



Published in final edited form as:

*Mt Sinai J Med.* 2012 July ; 79(4): 498–511. doi:10.1002/msj.21323.

## ROLE OF INSTITUTIONAL CLIMATE IN FOSTERING DIVERSITY IN BIOMEDICAL RESEARCH WORKFORCE: A CASE STUDY

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### Abstract

This article reviews the barriers to diversity in biomedical research, describes the evolution and efforts to address climate issues to enhance the ability to attract, retain and develop underrepresented minorities (URM) - 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 (MSSM). We also describe the potential beneficial impact of having a climate that supports diversity and inclusion in the biomedical research workforce. MSSM diversity climate efforts are discussed as part of a comprehensive plan to increase diversity in all institutional programs PhD, MD/PhD, MD, and at the residency, post doctoral fellow, and faculty levels. Lessons learned from four decades of targeted programs and activities at MSSM may be of value to other institutions interested in improving diversity in the biomedical science and academic medicine workforce.

### Keywords

biomedical research; workforce; diversity; underrepresented minorities; institutional climate

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**Conferences at which some or all content originated:** None.

**Disclosures:** No potential conflict of interest.

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.(1–4) The Institute of Medicine has also connected recommendations for healthcare workforce and research diversity to supporting efforts to reduce health disparities and increase culturally sensitive and appropriate healthcare.(4)

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.(1, 2, 5) That said, the challenges to increasing diversity in biomedicine have been substantial and persistent. Notable barriers include historical challenges and systemic factors.(1, 6, 7) 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.(8–10)

This paper 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 (URM) to biomedical research doctoral programs (PhD and MD/PhD) at MSSM. These efforts are part of a comprehensive plan to increase diversity in all MSSM institutional programs including the Doctorate of Medicine (MD) program, post-graduate residency training, and among post doctoral 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.(11–13) Students from these racial and ethnic groups made significant gains at the baccalaureate and master's levels across all fields during the 1990s. (14) However, their rates of PhD attainment across all fields remain well below their representation in the doctoral-age population.(14) While 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. (11) Of the 5,577 total doctorates awarded to US citizens and permanent residents in the biological and biomedical sciences in 2010, 10.5% were awarded to URSM students. Specifically, American Indians/Alaska Natives comprised 0.3%, while African Americans comprised 3.9% and Hispanics comprised 6.3%.(15) Of the 437 doctoral degrees conferred to US citizens and permanent residents in the biological and biomedical sciences in New York State in 2010, URM students comprised only 13%.(15)

MD/PhD programs are highly competitive and challenging to complete.(16) 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 comprised 5.7%, Hispanics comprised 6.2%, and American Indian/Alaskan Natives comprised only 1%. (17) Among the 62 MD/PhD students who matriculated in New York State during this same year, African American comprised 8.0%, Hispanics comprised 3.2%, and American/Indian/Alaskan Natives comprised a disturbing 0%. (17) Andriole et al. (2008) study characterized

the characteristics emerging MD/PhD workforce between 2000 and 2006 and showed that 65.3% of the URM MD/PhD enrollees graduated from their programs, compared to 72.8% of White enrollees and 71.4% of Asian/Pacific Islander enrollees.(16) 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.(16)

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. (11) Among National Science Foundation research grant awardees in 2009, 2.2% were awarded to African Americans, 4.0% were awarded to Hispanic, and 0.3% were awarded to Native American/Alaska Native/Native Hawaiian/Pacific Islander.(11) While 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 towards becoming a biomedical researcher. Ginther et al (2011) work 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. (18) Tabak et al (2011) suggest that this phenomenon may be explained by two 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.(19) 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.(20–22)

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

**Insufficient Career Self-Efficacy**—The pattern of URM students leaving science career paths correlates with three 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.(23–26) 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.(23, 25) Integration with the scientific community may impact levels of self-efficacy and provide stronger motivation to persist in science careers.(23) 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 to their non-minority counterparts. (23) 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 pursue their desired science career path.(27)

**Educational Challenges**—Academic under-preparedness among URM students represents a significant factor of lack of progression in the sciences. Academic under-preparedness 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 (SES), 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.(27) Similar patterns of academic under-preparedness are found in some low-resource rural communities and in recent immigrant groups who are limited English speaking and 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.(28, 29)

**Inadequate Financial Support**—Although both minority and non-minority 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 non-minority students.(30) 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. (31, 32) Students who may have to work in order to support themselves and/or contribute to support of their families typically cannot voluntarily participate in laboratory research opportunities without also taking on demanding paying jobs.(33) 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.”(33)

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.(34) 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 can influence the amount of interaction students have with faculty and significantly contribute to timely and successful degree completion for minority doctoral recipients. (35, 36)

**Family Support**—Obligation to community and responsibility to family are important considerations in understanding the retention of URM students in STEM disciplines.(37) 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.(30) 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.(38)

**Lack of “Critical Mass” of Students, Postdocs, and Faculty from Similar Gender and Ethnic Groups**—URM 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.(39) 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.(40)

**Social and Racial Barriers**—Academic, psychological and social factors that influence retention of URM students in undergraduate STEM majors have been well-documented.(41) Evidence for efficacy of post-baccalaureate interventions suggest that such factors remain

important for many URM and low-income students who enter graduate programs.(22) There is strong evidence that structured undergraduate research experiences (SUREs) and post-baccalaureate research education programs (PREPs) alleviate some of these challenges and increase student persistence in STEM disciplines. (22, 30, 41, 42) 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.(42) (30, 33, 41) However, many of these challenges may persist at the doctoral level, where feelings of social isolation and perceptions of a non-supportive environment remain barriers to student retention.(28, 33, 43, 44) There is evidence that minority graduate students overall may experience more isolation and less access to mentors and role-models than their non-minority peers. (45, 46) 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 lab mates) that may engage, even unknowingly, in inclusive and exclusionary practices based upon racial, gender, socioeconomic status, or ethnic identities.(43) These practices can include racism, racial micro assaults, or inadvertent discrimination that create a negative racial climate and adversely impact minority student retention.(35, 43, 47) 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. (48)

**Inadequate Program Support** Inadequate program support has been documented to negatively influence URM students in STEM majors at the undergraduate level.(49) At the doctoral level, lack of a structured environment within programs, insufficient professional development, inconsistent mentoring, research/career advising and guidance, departmental relationships and an absence of role models may drive

URMs from their programs or lengthen degree times. (35, 50, 51) Strong programs include regular faculty support, motivation, mentoring, and advising that are crucial to the success of URM students in STEM majors.(38, 43) URM and disadvantaged students often are less able to access informal networks that support the ability of other more sophisticated or immediately comfortable students to navigate STEM pathways.(43)

Since URM students also may hesitate to seek assistance 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 are essential to retention strategies.(27, 35) Support and encouragement from mentors who make themselves available to their mentees can ensure doctoral program satisfaction and combat the negative effects of isolation. (36)

## **CLIMATE CHALLENGE AND DIVERSITY**

### **Relationship between Institutional Climate and Diversity**

Climate is a complex component of any organization. (52) Climate is a description of people’s shared perception of the quality of the environment or work unit (53). It is best understood as the organizational “personality” of the organization or the totality of the surroundings as perceived by individuals within an organization. (52, 53)

Various sectors have engaged in self-assessment in order to understand the climate as experienced by their workforce. Specifically, a number of investigations from various sectors have been helpful in understanding the climate as experienced by historically

marginalized groups (e.g. women, disabled individuals, racial and ethnic minority individual, and lesbian, gay, or transgendered individuals) or by specific workforce groups such as students or junior faculty in academia. (8, 9, 52, 54–57) 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. (10, 39, 58–63) Pugh (2008) 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."(64) Therefore, assessing the climate for diversity becomes key for organizations that wish to create comfortable, diverse work and learning environments. (8, 54)

The challenges in diversifying the medical profession have long been known and understood. (1) In his 1996 Presidential Address at the annual meeting Association of American Medical Colleges (AAMC), 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 AAMC diversity efforts (e.g Project 3000 by 2000). (2) Dr. Cohen's argument for seeking diversity of the medical profession was based on five important reasons that would help achieve: 1) just and equitable access to rewarding careers, 2) improved access to health care 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 health care system.(2)

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. (4) Despite these landmark statements from leading organizations in academic medicine, only during the last decade has the field of academic medicine began 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. (1, 39, 60, 65–72)

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

MSSM is closely affiliated with the Mount Sinai Hospital, which has a 150-year history of healthcare service to New York City's poor. MSSM has prepared physicians and scientists since 1968, granting the Doctorate of Medicine and the PhD in Biomedical Science. MSSM 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 (two 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, socio-economic, and ethnic diversity that makes the educational and health service opportunities at Mount Sinai unique.

MSSM 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.

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. (See 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 two years in medical school 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 (2007).(39) Retention of URM students in such programs in turn attracts prospective URM students. (21)

**MSSM 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 (e.g. 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 a MSSM Diversity Council described below.

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

MSSM 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 four 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.

### Institutional Diversity Programs

**Center of Excellence for Youth Education**—From its inception (1968), MSSM set out to increase access of individuals from groups under-represented in the health professions by establishing a pre-matriculation 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 programs (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. CEYE has expanded its high school programs to form new collegiate programs. MSSM pre-professional programs for disadvantaged youth are both, experiential and didactic hands-on biomedical science enrichment courses were rounded with clinical and bench research experiences exposing disadvantaged students to the broadest and most up-to-date knowledge and practice. These motivating experiences honed student interest and bolstered their competitiveness for college and health professional school. Over 10000 pre-professional disadvantaged students have successfully completed the MSSM pipeline programs. More than 100 have become physicians and over 2,000 have found careers in the health field as nurses and allied health workers.

CEYE’s year-round programs include: STEP, the BioScience Studies Institute, a Collegiate Careers in Medicine and Research Program, and SAT and MCAT Prep Programs. CEYE is also the program host for the Mount Sinai arm of the Northeast Regional Alliance (NERA) Health Careers Opportunity Program (HCOP), the most recently launched educational pipeline partnership between 3 major medical schools and a regional Area Health Education Center – Mount Sinai School of Medicine, 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.

Over 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. CEYE works with and through the CMCA to implement HCOP activities. URM 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 Pre-Matriculation Program**—MSSM has a long-standing Pre-Matriculation 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 USMLE, STEP I examination than minority students who did not participate in SEP. Perhaps an even more important is the impact 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 the MSSM. CMCA is currently a Health Resources and Services Administration (HRSA) 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, residency training programs and on faculty. CMCA has supported maintaining approximately 20% MSSM student body enrollment of students from URM groups since 2005; helped to increase the percent of Black and Hispanic residents in Mount Sinai training programs from 5% in 1998 to over 12% in 2011; and 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 as their non-minority counterparts in a 6–8 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. 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.

CMCA also conducts an Urban Health Grand Rounds, an annual symposium on health disparities, a graduate course on cultural, 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. URM 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.

**CMCA Faculty Scholars Program**—The CMCA 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 over 60 junior faculty in formal research training and academic development programs, 26 of which were stipended with support from a HRSA COE grant, and supported over 60 pre-doctoral 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 and provides support for professional development and assists in broadening formal and informal networks among other URM and non-URM faculty.

**Mount Sinai Post-Baccalaureate Research Education Program**—Mount Sinai's NIH-funded Post-baccalaureate Research Education Program (Mount Sinai PREP), which is described elsewhere in detail, has also had a major impact on institutional diversity, both by the presence of this diverse group of research scholars, participating in laboratory research, some courses, and many institutional activities. (22) 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, while 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 or interested in 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 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 MSSM MD/PhD and PhD programs which can also impact climate perceptions.

**Humanities and Medicine Program**—The Humanities and Medicine Program is a unique early MSSM admissions program that allows highly motivated undergraduate students to explore their interests in humanities and social sciences before coming to medical school. MCAT's are 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 Summer Enrichment Pre-Matriculation Program (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 helps introduce participants to the MSSM community much earlier which can also impact on perceptions of institutional climate.

### Other Organized Institutional Diversity Efforts

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

**CMCA Outreach, Recruitment and Retention Council**—CMCA launched the 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 post doctoral programs

The ORRC is coordinated by CMCA and includes representatives from Admissions, the Graduate School, the Dept. Medical Education, and Graduate Medical Education to focus on such efforts throughout the pipeline from pre-matriculation thru post-graduate training for physician and non-physician 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 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 two distinct areas: 1. Expansion of the presence of minority and underrepresented research faculty and trainees at Mount Sinai and 2. Expansion of research focused on minority health. It is through these strategies by which 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 URSM 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. SEOS is a newly formed minority graduate student organization and is advised by the CMCA and DBRC leadership. SEOS aims to increase recruitment efforts targeted towards 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 for 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 (ABRCMS), 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 which 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 (e.g. 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, 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 Summer Undergraduate Research Program (SURP) noted above have included diversity of participants in these programs a priority.

## LESSONS LEARNED

Challenges to addressing diversity in biomedical research are persistent and while 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 four decades, we have learned several important lessons which 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. Build on institutional history and successes, acknowledging the successes of other diversity efforts is important;
6. Include students and post-doc fellows in the process of promoting diversity which can be important in helping them to reduce feelings of isolation and to empower them;
7. Building a diverse community should be based on institutional values of diversity and inclusion which are aligned with institutional missions to support excellence

## Acknowledgments

Contributions to this article from projects of the authors were supported by grants D34HP1645 (Center of Excellence) and D18HP10627 (Health Careers Opportunity Program) from Health Resources Services Administration Bureau of Health Professions (to GCB) and R01 GM081221 (to TAK) from the National Institutes of Health.

## References

1. Nivet MA. Minorities in academic medicine: Review of the literature. *Journal of Vascular Surgery*. 2010; 51(4):S53–S58.
2. Cohen JJ. Finishing the bridge to diversity. *Academic Medicine*. 1997; 72(2):103. [PubMed: 9040244]
3. Cohen JJ, Gabriel BA, Terrell C. The case for diversity in the health care workforce. *Health Affairs*. 2002; 21(5):90–102. [PubMed: 12224912]
4. Smedley, BD.; Butler, AS.; Bristow, LR. Ensuring diversity in the health-care workforce. *Natl Academy Pr*; 2004. In the nation's compelling interest.
5. Smith, DG. Making it work. *Johns Hopkins Univ Pr*; 2009. Diversity's promise for higher education.

6. Nivet MA, Taylor VS, Butts GC, Strelnick AH, Herbert-Carter J, Fry-Johnson YW, et al. Diversity in academic medicine no. 1 case for minority faculty development today Mount Sinai. *Journal of Medicine: A Journal of Translational and Personalized Medicine*. 2008; 75(6):491–498.
7. Butts GC. Diversity in academic medicine: Call to action. *Mount Sinai Journal of Medicine: A Journal of Translational and Personalized Medicine*. 2008; 75(6):489–490.
8. Hurtado S, Carter DF, Kardia D. The climate for diversity: Key issues for institutional self-study. *New Directions for Institutional Research*. 1998; 1998(98):53–63.
9. Mayhew MJ, Grunwald HE, Dey EL. Curriculum matters: Creating a positive climate for diversity from the student perspective. *Research in Higher Education*. 2005; 46(4):389–412.
10. Kossek EE, Zonia SC. Assessing diversity climate: A field study of reactions to employer efforts to promote diversity. *Journal of organizational behavior*. 1993; 14(1):61–81.
11. America's Science and Technology Talent at the Crossroads. Vol. xv. Washington: National Academies Press; 2011. Expanding Underrepresented Minority Participation; p. 269
12. Augustine, NR. Rising above the gathering storm: Energizing and employing America for a brighter economic future. National Academy of Science, National Academy of Engineering, Institute of Medicine, National Academy Press; Washington, DC: 2005.
13. NRC. Assessment of NIH Minority Research and Training Programs: Phase 3. Washington, D.C: National Research Council (NRC). Committee for the Assessment of NIH Minority Research Training Programs. National Academy of Sciences; 2005.
14. Diversity & the PhD: A Review of Efforts to Broaden Race & Ethnicity in US Doctoral Education. The Woodrow Wilson Fellowship Foundation; Princeton, NJ: May. 2005
15. National Science Foundation (NSF), National Center for Science and Engineering Statistics (NCSES). Doctorate Recipients from US Universities, 2010 (Table 22). Arlington, VA: Dec. 2011 (NSF 12-305)
16. Andriole DA, Whelan AJ, Jeffe DB. Characteristics and career intentions of the emerging MD/PhD workforce. *JAMA: the journal of the American Medical Association*. 2008; 300(10):1165–1173. [PubMed: 18780845]
17. Table 34: MD/PhD Matriculants to US Medical Schools by Hispanic of Latino Ethnicity, Non-Hispanic or Latino Race, and State of Legal Residence. Association of American Medical Colleges; 2011. <https://http://www.aamc.org/data/facts/enrollmentgraduate/>
18. Ginther DK, Schaffer WT, Schnell J, Masimore B, Liu F, Haak LL, et al. Race, ethnicity, and NIH research awards. *Science*. 2011; 333(6045):1015–1019. [PubMed: 21852498]
19. Tabak LA, Collins FS. Weaving a richer tapestry in biomedical science. *Science*. 2011; 333(6045): 940–941. [PubMed: 21852476]
20. DePass, A.; Chubin, D. Understanding interventions that encourage minorities to pursue research careers: Building a community of research and practice. Bethesda, MD: American Society for Cell Biology; 2009.
21. Franco I, Bailey LAO, Bakos AD, Springfield SA. The Continuing Umbrella of Research Experiences (CURE): A model for training underserved scientists in cancer research. *Journal of Cancer Education*. 2011; 26(1):92–96. [PubMed: 20568030]
22. Krulwich TA, McGee R, Saran S. Diversity in the Biomedical Research Workforce: Developing Talent. *Mount Sinai Journal of Medicine*. 2012 In press.
23. Estrada M, Woodcock A, Hernandez PR, Schultz P. Toward a model of social influence that explains minority student integration into the scientific community. *Journal of educational psychology*. 2011; 103(1):206. [PubMed: 21552374]
24. Chemers MM, Zurbriggen EL, Syed M, Goza BK, Bearman S. The role of efficacy and identity in science career commitment among underrepresented minority students. *Journal of Social Issues*. 2011; 67(3):469–491.
25. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. *Psychological review*. 1977; 84(2):191. [PubMed: 847061]
26. Lent RW, Brown SD, Hackett G. Toward a unifying social cognitive theory of career and academic interest, choice, and performance. *Journal of vocational behavior*. 1994
27. Association AS-L-H. Minority student recruitment, retention and career transition practices: A review of the literature. Retrieved on June 2007;21

28. Summers MF III, FAH. Preparing minority scientists and engineers. institutions. 2006; 17:18.
29. Steele CM, Aronson J. Stereotype threat and the intellectual test performance of African Americans. *Journal of Personality and Social Psychology*; *Journal of Personality and Social Psychology*. 1995; 69(5):797.
30. Hurtado S, Han JC, Saenz VB, Espinosa LL, Cabrera NL, Cerna OS. Predicting transition and adjustment to college: Biomedical and behavioral science aspirants' and minority students' first year of college. *Research in Higher Education*. 2007; 48(7):841–887.
31. Callan P. Equity in higher education: The state role. *Minorities in higher education*. 1994:334–346.
32. Garrison HH. Undergraduate science and engineering education for Blacks and Native Americans. 1987; 1987:39–72.
33. Gasiewski, J.; Tran, MC.; Herrera, F.; Garcia, GA.; Newman, CB. Barricades, Bridges, and Programmatic Adaptation: A Multi-campus Case Study of STEM Undergraduate Research Programs.
34. Jeffe DB, Andriole DA. A national cohort study of MD PhD graduates of medical schools with and without funding from the National Institute of General Medical Sciences' Medical Scientist Training Program. *Academic Medicine*. 2011; 86(8):953. [PubMed: 21694566]
35. MacLachlan, AJ. A Longitudinal Study of Minority PhDs from 1980–1990: Progress and Outcomes in Science and Engineering at the University of California during Graduate School and Professional Life. Center for Studies in Higher Education; UC-Berkeley: 2004. Final Report to the Spencer Foundation Grant No. 200000265.
36. Nettles MT. Success in doctoral programs: Experiences of minority and white students. *American Journal of Education*. 1990:494–522.
37. White JL, Altschuld JW, Lee YF. Cultural Dimensions in Science, Technology, Engineering and Mathematics: Implications for Minority Retention Research. *Journal of Educational Research & Policy Studies*. 2006; 6(2):19.
38. Maton KI, Hrabowski FA III. Increasing the Number of African American PhDs in the Sciences and Engineering< xh: i> A Strengths-Based Approach</xh: i>. *American Psychologist*. 2004; 59(6):547. [PubMed: 15367090]
39. Hung R, McClendon J, Henderson A, Evans Y, Colquitt R, Saha S. Student perspectives on diversity and the cultural climate at a US medical school. *Academic Medicine*. 2007; 82(2):184. [PubMed: 17264699]
40. Kanter RM. Some effects of proportions on group life: Skewed sex ratios and responses to token women. *American journal of Sociology*. 1977:965–990.
41. Perna L, Lundy-Wagner V, Drezner ND, Gasman M, Yoon S, Bose E, et al. The contribution of HBCUs to the preparation of African American women for STEM careers: A case study. *Research in Higher Education*. 2009; 50(1):1–23.
42. Barlow AEL, Villarejo M. Making a difference for minorities: Evaluation of an educational enrichment program. *Journal of Research in Science Teaching*. 2004; 41(9):861–881.
43. Gasiewski, J.; FH; CMM; SH; CM. The Pathway to Loneliness: When Institutional Support Really Matters for STEM Graduate Students. Association for Institutional Research Annual Forum; UCLA. May 2011;
44. Quarterman J. An assessment of barriers and strategies for recruitment and retention of a diverse graduate student population. *College Student Journal*. 2008; 42(4):947–967.
45. Girves JE, Zepeda Y, Gwathmey JK. Mentoring in a post-affirmative action world. *Journal of Social Issues*. 2005; 61(3):449–479.
46. Thomas KM, Willis LA, Davis J. Mentoring minority graduate students: issues and strategies for institutions, faculty, and students. *Equal Opportunities International*. 2007; 26(3):178–192.
47. Carter DF. Key issues in the persistence of underrepresented minority students. *New Directions for Institutional Research*. 2006; 2006(130):33–46.
48. Willison S, Gibson E. Graduate School Learning Curves: McNair Scholars' Postbaccalaureate Transitions. *Equity & Excellence in Education*. 2011; 44(2):153–168.
49. Seymour, E.; Hewitt, NM. Talking about leaving: factors contributing to high attrition rates among science, mathematics & engineering undergraduate majors: final report to the Alfred P Sloan

- Foundation on an ethnographic inquiry at seven institutions. *Ethnography and Assessment Research*, Bureau of Sociological Research, University of Colorado; 1994.
50. Adams, HG. *Focusing on the Campus Milieu: A Guide for Enhancing the Graduate School Climate*. 1993.
  51. Gilliam JC, Kritsonis WA. National implications: The hidden nature of doctoral student attrition. 2006; 2006:1–7.
  52. Thomas AR. The organizational climate of schools. *International Review of Education*. 1976; 22(4):441–463.
  53. Halpin AW, Croft DB. The organizational climate of schools. *International Review of Education Internationale Zeitschrift fur Erziehungswissenschaft Revue Internationale de pedagogie*. 1963; 22(4):441–463. (from citation #52, page 445).
  54. Hurtado, S.; Milem, J.; Clayton-Pedersen, A.; Allen, W. ASHE-ERIC Higher Education Report. Vol. 26. ERIC Clearinghouse on Higher Education; One Dupont Circle, NW, Suite 630, Washington, DC 20036-1181; Tel: 800-773-3742; Fax: 202-452-1844; E-mail: order@eric-he.edu: 1999. *Enacting Diverse Learning Environments: Improving the Climate for Racial/Ethnic Diversity in Higher Education*. Web site: [www.eriche.org/Reports](http://www.eriche.org/Reports) (\$24.00)
  55. Foster SW, McMurray JE, Linzer M, Leavitt JW, Rosenberg M, Carnes M. Results of a gender-climate and work-environment survey at a midwestern academic health center. *Academic Medicine*. 2000; 75(6):653. [PubMed: 10875512]
  56. *Best Practices in Achieving Workforce Diversity*. U.S. DEPARTMENT OF COMMERCE AND VICE PRESIDENT AL GORE'S NATIONAL PARTNERSHIP FOR REINVENTING GOVERNMENT BENCHMARKING STUDY; Washing D.C: 2000.
  57. Mark S, Link H, Morahan PS, Pololi L, Reznik V, Tropez-Sims S. Innovative mentoring programs to promote gender equity in academic medicine. *Academic Medicine*. 2001; 76(1):39. [PubMed: 11154192]
  58. Kossek EE, Zonia SC. The effects of race and ethnicity on perceptions of human resource policies and climate regarding diversity. *Journal of Business and Technical Communication*. 1994; 8(3): 319–334.
  59. Mahoney MR, Wilson E, Odom KL, Flowers L, Adler SR. Minority faculty voices on diversity in academic medicine: Perspectives from one school. *Academic medicine: journal of the Association of American Medical Colleges*. 2008; 83(8):781. [PubMed: 18667896]
  60. Conrad P, Carr P, Knight S, Renfrew MR, Dunn MB, Pololi L. Hierarchy as a barrier to advancement for women in academic medicine. *Journal of Women's Health*. 2010; 19(4):799–805.
  61. Gibau GS, Foertsch J, Blum J, Brutkiewicz R, Queener S, Roman A, et al. *Diversifying Biomedical Training: A Synergistic Intervention*. *Journal of women and minorities in science and engineering*. 2010; 16(3):215. [PubMed: 21796238]
  62. Hicks-Clarke D, Iles P. Climate for diversity and its effects on career and organisational attitudes and perceptions. *Personnel Review*. 2000; 29(3):324–345.
  63. Mor Barak ME, Cherin DA, Berkman S. Organizational and personal dimensions in diversity climate. *The Journal of Applied Behavioral Science*. 1998; 34(1):82–104.
  64. Pugh SD, Dietz J, Brief AP, Wiley JW. Looking inside and out: The impact of employee and community demographic composition on organizational diversity climate. *Journal of Applied Psychology*. 2008; 93(6):1422. [PubMed: 19025258]
  65. Powe NR, Cooper LA. Diversifying the racial and ethnic composition of the physician workforce. *Annals of internal medicine*. 2004; 141(3):223. [PubMed: 15289221]
  66. Merchant JL, Omary MB. Underrepresentation of underrepresented minorities in academic medicine: The need to enhance the pipeline and the pipe. *Gastroenterology*. 2010; 138(1):19–26.e3. [PubMed: 19944787]
  67. Palepu A, Carr PL, Friedman RH, Ash AS, Moskowitz MA. Specialty choices, compensation, and career satisfaction of underrepresented minority faculty in academic medicine. *Academic Medicine*. 2000; 75(2):157. [PubMed: 10693848]
  68. Pololi L, Cooper LA, Carr P. Race, disadvantage and faculty experiences in academic medicine. *Journal of general internal medicine*. 2010:1–7.



69. Powell D, Scott JL, Rosenblatt M, Roth PB, Pololi L. Commentary: A call for culture change in academic medicine. *Academic Medicine*. 2010; 85(4):586. [PubMed: 20354371]
70. Price EG, Gozu A, Kern DE, Powe NR, Wand GS, Golden S, et al. The role of cultural diversity climate in recruitment, promotion, and retention of faculty in academic medicine. *Journal of general internal medicine*. 2005; 20(7):565–571. [PubMed: 16050848]
71. Price EG, Powe NR, Kern DE, Golden SH, Wand GS, Cooper LA. Improving the diversity climate in academic medicine: Faculty perceptions as a catalyst for institutional change. *Academic medicine: journal of the Association of American Medical Colleges*. 2009; 84(1):95. [PubMed: 19116484]
72. Whitla DK, Orfield G, Silen W, Teperow C, Howard C, Reede J. Educational benefits of diversity in medical school: a survey of students. *Academic Medicine*. 2003; 78(5):460. [PubMed: 12742780]

**Table 1**

## Themes from Focus Groups with MSSM Minority MD, MD/PhD, and PhD Students

Enrichment programs were considered valuable, but occasionally made some students feel they were perceived as not deserving acceptance to the graduate school.
Some students noted occasional negative student and faculty remarks e.g. 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 to providing additional support or guidance to students.
There was general consensus that research lab experiences were isolating.
On rare occasion, a negative incident was noted and was perceived to be based on a bias (race/ethnicity).