

**SPECIAL FEATURE**

# Role of Institutional Climate in Fostering Diversity in Biomedical Research Workforce: A Case Study

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## OUTLINE

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### LESSONS LEARNED

## ABSTRACT

This article reviews the barriers to diversity in biomedical research and describes the evolution of efforts to address climate issues to enhance the ability to attract, retain, and develop underrepresented minorities, whose underrepresentation is found both in science and medicine, in the graduate-school biomedical research doctoral programs (PhD and MD/PhD) at Mount Sinai School of Medicine. We also describe the potential beneficial impact of having a climate that supports diversity and inclusion in the biomedical research workforce. The Mount Sinai School of Medicine diversity-climate efforts are discussed as part of a comprehensive plan to increase diversity in all institutional programs: PhD, MD/PhD, and MD, and at the residency, postdoctoral fellow, and faculty levels. Lessons learned from 4 decades of targeted programs and activities at the Mount Sinai School of Medicine may be of value to other institutions interested in improving diversity in the biomedical science and academic medicine workforce. *Mt Sinai J Med* 79:498–511, 2012. © 2012 Mount Sinai School of Medicine

**Key Words:** biomedical research, diversity, institutional climate, underrepresented minorities, workforce.

The importance of improving racial and ethnic diversity in biomedical research and academic medicine has been noted by a number of nationally recognized leaders and organizations in medicine and research.<sup>1–4</sup> The Institute of Medicine has also

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connected recommendations for healthcare workforce and research diversity to supporting efforts to reduce health disparities and increase culturally sensitive and appropriate healthcare.<sup>4</sup>

Additionally, the rationale for diversity has evolved over the past decade beyond focus on population parity, the need to address health disparities and expand research capacity, and social-justice rationales to include greater focus on diversity as a driver to support institutional excellence.<sup>1,2,5</sup> That said, the challenges to increasing diversity in biomedicine have been substantial and persistent. Notable barriers include historical challenges and systemic factors.<sup>1,6,7</sup> The role of institutional climate as a potential barrier to diversity has been increasingly documented as an important area of focus for institutions interested in achieving and sustaining substantive change in support of diversity.<sup>8-10</sup>

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This article reviews barriers to diversity in biomedical research and the impact of institutional climate on diversity. We present a summary of the evolution and impact of efforts to create an institutional climate to attract, retain, and develop individuals from underrepresented minority groups to biomedical research doctoral programs (PhD and MD/PhD) at the Mount Sinai School of Medicine (MSSM). These efforts are part of a comprehensive plan to increase diversity in all MSSM institutional programs, including the doctorate of medicine (MD) program, postgraduate residency training, and among postdoctoral fellows and faculty.

## BARRIERS TO DIVERSITY IN BIOMEDICAL RESEARCH WORKFORCE

### National and New York State PhD and MD/PhD

Much has been written about the disparity between the growing representation of African Americans and Hispanics in the general population and their low representation in the professoriate and other doctoral-level biomedical research positions as well as in the overlapping areas of other science, technology, engineering, and mathematics (STEM) fields.<sup>11-13</sup> Students from these racial and ethnic groups made significant gains at the baccalaureate and master's levels across all fields during the 1990s.<sup>14</sup> However, their rates of PhD attainment across all fields remain well below their representation in the doctoral-age population.<sup>14</sup> Although racial/ethnic minority students represent the fastest-growing population in science and engineering at the bachelor- and master-degree levels, this progress is due to large gains over a very small base. Further, the retention of these students decreases en route to the doctorate degree and shrinks even further through the postdoctoral level and in the initial phases of becoming an independent researcher.<sup>11</sup> Of the 5577 total doctorates awarded to US citizens and permanent residents in the biological and biomedical sciences in 2010, 10.5% were awarded to underrepresented minority (URM) students. Specifically, American Indians/Alaska Natives represented 0.3%, African Americans represented 3.9%, and Hispanics represented 6.3%.<sup>15</sup> Of the 437 doctoral degrees conferred on US citizens and permanent residents in the biological and biomedical sciences in New York State in 2010, only 13% were awarded to URM students.<sup>15</sup>

Both MD and PhD programs are highly competitive and challenging to complete.<sup>16</sup> The gap in representation of minority students extends to MD/PhD programs as well. Among the 633 MD/PhD students who matriculated in 2011 nationally, African Americans represented 5.7%, Hispanics represented 6.2%, and American Indian/Alaska Natives represented only 1%.<sup>17</sup> Among the 62 MD/PhD students who matriculated in New York State during this same year, African Americans represented 8.0%, Hispanics represented 3.2%, and American Indian/Alaska Natives represented a disturbing 0%.<sup>17</sup> A 2008 study by Andriole *et al.* reviewed the characteristics of the emerging MD/PhD workforce between 2000 and 2006 and showed that 65.3% of the URM MD/PhD enrollees graduated from their programs, compared with 72.8% of White enrollees and 71.4% of Asian/Pacific Islander enrollees.<sup>16</sup> However, those who did graduate were

just as likely as the White and Asian/Pacific Islander graduates to still be planning substantial career involvement in research.<sup>16</sup>

Looking beyond the completion of the doctoral program and toward the path of becoming an independent investigator, the disparity persists in the levels of research-grant support secured by URM investigators. In 2006, only 1.8% of investigators receiving research grants from the National Institutes of Health (NIH) were African Americans, and 3.5% were Hispanic.<sup>11</sup> Among National Science Foundation research grant awardees in 2009, 2.2% were African Americans, 4.0% were Hispanic, and 0.3% were Native American/Alaska Native/Native Hawaiian/Pacific Islander.<sup>11</sup> Although the gap in representation may be explained because of a shallow applicant pool of minority students and subsequently URM investigators, a recent study suggests that other factors may be at play once these individuals are already in the pipeline toward becoming a biomedical researcher. Ginther *et al.* showed that African American applicants were significantly less likely than other applicants with comparable levels of training to successfully compete for the research-grant funding of the standard R01 type from the NIH.<sup>18</sup> Tabak *et al.* suggest that this phenomenon may be explained by 2 other factors that may be operating in tandem: (1) the effects of unconscious bias and (2) inadequate career mentorship, preparation, and awareness of research opportunities.<sup>19</sup> This work has fostered a response of well-designed efforts to foster the importance of mentoring in areas of professionalism, including building an optimal publication record, grant-writing, and navigation of the application/review process for extramural funding.<sup>20–22</sup>

## **Barriers to Recruitment and Retention of Underrepresented Minorities**

### Insufficient Career Self-Efficacy

The pattern of URM students leaving science-career paths correlates with 3 predictors of science-career commitment among URM undergraduates and graduate students that have emerged from linkages between self-efficacy, self-identification as a scientist, and internalization of values of the scientific community.<sup>23–26</sup> Self-efficacy, an individual's appraisal of his or her abilities and skills to accomplish specific tasks successfully, has shown to be a predictor of students' interest, goals, and persistence to pursue careers in STEM fields.<sup>23,25</sup> Integration with the scientific community may impact levels of self-efficacy and provide stronger motivation to

persist in science careers.<sup>23</sup> Yet, even when these students possess strong self-efficacy and are encouraged and accepted by the scientific community, they may face other barriers associated with acceptance and integration into the scientific community compared with their nonminority counterparts.<sup>23</sup> Therefore, even when URM students with high self-efficacy, interest, and ability perceive little or limited environmental support and/or barriers, they are stopped and are likely not to pursue their desired science-career path.<sup>27</sup>

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### Educational Challenges

Academic underpreparedness among URM students represents a significant factor of lack of progression in the sciences. Academic underpreparedness may be a result of circumstances where these students are both educationally and economically disadvantaged. Specifically, these circumstances may be disproportionate levels of poverty, low socioeconomic status, unfavorable school environments, the tendency to be placed in less-rigorous tracks in public schools, and lack of access to college-preparation classes that result in lower academic and career self-efficacy.<sup>27</sup> Similar patterns of academic underpreparedness are found in some low-resource rural communities and in recent immigrant groups with limited English who are adjusting to American culture under profound financial constraints. Therefore, motivation and performance vulnerability in the face of negative stereotypes and low expectations can influence the persistence of such disadvantaged and URM students in the sciences.<sup>28,29</sup>

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### Inadequate Financial Support

Although both minority and nonminority students may experience financial burdens related to debt and student loans, there is evidence that URM science undergraduate students may be particularly affected by financial concerns compared with nonminority students.<sup>30</sup> Financial need often requires students to balance academic coursework with employment, which is negatively associated with college persistence generally and with success in science programs in particular.<sup>31,32</sup> Students who may have to work in order to support themselves and/or contribute to the support of their families typically cannot voluntarily participate in laboratory-research opportunities without also taking on demanding paying jobs.<sup>33</sup> They also must take finances into consideration when applying to graduate schools that do not offer a level of financial support that is comparable to the most competitive and structured programs, which may mean the difference between being a “waitress or a scientist.”<sup>33</sup>

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A study of MD/PhD graduates from institutions with and without the National Institute of General Medical Sciences’ Medical Scientist Training Program (MSTP) showed that nonwhite MD/PhD recipients more likely graduated from long-standing MSTP-funded schools than non-MSTP-funded schools, that the proportion of graduates from non-MSTP-funded schools reported financial debt more than twice that of graduates from schools with long-standing or recent MSTP funding, and that URM students are more likely to matriculate at long-standing MSTP-funded medical schools than non-MSTP-funded schools. This study’s findings suggest that MSTP funding is essential to strengthening the diversity of the physician-scientist workforce.<sup>34</sup> Research has also shown that financial assistance in the form of graduate fellowships (including from special affirmative-action programs) and assistantships may not only greatly reduce the financial burden of students, but

also can influence the amount of interaction students have with faculty and significantly contribute to timely and successful degree completion for minority doctoral recipients.<sup>35,36</sup>

### Family Support

Obligation to community and responsibility to family are important considerations in understanding the retention of URM students in STEM disciplines.<sup>37</sup> Research on undergraduates indicates that family responsibilities that interfere with college have a consistent negative effect on academic adjustment as well as a sense of belonging for both URM and non-URM students.<sup>30</sup> Conversely, studies of the Meyerhoff Scholars Program for undergraduate minority STEM majors at the University of Maryland, Baltimore County show that continuous positive engagement of parents and an early childhood history of communicative parental support, discipline, and modeling has a strongly positive effect on success of students in the program.<sup>38</sup>

### Lack of Critical Mass of Students, Postdoctoral Fellows, and Faculty from Similar Gender and Ethnic Groups.

Underrepresented minority student recruitment and retention in higher education has been characterized as a catch-22 in which a “critical mass” of minorities is often needed to attract more minorities to an institution.<sup>39</sup> At the same time, skewed representations of a small group can result in tokenism, a term used for situations in which minority students experience negative consequences with respect to their interactions within their program and school when announced efforts to build a critical mass do not feel genuine or robust and are not embraced by the community.<sup>40</sup>

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### Social and Racial Barriers

Academic, psychological, and social factors that influence retention of URM students in undergraduate

STEM majors have been well-documented.<sup>41</sup> Evidence for efficacy of postbaccalaureate interventions suggest that such factors remain important for many URM and low-income students who enter graduate programs.<sup>22</sup> There is strong evidence that structured undergraduate research experiences and postbaccalaureate research education programs (PREPs) alleviate some of these challenges and increase student persistence in STEM disciplines.<sup>22,30,41,42</sup> These programs increase positive outcomes in STEM disciplines by offering academic and financial support to minority students by increasing their social capital in areas related to future careers in STEM.<sup>30,33,41,42</sup> However, many of these challenges may persist at the doctoral level, where feelings of social isolation and perceptions of a nonsupportive environment remain barriers to student retention.<sup>28,33,43,44</sup> There is evidence that minority graduate students overall may experience more isolation and less access to mentors and role models than their nonminority peers.<sup>45,46</sup> Findings on the general STEM doctoral student population show that as students progress further along their programs, they encounter an increasingly isolated learning environment, a “pathway to loneliness,” that is influenced by the social climate and multiple institutional agents (faculty, peers, advisors, and laboratory partners) that may engage, even unknowingly, in inclusive and exclusionary practices based upon racial, gender, socioeconomic status, or ethnic identities.<sup>43</sup> These practices can include racism, racial micro assaults, or inadvertent discrimination that create a negative racial climate and adversely impact minority student retention.<sup>35,43,47</sup> The experience of independence and adjustment to a new environment and climate may create a significant learning curve for minority graduate students as well as other students from disadvantaged backgrounds when unconscious bias is not addressed institutionally.<sup>48</sup>

### Inadequate Program Support

Inadequate program support has been documented to negatively influence URM students in STEM majors at the undergraduate level.<sup>49</sup> At the doctoral level, lack of a structured environment within programs, insufficient professional development, inconsistent mentoring, inconsistent research/career advising and guidance, changing departmental relationships, and an absence of role models may drive URM students from their programs or lengthen degree times.<sup>35,50,51</sup> Strong programs include regular faculty support, motivation, mentoring, and advising that are crucial to the success of URM students in STEM majors.<sup>38,43</sup>

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networks that support the ability of other more sophisticated or immediately comfortable students to navigate STEM pathways.<sup>43</sup> Because URM students also may hesitate to seek assistance

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when confronted by an academic or social challenge if they have not yet established mentoring relationships with one or more program faculty members or administrators, early access to culturally appropriate academic advising and mentoring at each new stage of their education is essential to retention strategies.<sup>27,35</sup> Support and encouragement from mentors who make themselves available to their mentees can ensure doctoral-program satisfaction and combat the negative effects of isolation.<sup>36</sup>

## CLIMATE CHALLENGE AND DIVERSITY

### **Relationship Between Institutional Climate and Diversity**

Climate is a complex component of any organization.<sup>52</sup> Climate is a description of people's shared perception of the quality of the environment or work unit.<sup>53</sup> It is best understood as the “personality” of the organization or the totality of the surroundings as perceived by individuals within an organization (53 in 52, PG 445). Various sectors have engaged in self-assessment in order to understand the climate as it is experienced by their workforce.

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Specifically, a number of investigations from various sectors have been helpful in understanding the climate as experienced by historically marginalized groups (eg, women, persons with disabilities, individuals of racial and ethnic minorities, and individuals who are lesbian, gay, or transgendered) or by specific workforce groups such as students or junior faculty in academia.<sup>8,9,52,54–57</sup> These investigations have contributed to a body of work that examines an organization's diversity climate in various sectors, including corporate America, science and technology, higher education, and, more recently, in academic medicine.<sup>10,39,58–63</sup> Pugh best describes an organization's diversity climate as "the employees' shared perception of the policies and practices that communicate the extent to which fostering diversity and eliminating discrimination is a priority of the organization."<sup>64</sup> Therefore, assessing the climate for diversity becomes key for organizations that wish to create comfortable, diverse working and learning environments.<sup>8,54</sup>

The challenges in diversifying the medical profession have long been known and understood.<sup>1</sup> In his 1996 presidential address at the annual meeting of the Association of American Medical Colleges, Dr Jordan Cohen noted that diversity has been sidelined and ignored by medical-education leadership and that this stance must be reversed, despite previously stalled diversity efforts by the Association of American Medical Colleges (eg, Project 3000 by 2000).<sup>2</sup> Dr Cohen's argument for seeking diversity of the medical profession was based on 5 important reasons. It would help achieve (1) just and equitable access to rewarding careers, (2) improved access to healthcare for the underinsured, (3) culturally competent care, (4) a comprehensive research agenda, and (4) the use of the rich and diverse pool of the nation's talent to better manage the healthcare system.<sup>2</sup>

Eight years later, the Institute of Medicine report titled *In the Nation's Compelling Interest: Ensuring Diversity in the Health–Care Workforce* (2004) defined the institutional climate for diversity as "the perceptions, attitudes, and expectations that define the institution, particularly as seen from the perspectives of individuals of different racial or ethnic backgrounds."<sup>4</sup> Despite these landmark statements from leading organizations in academic medicine, only during the last decade has the field of academic medicine begun to gain adequate momentum to engage in self-study directed at understanding the climate as experienced by women faculty, junior faculty, racial/ethnic minority faculty and minority medical students.<sup>1,39,60,65–72</sup>

The experience of the Center for Multicultural and Community Affairs (CMCA) at MSSM and the

results from our recent diversity-climate survey described in this article support the notion that senior leadership plays a critical role in fostering institutional climate. This notion is supported by Halpin and Cooper's 1963 work on school climates in which they suggest that leadership style is a measure of organizational climate. This work provides a basis for increasing the sensitivity of leaders at every institutional level regarding the importance of how their styles are perceived by the underrepresented individuals in their departments and divisions.

### **Efforts to Assess Climate at Mount Sinai School of Medicine**

Mount Sinai School of Medicine is closely affiliated with the Mount Sinai Hospital, which has a 150-year history of providing healthcare services to New York City's poor. Mount Sinai School of Medicine has prepared physicians and scientists since 1968, granting the doctorate of medicine and the PhD in biomedical science. Mount Sinai School of Medicine is autonomous and self-supporting with its own board of trustees. The main campus is located on the Upper East Side of Manhattan, New York City, bordered by East and Central Harlem to the east and north (2 predominantly poor, ethnic minority communities) and by Yorkville on the south (one of the nation's most affluent communities). Together, they provide a broad mix of cultural, socioeconomic, and ethnic diversity that makes the educational and health-service opportunities at Mount Sinai unique.

Mount Sinai School of Medicine is widely recognized for its excellence in education; basic, translational, and clinical research; patient care; and service to our community. We place the highest value on educating physicians and scientists who will be agents of constructive, lasting change. The graduate school comprises all degree-granting programs in basic science (PhD and MS), clinical research (PhD and MS), public health (MPH), and genetic counseling (MS). This framework increases the opportunities for graduate students to engage in translational research and to cross-register in courses outside of their own program.

A focus on diversity of students, trainees, and faculty has been a long-standing interest for MSSM. Formal programs and activities have been in place almost since the inception of the school. Attempts to understand the impact of programs aimed at improving diversity in general and the institutional climate in particular have included quantitative and qualitative methodological approaches.

### Student Focus Groups

Focus groups have been conducted regularly with minority students in the MD, MD/PhD, and PhD programs to examine their perceptions of the climate and their experiences as students at MSSM and to assess issues that need to be addressed. Themes emerging from recent focus groups with MD/PhD and PhD students are shown in Table 1.

A specific comment from a MD/PhD student about the climate at the graduate school at Mount Sinai stated, "I feel as though there was a big shift between my first 2 years in medical school

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and the beginning of my PhD with regard to [my feeling] a sense of community." A PhD student stated that she "feels a sense of isolation but will not attribute it to being a URM student." From both testimonials, the sense of isolation and the lack of belonging in a community associated with pursuit of a PhD degree were evident. Although a sense of isolation is common for most graduate students during some time in their training, given the individual nature of the PhD thesis, URM students are more sensitive to that experience. As described by Hung *et al*, feelings of isolation and seclusion play a crucial role in the retention and completion of a doctoral degree in science.<sup>39</sup> Retention of URM students in such programs in turn attracts prospective URM students.<sup>21</sup>

### Mount Sinai School of Medicine Faculty Diversity Climate Survey

With support of the Mount Sinai Survey Center, between March and April 2011, the CMCA sponsored a survey of faculty perceptions regarding diversity and awareness of key CMCA faculty programs at MSSM. The Diversity Climate Survey was the first attempt to survey MSSM faculty about their perceptions regarding diversity at MSSM. Overall, faculty perceptions about diversity at MSSM and visibility of programs to address diversity of women and racial/ethnic minorities were positive.

Also, a significant majority of faculty report that they have not experienced disrespect or unfair treatment based upon any personal characteristics. Most agreed that Mount Sinai welcomes racial and gender differences. Of interest, in most cases, the opinions of the "majority" population were more positive than the opinions of those individuals from underrepresented groups (eg, respondents who self-identify as racial/ethnic minorities or women) on all attitude questions.

Increasing the presence of women and racial/ethnic minorities in faculty and leadership positions at MSSM emerged as the one way to better impact diversity at MSSM. A product of recommendations from an action plan developed was the launching of an MSSM Diversity Council, described below.

### ADDRESSING INSTITUTIONAL CLIMATE AND DIVERSITY AT MOUNT SINAI SCHOOL OF MEDICINE

The Mount Sinai School of Medicine has invested resources to support diversity since its inception in 1968. Recognizing that achieving a critical mass of students from diverse racial and ethnic communities was important to supporting a welcoming environment, substantial efforts have developed and evolved over the past 4 decades. Below is a summary of some of the key programs and initiatives and how they connect with some of the themes raised in focus groups and the institutional climate survey. This is not an exhaustive list.

*Recognizing that achieving a critical mass of students from diverse racial and ethnic communities was important to supporting a welcoming environment at the Mount Sinai School of Medicine, substantial efforts have developed and evolved at the school over the past 4 decades.*

### **Institutional Diversity Programs**

#### Center for Excellence in Youth Education.

From its inception in 1968, MSSM set out to increase access of individuals from groups underrepresented in the health professions by

**Table 1.** *Themes From Focus Groups With MSSM Minority MD, MD/PhD, and PhD Students.*


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Enrichment programs were considered valuable, but occasionally they made some students feel they were perceived as not deserving acceptance to the graduate school.

Some students noted occasional negative student and faculty remarks (eg, perception that they are not as qualified or welcome), particularly with some PhD students or groups.

Universally the MSSM campus environment was considered positive and supportive.

The environment was noted to be welcoming, but occasional negative experiences were shared.

In general, students noted positive experiences with research and other academic mentors.

Several individuals, groups, and programs were highlighted as exemplary in providing additional support or guidance to students.

There was general consensus that research-laboratory experiences were isolating.

On rare occasions, a negative incident was noted and was perceived to be based on a bias (race/ethnicity).

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**Abbreviations:** MSSM, Mount Sinai School of Medicine.

establishing a prematriculation summer enrichment course for incoming disadvantaged students and by establishing partnerships with the New York City public schools to prepare disadvantaged students early on for college and for careers in the health professions. The Health Careers Opportunity Program (HCOP, 1968–1972) evolved into the Secondary Education Through Health (SETH) Program in 1973 with HCOP support. These programs became MSSM's Center for Excellence in Youth Education (CEYE) in 1988. The CEYE has expanded its high-school programs to form new collegiate programs. Mount Sinai School of Medicine preprofessional programs for disadvantaged youth are both experiential and didactic hands-on biomedical science enrichment courses rounded with clinical and bench research experiences, exposing disadvantaged students to the broadest and most up-to-date knowledge and practice. These motivating experiences hone student interest and bolster their competitiveness for college and health professional school. More than 10,000 preprofessional disadvantaged students have successfully completed the MSSM pipeline programs. More than 100 have become physicians, and more than 2000 have found careers in the healthcare field as nurses and allied health workers.

The year-round programs at CEYE include the New York State Science and Technology Entry Program (STEP), the BioScience Studies Institute, the Collegiate Careers in Medicine and Research Program, and SAT and Medical College Admissions Test prep programs. The Center for Excellence in Youth Education is also the program host for the Mount Sinai arm of the Northeast Regional Alliance (NERA) HCOP, the most recently launched educational pipeline partnership between 3 major medical schools and a regional Area Health Education Center: MSSM, Columbia College of Physicians and Surgeons, and the Manhattan–Staten Island Area Health Education Center. Approximately 300 minority and

disadvantaged students participate in this program each summer across the partnership campuses.

More than 95% of CEYE's high school students go on to college. These programs regularly yield 2–4 college graduates who matriculate at MSSM each year. The CEYE works with and through the CMCA to implement HCOP activities. Underrepresented minority MD/PhD and PhD students are increasingly participating as teaching assistants in these programs to expand their involvement in service, to engage with a wider campus community, and to support expanding interests of youth in MD/PhD and PhD careers.

### Summer Enrichment Prematriculation Program

Mount Sinai School of Medicine has a long-standing prematriculation program, initially targeting educationally and economically disadvantaged students. The Summer Enrichment Program (SEP) is currently available to any student accepted to MSSM who has had “disrupted” formal college education, making it less focused as a diversity initiative. On occasion, students self-select to participate if they believe they would benefit from a 6-week immersion program during the summer before first-year studies begin. Study skills, critical thinking, and learning approaches to these courses are emphasized. Outcomes from the SEP, when it was a primarily a diversity-targeted program, have shown that minority students who participated had higher passing rates on basic science examinations (all first- and second-year courses) and greater success rates on first-time passing of the US Medical Licensing Examination, STEP I examination than minority students who did not participate in SEP. Perhaps even more important is the impact that the program has had in helping URM participants feel more comfortable in a large academic environment and to begin to develop networks of support early.

### Center for Multicultural and Community Affairs

The Office for Multicultural and Community Affairs was established in 1998 in an effort to expand and improve coordination of existing diversity efforts. As the office expanded programs and funding to target faculty, it was granted Center status. Currently, the CMCA is the interface for CEYE programs, Minority Affairs, institution-wide diversity initiatives, academic support for medical students, and culture and medicine programs with MSSM. The CMCA is currently a Health Resources and Services Administration-funded Center of Excellence (COE) for Minority Health (initial funding in 2002 and renewed in 2009) and is the administrative home for our Comprehensive NERA HCOP. The COE expands our focus on graduate medical education, faculty diversity, and targeted support for medical students in academic medicine and research affecting minority communities. Medical students are exposed to community health, primary care, and health services research.

Targeted CMCA initiatives have helped to substantially increase the percentage of URM matriculants in the medical school and residency training programs and on faculty. The CMCA has supported maintaining approximately 20% MSSM student body enrollment of students from URM groups since 2005 and has helped to increase the percent of Black and Hispanic residents in Mount Sinai training programs from 5% in 1998 to more than 12% in 2011. Since 2001, when CMCA was established, there has been a growth in Black and Hispanic faculty from 4% in 2001 to almost 8% in 2012. In addition, CMCA efforts have helped increase the representation of URM medical students in mentored research participating at the same level as their nonminority counterparts in a 6- to 8-week summer mentored research experience. Improved diversity has established a critical mass of URM students in the medical school, which has been helpful in establishing a network of support for URM graduate students to minimize their sense of isolation on campus. The CMCA faculty also provide formal and informal mentoring and advising for graduate students, medical students, postdoctoral trainees, and faculty to minimize their perceptions of social isolation.

The CMCA also conducts an Urban Health Grand Rounds; an annual symposium on health disparities; a graduate course on culture, health, and illness; a Health Disparities Journal Club for second-year medical students; and a Language Proficiency in Health Care Program for medical students who wish to participate in medical Spanish and medical

Mandarin. Underrepresented minority MD/PhD and PhD students participate in many of these activities, which serve as important bridges to a wider network of URM students and faculty, also helping to address isolation and perceptions of unwelcome.

### Center for Multicultural and Community Affairs Faculty Scholars Program

The CMCA Faculty Scholars Program (FSP) was established to equip URM faculty with the tools and information necessary for success in academic medicine. It was developed in 2001 to address concerns from URM faculty about their unique challenges as minority faculty, the perceived uneven playing field, and challenges in thriving in academic-medical-center culture. The FSP has engaged more than 60 junior faculty in formal research training and academic-development programs (26 of whom received a stipend with support from a Health Resources and Services Administration COE grant) and supported more than 60 predoctoral students in mentored research over the past 10 years. Fourteen scholars have participated in either the MSSM-sponsored master of science in clinical research or master of public health programs. The FSP also targets URM PhD faculty to provide support for professional development and assist in broadening formal and informal networks among other URM and non-URM faculty.

### Mount Sinai Postbaccalaureate Research Education Program

Mount Sinai's NIH-funded Postbaccalaureate Research Education Program (Mount Sinai PREP), which is described elsewhere in detail, has also had a major impact on institutional diversity. This diverse group of research scholars participates in laboratory research, some courses, and many institutional activities.<sup>22</sup> Targeted efforts are included to enhance networking with faculty and other students help address feelings of isolation. In addition, Mount Sinai PREP alumni account for approximately half of the URM participants in the institutional MD/PhD program and about 15% of the URM participants in the PhD program, and other Mount Sinai PREP alumni have entered further research training in other programs around the country. Further, some Mount Sinai PREP alumni are in MD training, with continued research participation, here and elsewhere.

### Summer Undergraduate Research Program

The MSSM Summer Undergraduate Research Program (SURP) is a 10-week summer research internship

for undergraduate students interested in pursuing an MD/PhD or a PhD who would like an intensive research experience at a major academic medical center. Successful SURP fellows are invited to apply for early acceptance to the PhD or MD/PhD program. Participation in this program allows students an earlier introduction to the MSSM academic environment and networking opportunities with other students and faculty and also helps support a welcoming climate. Increasing the diversity of candidates in SURP also supports an increase in the diversity of the pool of applicants to the MSSM MD/PhD and PhD programs, which can also impact climate perceptions.

### Humanities and Medicine Program

The Humanities and Medicine Program is a unique MSSM early admissions program that allows highly motivated undergraduate students to explore their interests in humanities and social sciences before coming to medical school. Taking the MCAT is not required. Students apply to the program in the first semester of their sophomore year. In addition to a required summer program after sophomore year, the 6-week SEP described above is available for these students. Over time, as participants in this program have become increasingly diverse, the program has become an important vehicle for supporting diversity of the overall medical student body and helped to introduce participants to the MSSM community much earlier, which can also impact perceptions of institutional climate.

## **Other Organized Institutional Diversity Efforts**

### Diversity Leadership Committee.

The Diversity Leadership Committee (DLC) was established in 2002 as a CMCA internal oversight committee. The DLC is charged with increasing recruitment of minority house staff, monitoring recruitment outcomes by department, and examining barriers and challenges toward retaining minority house staff to transition to faculty positions. The DLC has been instrumental in supporting development of targeted, systematic activities to support increases in diversity of MSSM house staff and faculty. The DLC has been critical to making focus on house staff and faculty diversity a priority for departments. This has been a valuable venue for developing and reviewing departmental diversity metrics. Notable increases in house staff diversity are apparent in most departments as a result of the work of the DLC.

### Center for Multicultural and Community Affairs Outreach, Recruitment, and Retention Council

The CMCA launched the Outreach, Recruitment, and Retention Council (ORRC) in 2008 to improve coordination of outreach, recruitment, and retention activities for candidates from URM groups across the graduate and medical schools, pipeline programs, graduate medical education, and postdoctoral programs.

The ORRC is coordinated by CMCA and includes representatives from admissions, the graduate school, the Department of Medical Education, and Graduate Medical Education to focus on such efforts throughout the pipeline from prematriculation through postgraduate training for physician and nonphysician scientists. Among many other of its efforts, an Ambassador Program has paired URM alumni from various colleges and universities with faculty recruiters to visit the campuses from which successful alumni have already entered Mount Sinai. The ORRC has supported URM graduate students in having an active role in supporting diversity outreach.

### Diversity in Biomedical Research Committee

The Diversity in Biomedical Research Committee (DBRC) was established in 2008 by the dean as part of a series of strategic directions to increase the diversity of the biomedical research workforce and research activities related to minority health to develop a minority-health research agenda at MSSM. Building a diverse and inclusive group of leaders, faculty, postdoctoral fellows, students, and staff at MSSM and its community of affiliated hospitals is of great importance to the school's mission of advancing science and medicine through excellence in research and patient care. The DBRC aims to develop sustainable strategies that promote diversity in biomedical research in 2 distinct areas: expansion of the presence of URM research faculty and trainees at Mount Sinai and expansion of research focused on minority health. It is through these strategies that Mount Sinai's commitment to diversity will ensure excellence in training, biomedical research, and patient care. Members from the DBRC have worked with CMCA to develop regular gatherings for URM graduate students and postdoctoral trainees to begin to develop strategies to address issues raised from focus groups. The plan for establishing Students for Equal Opportunity in Science (SEOS), discussed below, was an important product of these meetings.

## **Newly Emerging Mount Sinai School of Medicine Initiatives That Address Institutional Climate**

### Students for Equal Opportunity in Science

The value of student perceptions of climate and recommendations for potential interventions to improve institutional climate and diversity cannot be overestimated. Students for Equal Opportunity in Science is a newly formed minority graduate student organization and is advised by the CMCA and DBRC leadership. Students for Equal Opportunity in Science aims to increase recruitment efforts targeted toward and retention of URM students in MSSM graduate-sponsored programs and address isolation that is felt by PREP scholars by encompassing them in the SEOS group and making them partners in the effort of targeting many of the general institutional barriers noted above. The creation and sustenance of URM graduate student organizations that enhance a sense of camaraderie as well as eliminate feelings of isolation in graduate school programs is critical to the retention and recruitment of students—and, as a result, important to increasing diversity. Moreover, SEOS students engage in community service where they help children in underprivileged areas appreciate fun aspects of science and serve as their role models, which in turn impacts self-efficacy. Enhancing visibility of URM students throughout the institution and community also helps with retention and recruitment.

Minority graduate student organizations increase retention of graduate students by augmenting interactions through social events and workshops that promote discourse and address the concerns and challenges encountered by these students. Through these events, effective strategies can be designed and employed to address such concerns. For example, workshops that address funding opportunities during graduate and postgraduate training can make a difference by raising awareness of minority students.

Apart from increasing retention of students, minority student organizations play a crucial role in the recruitment of URM students to graduate school. By working very closely with administrative officials, members of such organizations can participate in the planning, shaping, and execution of strategies designed to increase recruitment. Such strategies might include organizing recruitment engagements at national conferences such as the Annual Biomedical Research Conference for Minority Students, developing outreach efforts through workshops at high schools and colleges that inform students of skills and experiences necessary to become a competitive PhD applicant,

describing the socioeconomic and cultural benefits of becoming a researcher, as well as highlighting the accomplishments of URM researchers and their impact on society. Other outreach efforts could focus on creating pipeline programs that expose high school students to research through engagement in faculty-supervised summer research projects. Through these programs, graduate students could provide mentorship and serve as role models.

### Mount Sinai School of Medicine Diversity Council

In response to our first faculty Diversity Climate Survey, a major recommendation from the action plan was to establish a Diversity Council that reports to the dean.

The council's mission is to promote diversity in faculty recruitment, retention, development, and inclusion at Mount Sinai. In an effort to support institutional excellence, the council will support the development, implementation, and monitoring of specific activities to increase the representation and advancement of ethnic minority and women faculty members in all departments, institutes, and the medical school administration. The council will include senior-level faculty representatives (diversity liaisons) from all departments and institutes and will aim to enhance faculty diversity at all levels, including clinical and basic science faculty.

Council liaisons will serve as departmental and institute liaisons to the council and assist in developing, implementing, and monitoring of departmental and institute diversity metrics (eg, trends, climate, faculty mentoring, and advancement) to support an annual report of departmental and institute performance; develop specific departmental action plans under guidance of department chairs, with support from the Council and other MSSM resources; and share best practices for enhancing faculty diversity, retention, development, and advancement.

### Integration of Diversity Efforts

As we continue to develop and regularly review and evaluate the impact of diversity programs, our approach, conversation, and degree of inclusion at MSSM has matured. Discussions among leadership are less focused on rationalizing the value of diversity, but rather on how we make the institution stronger with diversity as a key driver for excellence. At MSSM, shared leadership and responsibility for diversity are emerging. For example, outreach and recruitment planning and activities include the

leadership from admissions, student affairs, the Department of Medical Education, and the graduate school working collaboratively with the CMCA to ensure coordination of effective strategies based on data. Additionally, focus on including diverse participants on major MSSM committees has become the routine, and programs such as the Humanities in Medicine Program and our SURP noted above have made diversity of participants a priority.

## LESSONS LEARNED

Challenges to addressing diversity in biomedical research are persistent, and though there are some unique factors relating to the research pipeline and experiences for URM faculty in research, many of the barriers noted in this article are similar to those identified for addressing diversity in medicine and business. Institutional climate plays a significant role in impacting efforts to improve diversity. Addressing institutional climate may help to develop a critical mass of diverse groups of students, faculty, and trainees, which in turn creates an ongoing experience of inclusion.

From our work over 4 decades, we have learned several important lessons that may be of value for other leaders interested in improving diversity in their institutions. They include:

1. Leadership should regularly and publicly present a clear message in support of diversity and identify those accountable for creating a climate for diversity and inclusion.
2. Interventions should be based on identified barriers in general and specific to the institution and guided by data and information available.
3. A comprehensive plan should be developed to both assess relevant issues and challenges and regularly monitor the impact of interventions.
4. Broader assessment methods, including climate surveys and focus groups, may be of particular value in appreciating the issues which need to be addressed, in addition to trends data.
5. Building on institutional history and successes and acknowledging the successes of other diversity efforts are important.
6. Including students and postdoctoral fellows in the process of promoting diversity can be important for empowerment and helping them reduce feelings of isolation.
7. Building a diverse community should be based on institutional values of diversity and inclusion that are aligned with institutional missions to support excellence.

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## DISCLOSURES

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