

I remember my astonishment when I first realized that, rather than passively observing science, I could actually make contributions of my own. My shift in thinking was catalyzed by “nerd school,” the North Carolina School of Science and Mathematics (NCSSM), a public, residential high school. NCSSM gathered juniors and seniors from every county in the state to attend college-level classes in a supportive environment. Its mix of precocious classmates and passionate teachers fueled my desire to become involved in education, and I applied to become a physics teaching assistant in my senior year. Because I had already taken a more advanced physics course, I thought that teaching the introductory level of high school physics would be simple. But botching a simple explanation of acceleration on my first day demonstrated how good teaching requires equally good preparation, and I prepared extensively for future tutorials. Intimidated by the fact that my students were also my peers, I continued to work hard to earn their respect as a teacher.

My responsibilities included leading labs, grading, and holding weekly tutorial sessions, all of which made for a busy senior year. My class and I weathered many trials together, the most unexpected being the early labor of our professor’s wife. He took paternity leave, leaving me to teach two lectures alone with only a frantic call and his messy notes for guidance. During those classes, I almost was too nervous to notice that I relished finding new ways to explain difficult concepts, using NERF balls to visualize acceleration, or my students themselves to represent fluid energetics. My efforts were entirely validated when, during our last tutorial, my students presented me with a bundle of balloons and an award for “Unofficial Best T.A. Ever.”

NCSSM exposed me to subjects as diverse as astrophysics and neurological psychology – I graduated high school with a fantastic education and a thirst for more. How could I ever satiate my curiosity? I enrolled at UNC–Chapel Hill eager to explore my boundaries. Following the impulses of my curiosity led me to choreograph for a dance company, work in a bookstore, write a poetry honors thesis, and take soupcons of philosophy, classics, and linguistics. But I was most captivated by my biology courses, and it was only natural that I joined the lab of Shawn Ahmed, a biology professor, at the end of my sophomore year.

As an introduction to research, telomere biology was both approachable and engaging. It addressed a question I could wrap my mind around – How does a cell become immortal? – with extensions to more complex systems involving germline immortality, like aging and carcinogenesis (discussed in my previous research essay). I developed protocols for a telomere overhang assay, immunostaining, and fluorescence *in situ* hybridization. This gave me an excellent training in scientific thinking as well as an introduction to the scientific community. Encouraged to attend departmental talks and poster sessions, I saw how open communication was crucial to research, especially when post-docs and graduate students began to ask for my help with incorporating my methods into their projects. My senior year, I applied for and received a research fellowship for a project of my own design. Writing the proposal exposed me to the jargon-filled world of scientific literature, but it also led to a revelation: the vast difference between research and stagnant textbook-biology. I noticed a rift that I could help bridge, an opportunity to make a difference beyond my contributions to research.

Though research became my main focus in college, I was determined to stay involved on campus and avoid the trap of the ivory tower. My freshman year, I joined Circle K, an international service organization that volunteers with homeless shelters, retirement homes, UNICEF, and other nonprofits. My senior year, ready to assume a more influential role, I ran for club president. When I was first elected, a maelstrom of duties nearly overwhelmed me, and I quickly learned the value of judicious delegation and meticulous organization – skills that have continued to help me in the

seemingly unrelated area of being a successful researcher. Moreover, I realized the merit of immersing oneself in a community: my work with Circle K and its hundred members allowed me to make a positive impact beyond campus. My dedication and my club's enthusiasm were recognized with the 2007 award for Best Club in our district.

My last project as president was to initiate a collaboration with the YMCA's Boomerang initiative, a program for suspended high-schoolers. As "real life" college students, I felt that members of Circle K were uniquely situated to act as role models to these mostly minority students. With a proposal that combined gardening and science lessons, I received two different service fellowships for our collaboration. Though I expected this project to be rewarding, I was caught unawares by our students' enthusiasm. We thought we'd be working with troublemakers who simply didn't want to learn. On our first day, we expected to find apathy – instead, we found encountered high spirits and tons of questions. Using the garden, we were able to teach science in a way that was immediately relevant to these students, with lessons on topics like pH, phylogeny, and crop rotation. My favorite story is of Jamal, a student who, impressed by the idea of "valuable garbage," instituted a compost program in the YMCA cafeteria. This made it clear to me that science could be meaningful to everyone, if I could only find the best way to present it.

Working as a mentor enhanced my desire to interact with a diverse range of undergraduates through teaching. I chose to attend Berkeley precisely because of its cutting-edge research and university setting. As a graduate student instructor for more than sixty students in my department's upper-division genetics course, I find myself in an entirely different teaching situation, with the luxuries of choosing my own material and students able to grasp complicated situations. This allows me to teach in a way that approximates the scientific process, by having my students debate the merits of two opposing models. I care deeply about the craft of science, and hope, through my enthusiasm and curiosity, to motivate my students to find their own paths toward research.

Despite the rigors of graduate school, I'm continuing my personal goal of community outreach. Though some see teaching as only an impediment to research, my PI, Barbara Meyer, fully supports my efforts in teaching and volunteering. My peers have also recognized my dedication by electing me as one of five student representatives for the MCB department; my responsibilities include faculty searches and conveying grad student concerns. I've become involved with SACNAS, a group that encourages minority undergraduate participation in research. Off-campus, I helped a fellow grad student start a weekend tutoring program for Oakland and Berkeley public school students. It's striking how strongly my teaching here contrasts with my teaching at the university. Rather than emphasizing the ambiguity behind known facts, I must focus on simple concepts using multiple explanations. I've seen the value of combining both teaching styles in a way that brings science to life.

As a scientist and a student, I've experienced the virtues of fusing strong research with equally strong communication. Long acronyms and obscure terms have become the norm in scientific discourse. Non-specialists are simply unable to understand primary data, and many make far-reaching decisions – political, ethical, and personal – based on incomplete information. Though scientists are the impetus of research, we also act as curators of public knowledge. It is imperative that we communicate the significance of our work. I have tried to make science accessible to others, and hope to continue my efforts by becoming a professor at a research university. This NSF Fellowship would allow me to conduct earnest research while learning new ways to contribute to and discuss biology. But for me, talking about science is more than just a duty: I want to share my wonder at the power of scientific research. Besides, science is best when shared.