

Diversity Statement of Nathan T. Fried, PhD

“Diverse Perspectives Drive Scientific Breakthroughs.”

Perhaps truer in science than any other industry is that breakthroughs require researchers to approach problems from unique perspectives. Innovation is powered by creativity and creativity thrives when the voices of diverse perspectives are elevated ¹. Accordingly, diversity is essential for scientific progress. To foster it, it's crucial to be aware of the unique barriers for students of different backgrounds so that we can better prepare as faculty to help those struggling with challenges that we may have never experienced ourselves.

Personally, my challenge was financial; growing up low-income, it wasn't until I was in high school that my father completed his GED and my mother earned her bachelor's degree. As the youngest of three, my parents were determined to see me be their first to go to college. The lack of financial resources and social capital, however, caused me to struggle early on with challenges of not understanding how the college credit system worked, being academically unprepared, feeling immense imposter syndrome, and balancing part-time jobs to pay rent. In retrospect, I realize it was arguably luck that helped me find the mixture of mentorship and community necessary to envision a future in science that was previously so foreign to me. These early experiences have driven me to immerse myself in the literature regarding first-generation and/or low-income (FGLI) students in STEM to find ways of helping them succeed that are more reliable than just luck.

This concept was the inception of a study I'm collaboratively conducting that examines how nostalgia can improve science identity in underrepresented students. Science identity is a measure of how much a student *feels* like a scientist which positively correlates with retention and success, especially for underrepresented students ². Nostalgia exercises where the student reflects on reasons why they came to college are effective at increasing FGLI student belonging and college retention ³. Thus, I created a “science nostalgia exercise” where FGLI students reflect on a moment in their life that sparked their interest in biology to examine if it can increase science identity, and in turn student success. My hope is to find institutional ways to help FGLI and other underrepresented students deal with the emotional and practical challenges they face in college.

I'm also trying other interventions to help students overcome these barriers. In the classroom, I'm very open about my low-income background and personal challenges. For many students, this may be the first time they've heard someone verbalize these challenges so openly and I do it to break down the barriers that often prevent underrepresented students from reaching out to faculty when they're in need. I also start all my classes with very basic instruction on “How to College” where I discuss office hours, how to write an email to a professor, or the importance of cultivating their careers with research. Similarly, these small parts of my lectures may be the first time they've heard this practical advice.

Many of these underlying struggles that FGLI students face are also shared by students of color, people with disabilities, women, and those in the LGBTQ+ community. Further, the intersectionality of these dual identities may present even more complex challenges ⁴. Implicit biases and various institutional barriers at every career stage can create a culture where those from these backgrounds find it harder to thrive ⁵. Often, these barriers do not necessarily lead to a decrease in enrollment, but instead a decrease in retention. Thus, I always approach STEM with an eye on developing curriculum and techniques within the classroom and across the campus that foster an inclusive environment so that once a student has started, they will be emboldened to continue their pursuits of a scientific career.

This is reflected throughout my academic career where during my postdoc, I received a unique NIH K-award as an IRACDA fellow in which I trained as a researcher and educator to use best practices for promoting diversity in biology. As part of this program, I studied active learning techniques that improve retention, enrollment, and academic achievement for underrepresented students ⁶. I continued these efforts as a faculty member where I co-wrote a [successfully funded](#) NIH undergraduate MARC U-STAR research training program under the leadership of Dr. Kwangwon Lee who serves as it's PI/Director. As it's Assistant Director, I'm responsible for mentoring undergraduates from underrepresented backgrounds to become competitive for PhD programs. As the Assistant Director for Undergraduate Research & Education, I'm also integrating authentic research experiences into the curriculum with traditional and modified CURE strategies so that students can learn essential discipline-specific skills without the need for volunteering time, something FGLI students disproportionately can't do since they often work off-campus jobs.

Struggling with the challenges of being from a low-income background has fortified my passion for making science inclusive and has helped me develop an empathetic view for diverse barriers. My postdoctoral training as an IRACDA fellow and my experience developing the MARC U-STAR program as a professor has helped me refine the tools necessary to make a positive impact on diversity in the biomedical sciences. Combined, I'm uniquely positioned to continue leadership roles in research and education that foster the diverse perspectives necessary to make important scientific breakthroughs.

References

1. Hong, L. & Page, S. E. Groups of diverse problem solvers can outperform groups of high-ability problem solvers. *Proc. Natl. Acad. Sci. U. S. A.* **101**, 16385–16389 (2004).
2. Stets, J. E., Brenner, P. S., Burke, P. J. & Serpe, R. T. The science identity and entering a science occupation. *Soc. Sci. Res.* **64**, 1–14 (2017).
3. Abeyta, A. A., Routledge, C. & Juhl, J. Looking back to move forward: Nostalgia as a psychological resource for promoting relationship goals and overcoming relationship challenges. *J. Pers. Soc. Psychol.* **109**, 1029–1044 (2015).
4. Jackson, J. F. L., Lang, N. M. & Adserias, R. P. Intersectionality and STEM-The Role of Race and Gender in the Academic Pursuits of African American Women in STEM.
5. Asplund, M. & Welle, C. G. Advancing Science: How Bias Holds Us Back. *Neuron* **99**, 635–639 (2018).
6. Olson, S. & Riordan, D. G. *Engage to Excel: Producing One Million Additional College Graduates with Degrees in Science, Technology, Engineering, and Mathematics. Report to the President.* (Executive Office of the President, 2012).