

Issues on diversity, training, and mentorship of young scientists: an interview

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ABSTRACT Academic institutions across the country have long recognized the value of racial integration and have consistently opposed legal challenges to affirmative action policies. Despite these efforts, the percentage of underrepresented minorities in academic positions has not increased in proportion to their representation in society. Recruitment of underrepresented minorities into scientific and academic careers is important, because these individuals provide valuable contributions to research and teaching, and they serve as positive role models to others aspiring to such professions. In this interview, Renato Aguilera, Chair of the ASCB Minorities Affairs Committee, answers questions from MBoC Features Editor Doug Kellogg about diversity in the scientific workforce.

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Why are minority training programs important for science and society?

Over the past 50 years, the composition of faculty and researchers at academic institutions has changed dramatically, with a large increase in the participation of people from diverse backgrounds, particularly women. Sadly, despite the best intentions of affirmative action programs, the percentage of underrepresented minorities in academic positions has not increased to a proportion remotely close to their representation in society. Not surprisingly, a 2007 survey of faculty at the top 100 departments in science, technology, engineering, and

mathematics (STEM) disciplines revealed that minorities were severely underrepresented (Nelson, 2007). Over the past decade, many national committees have been charged with providing recommendations to alleviate this problem, but no clear solutions have emerged.

Demographers predict that by the year 2050, the population of the United States will be composed primarily of minorities. It is therefore imperative from a workforce perspective that the United States train more biomedical professionals who will represent all minority groups. Seeing successful minorities in academic and high-level research positions has a profound positive effect on students aspiring to such professions. I remember meeting many such role models when I was a student and getting the sense that, if they could do it, so could I. Increasing the number of minority science role models in the immediate future should result in the same transformative effects seen in sports, music, politics, and other professions. Faculty across the country can help increase the participation of minority students in future years by opening their laboratory doors and increasing recruitment of minorities at all levels. Being inclusive is just the right thing to do.

Why are you involved in minority programs and minority student training?

One of the most rewarding activities that I perform as an academic researcher is training students in the laboratory and seeing them succeed. When I started college, I was barely surviving on financial aid and was desperate for a job. Fortunately for me, the first program that employed me when I was a sophomore in college was the National Institutes of Health (NIH) Minority Biomedical Research Support (MBRS) program. I ended up working in an immunology

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laboratory with the only Hispanic biology professor on campus, who turned out to be an excellent role model. Although I originally wanted to become a marine biologist, I fell in love with biomedical research, and that changed my life forever. It is for this reason that I like to expose students to hands-on research in my laboratory. Over the past 23 years, my group has trained well over 100 undergraduates, many of whom are now PhDs and MDs, and a few are now faculty members. I am also the current program director of the MBRS Research Initiative for Scientific Enhancement (RISE) undergraduate research training program at my institution. This program is basically a newer version of the program that supported me. After 9 years, more than 100 undergraduates have been nurtured by the RISE program on my campus, and approximately half the participants have enrolled in graduate programs. It gives me great satisfaction to see our trainees, most of whom are underrepresented minorities, graduate and move into prestigious programs at tier 1 institutions.

In addition, it has been well documented that student employment off-campus has detrimental effects on graduation rates, years to degree, and the all-important grade point average. Thus, training our students in our laboratories (and paying them for their efforts) greatly increases the likelihood of their successful completion of their degrees and also contributes to our research agendas—a perfect example of a win-win situation.

What advice do you have for young scientists?

I often hear from young scientists about their frustration and worries concerning the current research funding situation. I commiserate with them, as most of us get distressed at one time or another about the continued funding of our research. However, I remind them (and myself) that if they truly love what they do, they would do it on a shoestring budget and for little pay.

Several years ago, I participated in a grant-writing workshop sponsored by the Federation of American Societies for Experimental Biology (FASEB), and even though I had been relatively successful in securing funding, I learned new techniques that improved my grant-writing skills. New faculty and postdoctoral fellows should take advantage of these and other workshop opportunities, which address issues relevant to their survival in academia. Every year, for example, the Minority Affairs Committee (of which I am the chair) of the American Society for Cell Biology offers a junior faculty and postdoc career development workshop that covers subjects such as the tenure process, setting up a laboratory, grant- and paper-writing techniques, and several other pertinent topics (see www.ascb.org for details).

As in any other profession, it is important to network and become known in your special field. These connections may open doors many years later without you even realizing it. I know for a fact that networking has helped me at all stages of my career, from my first position as an assistant professor to my current position. I should also mention that networking is not solely pragmatic; it also helps create lasting friendships with others in academia. For example, some of the friends that I met when I was an undergraduate are now tenured faculty members. These friends will review your tenure packet, papers, and grants, provide moral support, and generally make the academic experience more rewarding and fun.

What advice do you have for mentors of young scientists?

Those of us who have been in the science business for a while know that mentoring has to be tailored to the individual. It is also important to be patient with your mentees and remember that different individuals respond differently to constructive criticism. Some may require a bit more hand-holding but the bottom line is that, as a mentor, you are there to encourage them to succeed and prevail

during difficult times. Some of the best mentors I have had were from other ethnicities and offered different perspectives that gave me insights I would have never discovered on my own. Also, remember that our mentees (like our children) sometimes will not follow advice the first time it is given. It may take a while for the advice to sink in, and on occasion you may need to remind them of that advice.

What are some key accomplishments in minority student training in the past decade?

During the past 10 years, more granting agencies have realized the importance of undergraduate research training and have become involved in the creation and implementation of a variety of minority training programs. One piece of the puzzle that was missing was the “rescue” of students via the implementation of postbaccalaureate training programs. The intention of these “postbac” programs is to keep students involved in research after graduation and prepare them to apply to graduate school. On many occasions, students with tremendous potential were lost to jobs unrelated to their majors, because they needed a break from academics (burned out) or they needed a job to pay their debts or to help their families. Many others forgot to prepare adequately for the Graduate Record Examination or did not take the exam at all, and thus were unable to apply to graduate schools. Due to the implementation of such programs, there are now many success stories of students who did not fall through the cracks and are now enrolled in prestigious graduate programs. In addition, there has been a large increase (>40%) during the past decade in participation of undergraduates (minority and nonminority) in conferences and societies that promote the participation of minorities in science, such as the Biomedical Research Symposium for Minority Students, the Emerging Researchers National Conference in STEM, the Society for the Advancement of Chicanos and Native Americans in Science, and several others. In addition to these conferences, societies such as ASCB, the American Society for Microbiology, FASEB, and many others provide travel awards to minority undergraduates, graduates, and faculty. The increase in student participation in these conferences bodes well for the increased efforts to attract underrepresented minorities into science careers. Apart from these gains, the scientific training community has vastly increased research into best practices in the mentoring and training processes. Symposia such as Understanding Interventions That Broaden Participation in Research Careers, as well as important scholarly papers on the subject, have increased our knowledge of interventions that work best to promote student retention and success in STEM fields.

What are the important future challenges?

Addressing health disparities is a national priority and, recognizing the importance of research in this area, the NIH recently formed a new National Institute on Minority Health and Health Disparities. Countless studies and reports indicate that minorities, and in particular African Americans, suffer disproportionately from a variety of diseases that range from HIV to cancer. Unfortunately, there are few minority researchers currently addressing the health issues that may affect them and their descendants.

Academic institutions across the country have long recognized the value of racial integration, as it improves intergroup relations and fosters positive attitudes between races. However, there is still an obvious need to recruit the underserved and disenfranchised citizens of this country into scientific and academic careers. Just as women have made strong inroads into the professoriate, so should minorities have the opportunity to prove themselves on a level playing field, but a great deal of leveling remains to be done.

In closing, I should mention that both of my daughters are pursuing biomedical research careers and that both intend to obtain a PhD. I am optimistic that they and future generations of American scientists will be able to pursue their scientific dreams in a welcoming and cordial environment that is conducive to the best possible research.

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