Like most students who earn good grades in math and science classes, I found myself "destined" for the medical field upon graduating from high school. I was bombarded with ideas of what my future should hold, and all of them ended with me in a white coat making rounds at a hospital. So, I gathered up all of my courage and transitioned from a high school of only 200 students to Clemson, a public university of over 20,000. I will never forget the feeling of walking into my very first Biology lecture and seeing a crowd of more than 300 students. I nervously found a seat and awaited the caricatured, stodgy biology professor to descend upon us lowly freshmen. What I got was the exact opposite. Dr. Espinoza was a passionate and caring teacher, and two semesters of her class made me fall in love with Biology. Her animated lectures on cellular pathways, population ecology, and everything in between made me realize that my predilection for math and science didn't necessarily mean I was destined for the medical field; it meant I was headed for a career in biological research.

Thanks to Dr. Espinoza and many other professors like her, I found that scientists aren't just mythical creatures you hear about on the National Geographic channel. They are real people who answer real questions and solve real problems. This realization came as a bit of a surprise to a girl from a small, rural town in South Carolina. "Scientist" wasn't exactly on the list of careers presented to me by my high school guidance counselor, and I had no clue what it meant to conduct scientific research. So, when my advisor encouraged me to get involved with a research team on campus, I didn't really know what I was getting into. Heeding his advice, I timidly approached Dr. Rick Blob, my vertebrate biology professor, at the end of lecture to ask if he had any openings for undergraduates in his lab. That was the beginning of one of the most formative experiences of my college career.

Research Experience: I began working in Dr. Blob's lab the second semester of my sophomore year. I didn't really know what his research entailed at the time, but I was excited to learn and experience first-hand what it was like to work in a lab. Each undergraduate student was paired with a graduate student, and I ended up with Christopher Mayerl, a PhD student in the Blob lab. His research is focused on the differences between cryptodire and pleurodire turtles and how their body plans affect their locomotion. The first project I worked on with Christopher was on the aquatic stability of turtles at differing flow speeds. During this project, I learned a very valuable lesson that I will carry with me throughout my career: scientific research requires a great deal of patience. Studies on kinematics and locomotion often require you to entice an animal to move from point A to point B, and turtles are surprisingly obstinate creatures; persuading them to chase a worm in flowing water was a challenge. Getting past that hurdle and actually collecting video data was an interesting and edifying experience.

For my second and final undergraduate project, we set out to explore how differing body plans of cryptodires and pleurodires affect their muscle activation, which in turn affects their movement. Pleurodires exhibit a derived feature in which their pelvis is fused to their shell. This leads to different locations of muscle origination and our experiment tested whether or not this difference affects their locomotion and the timing of their muscle activation. I was fortunate to

have an opportunity to be more involved in this project and really experience every part of the process from planning to execution to data analysis and presentation of results. Through a grant provided by Clemson University's Creative Inquiry program, I was able to work on the project through the summer. Similar to the stability project, this one was not without its frustrations. To collect muscle activation data, we needed to use electromyography techniques. This involved implanting very small wires into the turtle's muscles and measuring muscle activity while they swam in flowing water. This required a great deal of care and caution because one false move could result in wires being pulled out and data being lost. It was a nerve-racking but valuable experience.

Through both of these projects, I have learned a lot about dealing with the highs and lows of research. The frustrations and complications of data collection and analysis followed by the excitement of getting interesting results really sums up the scientific process. It can be tough and stressful, but in the end, you are answering important questions and finding out things that nobody else knows. The prospect of being the first person in the world to know something new about how turtles move and how evolution has shaped their locomotion makes it all worth it. My undergraduate research at Clemson has further solidified my desire to pursue research as a career, and it has taught me invaluable lessons on what it means to be a scientist. Having the opportunity to work closely with so many talented and motivated scientists has also given me a model of the type of independent researcher I aspire to be.

Teaching Experience: I discovered my penchant for teaching while sitting on the floor of my freshman dorm. I had offered to help one of my fellow students with a Chemistry assignment, and soon one turned into a dozen. This quickly turned into a routine of sorts, and on the nights before quizzes or exams I would have a crowd of panicked students huddled around me asking questions. I loved every minute of it. I loved seeing the transition from confusion to comprehension and I loved seeing the excitement and relief on someone's face when they realized they understood a difficult concept. Through the recommendation of my general chemistry professor, I moved from informal cram sessions in my hall to working as a supplemental instructor for Clemson's Academic Success Center. Supplemental Instruction (SI) is a program designed to help students take charge of their own learning. Instead of lecturing or holding question and answer sessions, my job was to create an environment where students could work collaboratively and learn from each other. One of the main tenants of Supplemental Instruction is to avoid directly answering questions at all costs. This seems counterintuitive, but it forces students to examine their patterns of thinking and work toward their own solution. This is a relatively challenging job and requires a strong fundamental knowledge of the subject as well as an ability to communicate effectively. This experience has taught me that I love the challenge of helping a student work through a difficult concept. It is extremely rewarding to see a student have that "light-bulb moment" where everything they have been struggling with suddenly makes sense. Working in the SI program has not only solidified my knowledge of general Chemistry, but it has showed me that I am passionate about teaching. Passionate teachers

are absolutely essential to the furthering of science education and research, and I hope to be as influential to my future students as my professors have been to me.

Graduate Plans: Though my scientific foundation was built in the field of biomechanics, I am venturing into a new field for my graduate work. Under the advisement of Dr. Dan Warner at Auburn University, I plan to focus my research questions on ecology, physiology, and evolution. Specifically, I will be studying the contribution of maternal effects in shaping the evolutionary landscape. Maternal effects fall at the juncture of genetics and environment and have a unique and important role in offspring viability, survival, and ultimately, their fitness. This research is very exciting as it has implications in conservation as well as a vast array of unanswered questions. It is a wide-open field, and I look forward to making a contribution to our understanding of this unique facet of evolutionary biology.

Broader Impacts: As a student who has benefitted immensely from the investment of so many professors and mentors, I would like to in turn help other budding scientists gain research experience and find their niche within the scientific community. Funding from the GRFP will allow me to develop a hands-on lesson for local high school students in collaboration with Science In Motion, an Alabama state-funded and Auburn facilitated initiative. Science In Motion provides materials, lesson plans and training to local teachers while also meeting core curriculum standards required by the state. Our lesson would include a video documentary of our time in the field, a field simulation kit to provide hands on experience, and it will meet the core curriculum requirements relating to observation, data collection, and analysis as well as concepts of evolutionary change. This project has the potential to have a huge impact in a state like Alabama where STEM education is poor. Working with Science in Motion would also allow us the opportunity to train teachers directly in our field techniques so as to reach students beyond the timeframe of my research project. Furthermore, I hope to create a project that will allow for collaboration with undergraduate students. Undergraduates will work closely with me on a project that will ultimately result in co-authorship of publications produced from the research. I have benefitted enormously from the guidance and wisdom provided by the graduate students in the Blob lab, so I would like to provide that opportunity for other students.

Conclusion: My time at Clemson has cultivated in me a thirst for knowledge. From that first biology lecture my freshman year, my academic and research experiences have molded me into the motivated student and budding academic I am today. My teaching experiences have also given me a passion for sharing my knowledge with others and influencing them to use their talents and reach their full potential. The opportunity to work as an NSF graduate research fellow will allow me to grow as an independent thinker, advance scientific knowledge through research, and share that knowledge with others through teaching and outreach.