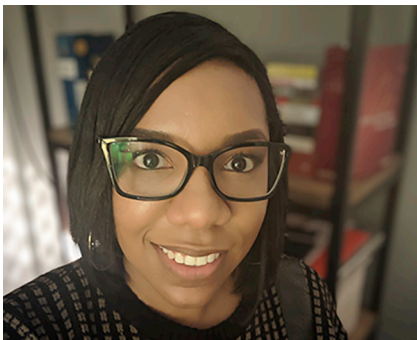


Voices

Voices on Diversity: Overcoming Barriers to Pursuing a Career in Science

As part of our commitment to amplifying the voices of underrepresented scientists, we are publishing the insights and experiences of a panel of underrepresented scientists in a series of questions and answers. Here, they tell us about barriers they faced in pursuing a scientific career. These are the personal opinions of the authors and may not reflect the views of their institutions.



Lakeya McGill

Postdoctoral Fellow, Johns Hopkins School of Medicine

A Lack of Representation

As a Black woman from the rural South and a first-generation college student with an invisible disability, I have experienced many barriers to pursuing a career in science. As a child, my parents instilled in me the importance of education and encouraged my passion for math and science; however, I had limited access to educational opportunities. For example, I never participated in a science fair or an academic program for students of color. Additionally, I knew few college-educated Black people and none with a doctoral degree.

During my undergraduate training, I attended a four-year, private, predominately white institution (PWI) that consisted primarily of upper-middle class, white students. Raised with quite humble roots, I experienced culture shock in the first semester, as I quickly learned that my peers had strikingly different experiences from mine during their primary and secondary education. For instance, many of my peers attended boarding, private, or magnet programs with abundant resources. This disparity contributed to me having imposter syndrome during my first year of college.

I was also a student-athlete, and others assumed and sometimes remarked that I was only admitted to the college due to my athletic abilities. These attitudes were discouraging and infuriating, given my history of a diligent work ethic and strong academic record. Contrary to their assumptions, I did not have a full-ride athletic scholarship, was admitted based on academic merit, and had to apply for numerous loans.

Throughout my education, including graduate school, another barrier to pursuing a career in science was the lack of visibility and mentorship from Black women. Indeed, I had my first Black woman educator during my last semester of college. This lack of representation deprived me of role models who shared my cultural background, life experiences, and worldview, which has been particularly challenging in education, where there is a white frame of reference. For example, I received clinical training in preparation to be a therapist during graduate school. In the limited multicultural education, the focus tended to be on the diversity of patients and rarely on clinicians or therapists of color who would experience racism and discrimination from patients.

As I advance in my career, I will likely be the only Black woman in my department and will continue to have few examples of how to navigate professional contexts. This lack of mentorship will likely contribute to significant work-related stress. For instance, I may experience unique barriers to supervising trainees, such as white men who have more power and privilege in society, and I would benefit from learning from other Black women who have had similar experiences.



Lathiena Manning Nervo
Assistant Professor, Pacific Lutheran University

Pushing Back against Stereotypes

There is a strong anti-Black sentiment in this country, which directly affects people within the scientific community. The scientific community does not exist in a bubble, and therefore people within it can express the same racist and sexist ideals. As a Black woman, I have had to consistently push back against stereotypes and anti-Black racism. As an undergraduate, I felt pretty welcomed in science. I went to an HBCU (historically Black college and university) for my bachelor's degree. Most of my professors were BIPOC and were incredibly encouraging. They promoted a sense of belonging and made sure we knew that we could make it in science. However, post bachelor's degree, I have had to defend my HBCU undergraduate education. It was challenged on my first day of graduate school and was suggested that maybe I take fewer classes my first semester because, "Individuals who come from HBCUs have a hard time adjusting to the rigor of graduate school." This immediately implies that my education was lacking just because of my background. Racial microaggressions are so numerous and abundant that I could spend pages listing them. It creates an unwelcome environment that continues to highlight my otherness. There is also a clash in culture. The scientific community is steeped in white supremacist culture, from the extreme focus on perfectionism to the insistence on objectivity. It makes it challenging to be successful. You're not only fighting the challenges of pursuing a doctorate degree but the onslaught of racial inequalities that are present through your time in graduate school.



Sabrice Guerrier
Associate Professor, Rollins College

Struggling with a Sense of Belonging

I would say that I faced two barriers in my pursuit of a career in science. The first is struggling with a sense of belonging. This has been a consistent barrier throughout my career. In conversations with colleagues from underrepresented groups, we often talk about imposter syndrome and this constant feeling that you will be discovered. Though these feelings have motivated me to work hard, it can be exhausting to constantly question oneself.

The second barrier was financial, which was particularly true during my undergraduate years. It would have been challenging to attend college had I not received an academic scholarship, and even then, I needed to support myself with outside employment for up to 40 hours a week. I was inspired by seeing my mother complete college while rearing and supporting a family with young children. If she could complete college with that headwind, then I felt that I could overcome whatever challenges I faced and complete college as well.



Amaliris Guerra
Postdoctoral Fellow, Children's Hospital of Philadelphia

Catching Up Academically

Obtaining a proper education was probably the first real barrier I encountered. The neighborhood school I attended did not have an adequate teaching curriculum, and therefore my math and science foundations were weak. Fortunately, one of my teachers, Barry Hertzberg, saw potential in me and invested in mentoring me. He nominated me for the Mayor's Award for Academic Excellence in middle school. After receiving the award, I gained acceptance to the prestigious magnet school Central High School in Philadelphia. However, the competitive academic environment was alien to me. I was forced to play catch up academically while also adjusting to living in shelters, group homes, and foster care and fighting racial discrimination at the high school. My situation improved once the bilingual Spanish counselor, Agnes Howkins, took interest in my short story writing abilities and provided me with much needed cultural guidance. Her support was instrumental in me finishing high school. Some of the same biases that hindered me in high school regarding my race, ethnicity, and gender were also problematic in graduate school. Unconscious biases affected my PI's overall confidence in my intelligence, which limited my ability to carry out projects and publish papers. Although I graduated with a PhD in biology, I'm still struggling with imposter syndrome as a result.



Josiane Joseph
MD-PhD candidate, Mayo Clinic Medical Scientist
Training Program

A Lack of Generational Wealth

Though I had early exposure to science, there was no access to biomedical professionals. At 12, when I decided to become a physician, the path was unknown (which caused me to doubt the feasibility of my aspirations). Furthermore, I was midway through undergraduate training when I learned about researchers. The lack of representation at all levels of my education made it challenging to identify mentors and assimilate into the research environment.

Another barrier to pursuing my career is racism. First, because regardless of how I perform, I am constantly asked to prove that I obtained my position by merit. The career is highly competitive without the extra burden of navigating the stereotypes. Nevertheless, I frequently field unfounded comments from peers that imply I am an exception to the rules on Black people or that my skin color promotes my success. Another impact of racism was evident throughout this pandemic. We have noted that minorities are over-represented in COVID-19 deaths, and as essential workers, they typically were forced to continue work or lost their jobs. These minorities include my family and friends. I have watched them panic about a deadly disease or consoled them as they shared how it changed their lives in other ways. I did all of this while maintaining my own essential responsibilities.

Finally, numerous academic decisions were influenced by my financial limitations. Whether I used tutoring services or test prep materials, how many programs I applied to, what books I could purchase, how I would pay for necessities—all of these are issues I regularly faced. Obtaining a job might appear to be the solution, but more than two years of unemployment elapsed while I searched for every job I held before age 22 (though I sent out dozens of applications). In stark contrast, I once had a colleague mention a \$10,000 loan from his parents that he used to offset closing costs when we were swapping stories about the challenges of purchasing a home. As a child of immigrants, there is no access to generational wealth. While my peers rely on familial support, I rely on money I save by avoiding vacations and any excess spending on activities of daily living. The financial decisions I must make take a toll on my well-being and overall detract from the training experience.



Jessica Silva-Fisher
Instructor of Medicine, Co-Director Mentorship
to Enhance Diversity in Academia (MEDA)
Program, Washington University School of
Medicine

Learning to Navigate the System

As the first to graduate from college, leave home, and pursue a career in the sciences, a barrier I faced was being able to navigate the system. I learned early on that I had to be courageous in speaking up and asking for help, which can be difficult for someone who didn't know anyone else who pursued a career in science. Being able to find the right people to ask about the correct courses to take, programs to participate in, and opportunities to take advantage so I could be on the path to becoming a scientist were difficult at times. I put a lot of effort into networking and finding mentors as a graduate student. These networks and mentors were essential in navigating the system and searching for postdoc positions and thinking about next steps following graduate school. To this day, I attribute my success to these networks and mentors who have helped me navigate the path to a faculty position.



Theodore Addo
Undergraduate student, University of Maryland,
Baltimore County

Attending the Strongest Schools

I have this one memory of attending science competitions in my early high school days, where I would take a chemistry exam along with my classmates and students from different schools in the state. I distinctly remember our school losing every year, but more so, I remember losing to the same school every year.

Growing up in Rhode Island, my family quickly learned that there were only a few schools in the state that provided students with a strong science background. Halfway through high school, my parents decided to transfer to a private school over an hour from where I lived where I was able to learn from the teachers who taught the students I used to compete with every year.

Science is often barred by financial ability and opportunity. My problem with this is that most underrepresented minorities do not have the financial ability to attend the strongest schools in their state, with the best teachers, and unless they are given this opportunity it will be difficult for them to achieve their dreams.



Marquis Walker
Assistant Professor, James Madison University

Finding an Environment to Grow

As an undergraduate, I did not find many barriers in pursuing science as a major. I attended a historically black college, and I was able to find mentors that not only supported me but had expectations for me to succeed. I came in with a desire to learn, and the tough-love style of some of my professors pushed me to do well. It was after I graduated and began job hunting that I faced some barriers. At the time, I was 23 years old with shoulder-length dreadlocks. I was going for a job interview at the community college, and one of my former bosses and references asked me if I was going to cut my dreadlocks for the interview. I was trained by my parents to go to an interview well groomed and professionally dressed. I realized that the comments of my former boss, who was also African American, was meant to get me to understand that my hair in dreadlocks would further accentuate my ethnicity. At that time in my life, I felt comfortable with myself and believed that if my hair or my ethnicity is a problem then I did not need to be there. I did get the job and I had the best and most supportive colleagues. I have used the same approach as I have pursued my science career. This does not mean that I did not have challenges or barriers, but I believe that this mindset has helped me focus my energy toward environments where I could grow. I recognize that my mentors along the way were essential in eliminating some of the barriers that I have seen others face.



Kamsi Odinnammadu
Graduate student, Johns Hopkins School of
Medicine

A Lack of Exposure

As a young person, my image of a scientist was the “mad scientist” trope always seen in television; I also did not know of any people pursuing a career in science (besides medical doctors/nurses). Because of these reasons, I didn’t really know what research meant until undergrad. I also had a tough time convincing my parents that my choice to pursue a PhD was a good one, due to my family’s lack of exposure to what research is and what careers I could pursue after getting my degree. I think this is a common issue with a ton of minority families; the lack of understanding about the field can be a major barrier to pursuing a career in science.