

My curiosity for scientific research began in my sophomore organic chemistry lab, at the University of Toledo, when I was asked to be a part of the NSF-funded Ohio Research Experience to Enhance Learning (REEL) project, a program designed to teach concepts and techniques in organic synthesis. Using the skills I refined while in this program, I joined an organic chemistry research group where I synthesized, purified, and characterized a class of potentially novel antibiotics. In my next year at UT, I started a second project that became the work for my undergraduate honors thesis. I studied the potential physical and functional changes in red blood cells as they age, or senesce, by characterizing and sequencing mammalian hemoglobin using a suite of analytical instrumentation. In my senior year, I joined a soil ecology lab where I gained experience in how analytical chemistry may be used in environmental research, and co-authored a peer-reviewed paper on soil amino acids that was published in *Soil Biology and Biochemistry*. From undergraduate research to publishing my first paper, *my desire to combine my interests in environmental field research and chemistry is the reason why I am driven to pursue a doctoral degree in analytical chemistry*.

Undergraduate research taught me how to design an experiment that tests a clear hypothesis, and how to communicate my results to my colleagues and the broader scientific community both in written and verbal form. During both the REEL project and my thesis work, I encountered obstacles in method development and execution. In overcoming these obstacles, these projects introduced me to the fundamentals of research design and the importance of persistence and dedication in scientific research. I presented my findings from both projects at multiple professional meetings and seminars, including my oral thesis defense to the Honors College at UT, and at the American Chemical Society (ACS) spring meeting and exposition in 2011. Interacting with fellow researchers at these meetings reinforced my enthusiasm to work with other scholars who are also interested in working at the forefront of science.

To strengthen my research experience in environmental issues, I joined the environmental sciences department at UT. As lab technician, I manage multiple projects with various logistical concerns and large data sets. It is essential that I think critically and creatively, and be informed on the current literature associated with each of our projects. During the summers, I collect data at the Toolik Lake Long-Term Ecological Research (LTER) Field Station on the northern slope of the Alaskan Brooks Range. Our goal is to gain insight into how terrestrial ecosystems respond to disturbances, such as warming or changing seasonality, due to global climate change. Fieldwork introduced me to the complexity and unpredictability of the natural environment. In the field, I was exposed to all levels of academics in a variety of disciplines. I benefitted from engaging in scientific discussion and exploration, and quickly became determined to blend my interests in chemistry and the environment into my own original research.

During this time, I also had the opportunity to participate intellectually on many projects in the lab. I used my previous knowledge and experience in analytical chemistry to make a unique contribution to the development of a fluorometric method, for the quantitative determination of amino acids in soil, needed on the Arctic project. This work led me to the publication of my first scientific paper. In adapting a previous method, I applied my analytical abilities in the lab, and my familiarity with the chemistry of fluorescence, to generate optimal microplate conditions in order to obtain sensitive and accurate results for our assay. The process of working on a manuscript provided invaluable experience in scientific writing and data analysis, and taught me what is necessary to take a scientific project from idea generation to the final published product.

*Scientific Leadership:* As an undergraduate and post-graduate at UT, I have been closely involved with several scientific organizations, including the ACS, Alpha Chi Sigma Professional Chemistry Fraternity (AXΣ), Women in STEM Excelling (WISE), and the Association for Women in Science (AWIS). My work with these organizations has allowed me to broaden my impact on the local community with numerous outreach events. For example, I worked with a team of undergraduates to construct the only pre-professional STEM Summer Camp for high school students in the area. I have also helped Girl Scouts and Boy Scouts of America obtain a chemistry merit badge by creating specific programs and laboratory experiments for them on campus. I have peer-led chemistry classes as a complementary course to our general chemistry series at UT, and I also tutor chemistry to inner-city and homeschooled students, and high school teachers with hands-on scientific demonstrations. These positive experiences remind me how important it is to make time for communicating what we learn as scientists to the public.

The diversity of my undergraduate career was integral to my ability to overcome adversity and move past barriers. In addition to my honors classes, research, and extracurricular organizations, I was offered the opportunity to captain Toledo's Varsity Volleyball offense as setter on a Division I NCAA athletic scholarship. Through athletics, I learned how to balance a demanding course load with the physical and mental stresses of being a collegiate athlete. As a freshman, and the only scientist among a group of athletes, I was expected to lead our team on and off the court. I also enrolled in two minors that interested me: Forensic Investigation and Spanish. As a student in the Criminal Justice College, I gained valuable insight into what it will be like to be a woman pursuing a degree in a profession dominated by men. The honors curriculum and these additional fields of study allowed me to explore politics and literature, and further develop my versatility in research and communication.

Having personally experienced the importance of science in many fields of study, from the hemoglobin in our blood to the polar ice caps of our planet, I will continue to share that knowledge with younger students and fellow academics in programs such as the Barrow Arctic Science Consortium (BASC), PolarTREC and the REU program throughout my graduate studies. It is also a priority of mine to increase the representation of minority groups in chemistry. I will use my knowledge of the Spanish language to help teach the importance of science to students who speak English as a second language. My fundamental objective in outreach and education is to get people as excited as I am about answering scientific questions.

*Career Goals:* With the help of my mentor, Dr. Nina McClelland (Dean Emeritus of the College of Arts and Science (UT) and Former Chair of the Board, ACS), and my ambition to succeed in analytical chemistry, I have focused my research interests on Arctic atmospheric chemistry. Following the work of several potential advisers participating in research similar to that of Dr. Paul Shepson (Purdue), Dr. Detlev Helmig (UC-Boulder), and Dr. Ronald Cohen (UC-Berkeley), I am excited about the wealth of opportunities in the atmospheric chemistry community. Whether I pursue a leadership position in the governmental or industrial sector, or a career in academia, I will retain my ties to public outreach with organizations such as the NSF and ACS.

The perspective I gained from refining my research interests via fieldwork and continuing my education beyond the classroom, in conjunction with my strong academic history and leadership skills, have prepared me well for a career in science. *In short, chemistry is what interests me, and I will do everything within my ability to promote its most important discoveries, represent the NSF fellowship program with distinction, and make a substantial contribution to science.*