Foreword: Training the Next Generation of Health Equity Researchers: Exploring STEM Pathways and Best Practices

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Introduction

Underrepresented minority (URM) populations remain disproportionately affected by poor health outcomes in the United States.[1] By 2050, it is estimated that more than half of the United States' citizenry will belong to an underrepresented group.[2] If this trend holds true, the gaps in health disparities may continue to broaden. In addition, as the diversity among racial/ethnic groups increases, the United States will need to rely upon URMs to enter academic and research careers to advance the well-being of all individuals regardless of race, ethnicity, socioeconomic status and cultural characteristics.

Diverse teams add value and innovation to scientific discovery.[3] The lack of entry into, and retention of individuals from diverse backgrounds in academic and biobehavioral science research and health professions is arguably the lynchpin to impeding progress toward improving health outcomes and eliminating health disparities. While many URMs and other underrepresented individuals express interest in entering STEM career paths to conduct research that affects their communities, often their educational backgrounds and lack of programming create barriers that impede their progress. In addition, it is believed that the

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Table 1. Addressing underrepresentation in the biomedical workforce: key themes and findings

Status: Underrepresentation in the biomedical workforce	
	Fewer than 5% of doctoral degrees in science and engineering are awarded to URMs.
	As low as 16% of URMs entering STEM degrees attain a BS degree.
	10% of BS URM recipients earn a doctoral degree.
	African Americans are 10% less likely to receive major NIH awards (eg, R01) than their White counterparts.
Career Stage: Key themes and findings	
K-12	Short-term research experiences for high school students offer approaches to program development for preparing a pool of high school students for health careers and research (Rivers et al).[12]
	Innovation of a three-pronged program illustrates components reaching middle school students and their families, high school students and undergraduates, and high school teachers to strengthen capacity (Qua et al).[13]
	Of the 900 students enrolled in the SLAM high school program, 90% enrolled in college (Harris et al).[14]
Undergraduate	Intensive pre-college program for entering freshmen improved student success in college: increased GPAs and graduation rates (Oppenheimer et al).[15]
	Summer programming prepares entering college students for STEM rigor to overcome the achievement gap (White et al).[16]
	Program has 77% success rate in promoting a career in biomedical research among participating students, with 100% of minority participants entering a graduate program and/or career focused on health equity (Smalley and Warren).[17]
Graduate level	Postbaccalaureate Research Education Programs (PREP) have been proven effective, scaled nationally, and are contributing to increased diversity in the biomedical workforce.[18]
	Successful program at UNTHSC increased doctoral degrees from 64% to 84% for participating URM students from 1996 to 2018.[19]
Postdoctoral and early career faculty	Promoting self-efficacy is a critical determinant in advancing through career transition points.[20]
	A conceptual framework, best practices in research training and mentoring, along with barriers identified by program participants inform the OHD-PRIDE research training and mentoring.[21]

URM, underrepresented minority; OHD-PRIDE, Obesity Health Disparities PRIDE program; BS, bachelor of science degree.

presence of URM faculty and professionals in the biobehavioral research workforce motivates the next generation of URM students to pursue health research careers.[4-7]

Advances in the biological, behavioral and social sciences that affect minority populations would likely be in peril without interest in education and research training initiatives for URMs. For many years, the National Institutes of Health (NIH) and other extramural educational, research institutes, industries and non-for-profit organizations have embraced a mission to support the training of a diverse workforce. Yet, such interest and investment have not significantly influenced the status quo. Across all academic transition points, URMs and individuals from disadvantaged backgrounds lagged behind in career persistence, placement and advancement, especially in the biobehavioral research workforce.[8-11]

This themed issue represents a collection of articles wherein authors raise attention to the past, present and future barriers of addressing the status of diversity within the STEM and biobehavioral academic paths. Articles also

highlight the successful local and national outreach and educational training programs spanning K-12 to early career faculty (Table 1).

I applaud the researchers, faculty members and others who have contributed to the research within this issue. Many of the programs presented reflect a deep commitment to ensuring that a diverse health care and research workforce is prepared and supported to undertake the rigors of scientific discovery and application. Readers will find that the underlining factor of many of these successful efforts demonstrates this commitment from both universities and individuals who offer critical skills building and training that encourage URMs to take their place in directing the future health and well-being of all populations.

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From the research presented within this issue, it is anticipated that the knowledge gained will heighten the continuing need to address the diversity gap in the biobehavioral research workforce and serve as a reference for the implementation of best practices to be scaled nationally. Ultimately, this research, the programs described, evaluated and proven effective, and the resulting strengthened workforce should have long-term positive influences on reducing health inequities and disparities among URMs and underserved populations.

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