

I have always had a thirst for knowledge, an unquenchable curiosity about the natural world. As a child, I regularly observed the behavior of animals in the zoo or nearby parks and read books on biology and geology. I originally dreamed of becoming a zookeeper, but the realization that people could study the animals instead of just taking care of them quickly prompted a shift in focus to becoming a field biologist.

Upon entering middle school, my parents convinced me that field biology was a hobby, not a proper career. With the encouragement of Mrs. Lane, the teacher who was the first to nurture my developing interest in science, I participated in Science Olympiad, a competition that continued to broaden my knowledge of Nature. I explored numerous topics in depth—insects, birds, human physiology, geology—and this reinforced my desire to pursue a career in science. I just did not know what field of science I wanted to study, though I had a growing interest in genetics and chemistry.

Another goal arose when my eighth grade English teacher organized a trip to a convalescent home on Make a Difference Day. My first volunteer experience made a huge impact on me. The grins on the faces of the senior citizens showed me that nothing is more gratifying than improving someone else's life, whether it be as simple as a smile or as complicated as building a house. I knew then that I wanted a career that could help other people, and I decided to become a doctor.

Though I was set on pursuing a career in medicine, I remained interested in basic research. Dissatisfied with merely learning about what others discovered, I wanted to run my own experiments and answer my own questions. I explored chemistry research in high school and college; the variety of research projects I completed helped form my ability to think critically about all types of experiments and scientific questions. The realization that I enjoyed conducting research led to the belief that getting an MD/PhD was the best way to accomplish my goals—I could then conduct medical research (I wanted to develop a vaccine for HIV) and see patients in a specialized clinic.

I was well on my way to becoming a medical researcher until I happened to see the ornithology textbook by Gill in the Harvard bookstore. In high school, I had used Gill's *Ornithology* to prepare for the ornithology event in Science Olympiad, so the book brought back many fond memories. Eager to refresh my knowledge of bird identification and life history, I enrolled in the ornithology class for fun. Little did I know that this class would reawaken my childhood dream to become a field biologist. I had my first exposure to fieldwork (we mist-netted birds in Costa Rica) and met students aspiring to be ornithologists and ecologists. More importantly, I got to know the professor, Scott Edwards, who has the job I wanted when I was ten years old! Here was living proof that one could in fact have a career in evolutionary biology. I soon joined the Edwards lab and am currently working on my senior thesis. My goal is to characterize the genetic mechanisms underlying the evolution of disease resistance in house finches following an epizootic caused by *Mycoplasma gallisepticum* in 1994. It is a superb opportunity for me to apply the ideas and lab techniques I learned in my molecular and cell biology classes to a question that fascinates me.

My current research interests are somewhat varied; broadly, I am interested in the genetic basis of adaptive behavior, or the molecular mechanisms underlying behavior. How do birds respond to environmental changes or to intra- and inter-specific interactions? What genes are responsible for that response, and how can the evolution of certain phenotypes be explained by genetic mutations and/or gene regulation? Some more specific areas of interest include host-parasite interactions, cooperative breeding, disease genetics, and sexual selection. I still have a

special interest in disease and immunology, though my focus has shifted from HIV vaccine development to emerging wildlife diseases, which may have the potential to spread to humans. I would like to study how immune systems evolve in response to disease and whether immune function plays a role in other behavior. For instance, I wonder if MHC plays a role in mate choice in birds as choosing MHC-dissimilar mates may result in offspring with more effective immune function. If so, does the mechanism of MHC discrimination in birds involve olfaction as it does in many other vertebrates? I want to combine fieldwork with molecular studies to find genetic or biochemical explanations for observed behavior.

Although I devote much of my time to science, it is not my sole enjoyment in life. I also love interacting with others and teaching. I spend much of my time teaching differential equations and multivariable calculus classes as a math course assistant (CA) or volunteering. Working as a CA these past three years has been a rewarding experience. I enjoy getting to know my students, planning sections and figuring out different ways to explain various concepts. Last year I was awarded a certificate of distinction from the Harvard University Derek Bok Center for Teaching & Learning for my teaching. Most of my community service activities also involve education: I advise leadership camps and teach First Aid/CPR classes for the Red Cross while serving as a member of the Community Health Initiative, a student group that acts as a liaison between the student body and the university health services through advocacy and programming.

I also do a lot of disease education with Project HEALTH, an organization that works to break the link between poverty and poor health by mobilizing undergraduates and forming partnerships with hospitals, lawyers and various community organizations. I started in the program called STRIVE, a sickle cell teen mentoring program. As a STRIVE program coordinator last year, I not only improved the program but also pushed through a number of advocacy projects. We raised public awareness of sickle cell disease by giving presentations at local schools, talked to school principals to get our mentees the resources they need, and began a needs assessment to demonstrate the disparity between the needs of our mentees and the resources provided by Boston public schools. As a campus coordinator, I now oversee all seven Project HEALTH programs in Boston. I work with the different program coordinators to expand their programs, foster inter-program collaboration, develop relationships with other community organizations, and much more. Through my work, I have developed essential leadership and organizational skills. I strongly believe in sharing resources and uniting different organizations under a shared goal. Furthermore, from my interactions with chronically ill children and their doctors, I have come to value the mentor-mentee relationship: while physicians are capable of treating medical symptoms, a mentor can affect the social and behavioral components of health that cannot be fully addressed in occasional clinical appointments. A mentor can affect many aspects of one's life, from boosting self-esteem to altering habits and goals—and this is the type of difference I would like to make in the lives of others.

With a lifelong interest in science, particularly the life sciences, I want to continue my scientific pursuits in the future. Furthermore, with a love of teaching that rivals my devotion to science, I hope to apply my knowledge to help others, a goal that I feel can be best accomplished by pursuing a career in academia. As a professor, I will be able to continue my quest for knowledge while sharing my experiences with students. I want to become a good scientist, teacher and mentor. I am currently applying to graduate programs in ecology and evolutionary biology, and the NSF fellowship would give me the freedom to choose a program and concentrate on my research without financial constraints. The path will be difficult, but I believe my determination and work ethic will enable me to succeed.