

To me, the most exciting part of science is the creation and communication of knowledge. This transfer of knowledge is a fundamental aspect of successful research: science is not just facts, but sharing advice, results, ideas, and problems. This does not only apply to the scientific community, but to all fields of knowledge. My experiences both in the lab and out demonstrate how important I believe it is to communicate, collaborate, and connect everyone. I want to use my voice to bring passionate people together to

Intellectual Merit: Personal and Educational Experiences

I completed my Bachelor of Arts degree in biological sciences at [REDACTED] with a minor in chemistry and an emphasis in pre-health. Entering college, I dreamed of becoming a physician; however, I quickly fell in love with research. I have always been drawn towards kinesthetic learning and I was able to get this in part through my laboratory classes. While these classes drove me to consider a career in scientific research, I knew that obtaining laboratory experience was the first step in determining if this was the career for me. The summer after my sophomore year, I worked in the laboratory of [REDACTED] at [REDACTED] studying pulmonary hypertension. Here, I was able to plan experiments of my own and interpret the results. My excitement for this independence motivated me to find a research opportunity back at MHC where I subsequently worked with a visiting professor, [REDACTED], to study the effects of calcium ion flow on the growth rate of the moss *Physcomitrella patens*.

Inspired by these initial research experiences, I sought to broaden my training further and spent the next summer at the [REDACTED] in [REDACTED] working with [REDACTED] on the mechanisms of centrosome maturation. **I was granted a [REDACTED] Award [REDACTED] to work fulltime in understanding how Aurora A regulates Polo-like Kinase 1 (Plk1) at the centrosome using cell cycle techniques, immunofluorescence, and microscopy. I quickly learned how to plan, execute and analyze experiments using these techniques, without any prior experience, which confirmed to me my aptitude for scientific research. I showed that Aurora A facilitates initial activation of Plk1 at the centrosome in G2, however, inhibition of Aurora A does not significantly delay cell cycle progression. These findings laid important ground work for further research done in the lab, including my own. I presented a poster at the annual [REDACTED] summer poster day and had the opportunity to speak at the [REDACTED] Symposium at [REDACTED] about this experience. This symposium is designed to educate younger students at [REDACTED] about possible summer experiences and advise them on how to seek similar opportunities.**

During my senior year, I sought out the opportunity to join the lab of a newly hired assistant professor, [REDACTED], to work on a senior project. Here, I investigated the regulatory role of a RNA hairpin in bacterial development. I mastered cloning techniques and implemented a gene expression assay, two techniques which I had not used before. Most importantly, I formulated a research question, hypothesis, designed experiments, and performed analysis for my project. This culminated in a **comprehensive senior project report as well as an oral presentation at the annual Senior Symposium at [REDACTED]**

While obtaining my Ph.D. was a clear goal for me, I wanted to gain more lab experience, so I reached out to [REDACTED] for a postbaccalaureate position. I was attracted to the postbac program at [REDACTED] because it emphasizes development in all areas critical to becoming a successful scientist, not just technical skills. Based on my previous summer of motivated, critical, hard work, I was **awarded a [REDACTED] to work full-time as a postbac in [REDACTED] lab. I developed as a scientist in many ways throughout those two years; formulating research questions, planning experiments, presenting, learning various**

techniques, and collaboration. My work was published in the Journal of [REDACTED], and I am second author on this manuscript [REDACTED]. Highlights of those two years include a poster presentation at an international centrosome meeting in [REDACTED], an institute-wide research symposium at the [REDACTED] where I won an award for an outstanding poster, and an opportunity to speak in a postdoctoral seminar series, although I was only a postbaccalaureate fellow. Outside of my main project, I also lead a collaboration to identify possible targets affecting centrosome maturation through a high throughput siRNA screen and I established protocols for using zebrafish as a model organism in our lab.

Currently, I am pursuing my Ph.D. in [REDACTED] Biology at [REDACTED]. I chose this program because the resources and support available to me over the course of my education will provide me with an incomparable environment to continue my scientific development. I have joined the lab of [REDACTED] to study the biophysical principles of microtubule dynamics. I was drawn to this lab based on the interdisciplinary approach to answering fundamental questions regarding microtubule dynamics. I am interested in elucidating essential mechanisms of cell biology and the [REDACTED] lab provides me with the resources and mentorship I need to do that and develop as a young scientist to continue to do so in the future. I have been awarded a competitive spot on [REDACTED] Training Grant to support my first year in the lab. Since joining [REDACTED] group I have single-handedly set up mammalian cell culture and acquired promising preliminary data to drive my thesis project testing the role of GTP hydrolysis in regulation of microtubule dynamics.

Broader Impacts: Outreach, Leadership and Mentoring

While at [REDACTED] I had the opportunity to be a cell biology mentor in a popular, successful program called [REDACTED]. [REDACTED] emphasizes active learning, giving the students a place to learn the material outside of a lecture and textbook through collaboration and mentoring. As a student I attended [REDACTED] sessions for all of my classes, as I found them extremely useful because they allowed a place for me to truly understand the concepts. I was honored to be selected as a [REDACTED] mentor for cell biology in my senior year. I felt the program had benefited me so much as a student and I was happy to return the favor to younger students. As a mentor I lead workshops for students where I planned a number of activities and worksheets related to that week's topics. In addition, I acted as a liaison between the professors and students to create effective workshops.

In addition to this experience, I was strongly impacted through my sports leadership activities. Throughout my four years at [REDACTED] I was a member of the soccer team and I was captain of the team for two of those years. This commitment should not be taken lightly. **The lessons and experience I gained from being a member and leader of a team are unparalleled: as a captain I was seen as a leader both on and off the field, regarding everything from soccer to academics.** I was responsible for organizing events as small as team dinners and as large as international outreach initiatives. Being a part of the team was not just about playing soccer; it meant having a role in teaching younger girls about the importance of an education, collaboration, leadership, compassion and sportsmanship. Over these four years I participated in many outreach activities, but most memorable was the global outreach. Instead of taking winter break one year, our team headed to [REDACTED] to take part in a [REDACTED] [REDACTED] r to educate women about the athletic opportunities women have in the United States and how they can be implemented in other countries. Collaborating with women from different [REDACTED] universities as well as notable female [REDACTED] athletes to emphasize the importance of athletics was a once-in-a-lifetime opportunity. Our relationship continued as we

welcomed [REDACTED] players from the **Bridge Program** to [REDACTED] annually. The Bridge Program was designed to expose [REDACTED] women to the athletic facilities and support that is available to female athletes in the United States, in hopes that they can build programs up to offer female athletes in [REDACTED] top tier support and facilities. The second global outreach our team was involved in was **bringing a group of female soccer players and coaches from [REDACTED] to the United States** where they spent three weeks exploring the country and learning about our athletic system. We lead workshops and training sessions for the players to teach them the fundamentals and importance of education, communication and athletics, and how they are intertwined. The work was funded through the [REDACTED] of the United States Department of State and emphasized the importance of sharing knowledge. Both of these global outreach experiences share one common goal: to educate women about the opportunities that we have in the United States and how to implement them in their countries. These experiences have driven me to appreciate the importance of education and knowledge transfer and I plan to bring this impactful lesson to my scientific pursuits.

I wanted to continue my involvement in science education during graduate school. Since coming to [REDACTED] I volunteered to mentor incoming students, giving them advice on how to adjust to the first year of graduate school. In addition, I am currently involved in two outreach initiatives on campus; the [REDACTED], an outreach organization that brings [REDACTED] students into local middle schools to provide science education and a **multi-lab science-day** to bring elementary school children into the lab and educate them about basic scientific processes. It is important to educate and get the younger generations excited about science because they are the future of research. I have already discussed mentoring undergraduate students in the lab with [REDACTED] and look forward to this opportunity.

Educational, Career Development and Future Goals

I am proud of all that I have accomplished; however, my successes did not come easily. During my first semester in graduate school I was diagnosed with dyslexia, a reading disorder. Learning about this was one of the few things that ever immediately made sense to me. While I loved my education, it was always a challenge for me. I was told that this was because I was not motivated enough or did not try hard enough. Despite this, I never stopped preserving, knowing I wanted to be successful, despite my mediocre grades and test scores. It never crossed my mind that the reason I was never able to excel academically was due to neurological challenges. Looking back, I acknowledge that my experiences were never given to me based on my academic record; I was always told that the best part of my application is my recommendations and interview. **This is proof that I fight through challenges:** I am a motivated person who has a strong passion for science, and I communicate this well with the people around me.

All of my experiences have led me to my path looking forward: my passion is to be a mentor and advocate for those who need a voice. **I want to give back;** I have benefited from times when people have stuck their neck out for me and gave me a chance and I want to do the same for students who may struggle a little more in the classroom but are still intelligent and have a lot to offer. Just as women in other countries lack opportunity to play soccer or have leadership roles in male-dominated professions, there are bright and talented students who are not taken seriously due to pre-conceived ideas about their ability to succeed in the classroom. Sometimes, all an individual requires is an opportunity and someone who believes in them to initiate their career; I want to be that someone and make an impact in science and education. Attaining the NSF GRFP would allow for me to continue the maturation needed as a scientist to accomplish these goals.