example: Diversity Outcomes

Figure 1. UCSF Faculty Demographics, 2010-2022



Figure 2. UCSF Student Demographics 2010-2022



Parting Thoughts

- Diversity leads to innovation and impact in science
- Diverse leaders are constantly innovating to increase diversity
- Structural problems need structural solutions
- Engagement and partnership are crucial in efforts to increase diversity
- Increasing diversity is possible in all kinds of environment
- We need more investment in the science of workforce diversity

Thank you!
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