It turns out that when shavings of sodium metal hit a wet cinderblock wall, they explode: a piece of information my brother and I discovered, to the chagrin of our parents, in our backyard. My upbringing was rich with Mr.Wizard-esque experiments like this, having been fascinated with science before I even knew what science was. If asked to pinpoint a beginning, my first thought is to tell the story of Louis Pasteur, a book that I insisted be read to me so many times when I was five that even to this day my father laments about how sick he is of that book. When I was a child, this story inspired me to believe that I could also make exciting scientific discoveries. As a ten year old, I spent afternoons when I got home from school drawing leaf shapes, dissecting berries, and looking inside seeds. I would then look up these plants to learn about all the things that people use them for, cataloging this information into a notebook. Years later, I looked back through these notes, reading my sloppy handwriting on construction paper, "*Actaea spicata*- Ranunculaceae USES- Antispasmodic, juice of berries + alum yields black dye, American species used for Rattlesnake bites. Berries are poisonous." I now realize that the question that really nagged at me was: How did these chemicals come about? At the time I only had a vague understanding of evolution, but I did know that I was insatiably curious to know how both nature and humans could shape these important molecules. Looking over these notes for inspiration, I realized that this was really the beginning of my interests in the evolution of natural toxins. The only thing that has changed from age 5 to age 10 to age 26, is that I have gained a depth of scientific understanding that has helped me refine the questions that have captured my interests since I was child.

As I delved further into the evolution of natural toxins in my formal studies at Tulane University (TU), I realized two important things: that the vast majority of research on co-evolution and natural toxins is focused on plant-herbivore interactions, and that to gain a complete understanding of these interactions, I would need an understanding of their historical and cultural impact, as well as their biology. To do this I decided to double major in Environmental Biology and Anthropology, through which I gained an appreciation of the depth of understanding that can be gained by looking at scientific problems through the prisms of diverse fields. Simultaneously, I saw that the tradition of examining these questions through botanical models has resulted in a paucity of information about *vertebrates* that produce complex natural toxins. Fascinated with questions about natural toxins in vertebrate systems, I found myself uniquely poised at the intersection of two academic fields. My questions were not only biologically interesting, but culturally, socially, and medically relevant. I had figured out the discipline that interested me, but it wasn't until I began research of my own that I learned how much I love the process of research and discovery.

In conducting independent molecular research, I gained both a greater understanding of evolutionary processes and an appreciation for the joy of making truly novel discoveries, which has driven me in pursuing a career in science. As I began to think about what kind of research program I would design, I was heavily influenced by two experiences. One was working on a project resolving the taxonomy of a thought-to-be extinct frog, in which I helped interpret how results should be applied to restoration projects and environmental laws. The result of this work was a publication in *Conservation Genetics* and the selection of this species as a target for site reintroduction. The second influence came when I attended a PhD defense at TU, for an ethnobotanical study that utilized interdisciplinary collaborations to include biomedical testing of botanical compounds. Both of these experiences showed me how thoughtful collaborations and effective communication of research can seamlessly fuse basic and applied science. This insight was the inspiration for me to start forming the basis of my present dissertation, which will integrate multidisciplinary perspectives to synthesize my varied interests.

After graduating, I felt that I needed a greater diversity of experiences in order to further hone my bigger evolutionary questions. One of these experiences was a position at TU in which I managed a research project assessing the impact of the 2010 Gulf oil spill on salt marsh reptiles. A major challenge in this project was that it was not possible to trap-capture our study species. To surmount this difficulty, I created an outreach program by talking to local fishing communities in order to collect live by-catch from local fisherman. This was a delicate process, because laws mandating use of Turtle Exclusion Devices (TEDs) had caused much friction between these small fishing communities and the scientific community. By bridging this gap, I was able to capture this species, as well as access knowledge from the local community, while educating and inspiring enthusiasm about the importance of wetland research. This project taught me to trust in my ability to solve hard problems using not only my skills as a biologist, but also as a member of the community. Most importantly, I learned first-hand what an immense amount of mutual enrichment can be gained by engaging diverse communities in scientific research.

As I considered my next steps, and having excelled in academic research, I asked myself: “Was I only pursuing academic research because it is the only kind of research I have done?” To answer this question I decided to try working in the industrial and applied sciences. In this field, I consistently found myself frustrated: it was my job to apply methods, not develop them, and when I saw a flawed design or a vital question slip through the cracks, I was not in a position as a scientist to improve upon these methods or to ask more appropriate questions. With this valuable experience I learned that I am happiest in an environment where I can challenge the questions being asked, the ways in which they are answered, and postulate *new* questions and methods to unveil important natural truths. This experience gave me a sense of ease that I had not previously felt: I was clear-minded and confident about what I wanted to do with my life, and now my objective is simply to accomplish it.

All of my experiences in science thus far have given me the perspective to separate myself from the systems in which I have worked and ask myself again about the essential questions that drew me to biology. How do species interactions mold the biochemical products of evolution? What are the genetic mechanisms (e.g., mutation and gene duplication) within species that regulate evolutionary processes? Even more importantly, how can our knowledge of such mechanisms in an evolutionary context shed light upon basic principles of gene regulation and evolution? The biological interaction that kept popping out as one with extremely rich potential for both theoretical and practical applications in the context of these questions was no longer plant toxins and resistant herbivores, but the evolution of resistance to snake venom in mammals. This system is both rich in molecules that are directly bioactive in mammals (and has been a source of novel pharmacology for hundreds of years), and has the potential to reveal basic mechanisms of mammalian gene mutation, regulation, and evolution. From an anthropological viewpoint, this system also has the potential for tremendous influence on communities that are greatly impacted by snakebite, both by influencing treatment as a result of research, and in engaging these communities in scientific research and education. It was this realization that brought me back to the stories of Dr. Pasteur, and the message I had missed as a child reading about how a relentless, seemingly esoteric pursuit of some basic questions about tiny creatures in a test tube changed the history of medicine forever. In his own words, “There does not exist a category of science to which one can give the name applied science. There is science and the applications of science, bound together as the fruit of the tree which bears it.” I find it appropriate that the person whose story and wisdom drew me to science as a child is the person to whom I now look back as I define and pursue my own nontraditional multidisciplinary research.