My name is [insert] and I am interested in pursuing a graduate degree in Neuroscience at University of Texas Austin (UTA) to continue to expand my knowledge of neural disease states and neuroglia. Ultimately, my goal is to conduct laboratory research at the National Institute of Health, Woods Hole Oceanographic Institute, and become involved in the Human Brain Project in Europe. I am confident that UTA's Neuroscience program is the right graduate program for me for three reasons: I have similar interests with several of the primary investigators; I am also interested in conducting holistic research, as well as wanting to be a part of the exciting atmosphere of UTA's first-class research.

My undergraduate experience is comprised of a diversity of research experiences, all of which contributed to my decision to become a neuroscientist. My research career began at Franklin and Marshal College in the psychology primate lab. I measured learning curves of Capuchin monkeys as they matched like and different objects for two summers. The animal behavior lab and research project overall introduced me to computer programming and taught me how to apply theory to experimental methodology. My interest in different avenues of animal behavior led me to explore Marine Mammal science in Gulfport Mississippi for a summer. I learned field research skills and veterinarian science, but more importantly, I realized that I wanted to study the cellular mechanisms of behavior and in a laboratory setting. Consequently, I contacted a professor at Lock Haven University of Pennsylvania (LHUP) about his Pennsylvania State University connections and a potential research project in neurobiology. Thus, my career into neuroscience began.

In the neurobiology lab, I dissected, stained, and analyzed transgenic, murine brain tissue. The lab analyzed the effects of M5 knockouts on acetylcholine deficiency, as well as the cellular effects of the Polished and Reinforced Thinned Skull Surgery (PoRTS). As a result of this research, I became increasingly curious about degeneration, various disease states, and new techniques for analyzing awake and conscious brain tissue. The individualized project provided me with the autonomy to explore new techniques for analyzing tissue and to ultimately devise an independent project worth presenting. I have worked in various labs and tested many different research types but none was as exciting and fascinating as my experience researching M5 Knock outs and PoRTS windows.

I am further interested in UTA's Neuroscience program to have the opportunity to work with the primary investigators. I am interested in working with Dr. Kristen Harris and her lab assessing synaptic plasticity, memory, and pathology. I am also interested working with Dr. Hitoshi Morikawa to use various physiological techniques such as electrophysiology to assess the dopaminergic system. In addition to the institution, Austin, Texas would be an exciting city to live.

My choice to attend LHUP for my undergraduate studies was the best decision I could have made for several reasons. The faculty-student ratio allowed me to build relationships with professors as well as serve as a lab assistant; I was chosen by the Global Honors program to

study abroad on a scholarship; I had the opportunity to publically present my research at both regional and national conferences; and I have logged 600 hours of community services serving two terms as an AmeriCorps Member.

All of these experiences increased my confidence and opened my mind to new places, people, and ideas. They helped shape me into the person I am today: an aspiring neuroscientist.

Please feel free to contact me via email or phone if you should have any questions or require more information about my academic background and experience. Thank you for your time.

My relationship with science has morphed significantly over the past few years as my interests and pursuits in the field of biology have become more focused. As a result, my career path has also changed. When I started my studies in biology at the University of Dallas, I wanted to become a doctor. I had a strong inclination toward medicine and sought to pursue this field. Over the course of my first two years and after being exposed to various aspects of biology, I realized my true passion in science and medicine did not lie in being a physician, but rather, in the research that improves the medical field's understanding and treatment of disease.

During my sophomore year, I took a microbiology course that cultivated this interest in research. In the lab for this course, the professor had us perform various tests on an unknown strain of bacteria and decipher both its genus and species from the results. I found this task exciting, and I enjoyed spending time in the lab doing tests that helped in determining the bacteria I was given. The ability to learn about an organism, and discover details through experiments, showed me the aspect of biology that I wanted to continue in, hands-on discovery.

With this new-found interest in research, I sought out opportunities to gain laboratory experience. In the summer of 2017, I joined Dr. Nigel Calcutt's lab in the Pathology department at the University of California, San Diego. I was placed on the project entitled, Efficacy of Cyclopentolate on Peripheral Neuropathy in Diabetic Mice. In this study, we looked toward a topical treatment to regrow nerves that had been damaged due to diabetes. We chose to study the effects of cyclopentolate due to previous results the lab had discovered involving the pathways for regrowth of nerves. Mice were used as our model for the study, and focus was given to the nerves found in the cornea. Originally, this experiment was a preventative study of neuropathy in diabetics, but due to unforeseen obstacles in the procedure, we adapted and changed it to a reversal study. A significant portion of my job was to analysis images of corneal nerves to track deterioration and regrowth throughout the study. This task was very time consuming, and analysis was done outside of everyday care for the mice and additional tests for nerve function. While it was a challenge to complete the analysis by the deadline given to me, I was able to utilize and grow my ability to maintain a set schedule for the successful completion of the task. Through our work, I was able to give a presentation at the Summer Research Conference at UC San Diego. Additionally, once all terminal data is analyzed, the findings of the study will be published within the next year. Due to the experience I attained from the Calcutt Lab, I was able to confirm that research is the career path I want to pursue.

At the start of this past semester, Fall 2017, I joined Dr. William Cody's molecular biology research lab at the University of Dallas. The project I work on is in collaboration with Dr. Deanna Soper's evolutionary biology lab, and focuses on the coevolution of infectious disease using the host *Drosophila melanogaster* and the pathogen *Pseudomonas aeruginosa*. The experiment is comprised of a chronic infection model of the two organisms, and it is a continuation of previous literature characterizing the virulence factors of the pathogen. We are examining virulence from the perspective of a long-term coevolutionary relationship between pathogen and host. This project is a preliminary study, and the procedure continually adapts with each new problem we encounter. Since this is a joint project, I have the chance to work in a dynamic setting that operates with two principal investigators controlling the direction of the project. I also work in collaboration with two other students to oversee the completion of each infection and overall maintenance of the fly population. Our work on this ongoing study will be presented next spring at a Texas Branch Meeting of American Society for Microbiology.

In addition to my B.S. in biology, I am also completing a concentration in molecular biology. The courses I have taken to fulfill this concentration have shown me the aspects of biology I am most passionate about. Learning the underlying mechanisms of a cell and the factors that allow it to function became of particular interest when I took molecular biology. I

enjoyed spending time dissecting the information, even when certain concepts were difficult to grasp. Additionally, I appreciated the application that molecular had to other fields, such as its joint consideration with microbiology, genetics, and its involvement in understanding host-pathogen relationships. I knew the joy I had when studying the subject was an indication that this is the area of biology that I want to be involved in and contribute to.

My experiences in research and the classes I have taken allowed me to consider the biological questions that I am most curious about. I am fascinated by mechanisms of DNA regulation and how organisms infect hosts, and I want to explore the possibilities of treatment for prominent diseases. These considerations have led me to the research being done at Boston College. Specifically, Drs. Anthony T. Annunziato, Welkin Johnson, and Thomas Chiles are working toward answers to biological questions of interest to me.

Over the course of four semesters, I have worked as a lab assistant for General Biology, Basic Ideas of Biology, and Disease and Society. Through this job, I gained valuable skills in the laboratory, such as the ability to comprehend procedures and explain them to others, to make media used in labs, specifically for the growth and identification of bacteria, and to communicate with both students and faculty for the success of the lab. Two of the labs I have worked in were geared toward non-science majors looking to fulfill their life science requirement. Most of these students had little interest in or understanding of scientific processes and concepts. As their lab assistant, it was my job to instill a level of scientific understanding as it pertained to the lab. While difficult at times, I successfully aided students through experiments and brought them to scientific literacy.

Prior to starting at the University of Dallas, I was given the privilege of receiving a scholarship from my university to attend the O'Hara Chemical Sciences Institute. This allows students to complete both semesters of General Chemistry before the start of their freshman year. This honor was given to only twenty students and provided for a rigorous summer filled with scientific learning. The ability to participate in this program and complete these courses early gave me the opportunity to take more biology courses than I otherwise would have been able to. In addition to this scholarship, I was also the recipient of the Provost's scholarship, an academic achievement award, for the full four years at my university.

From the work I've done in both research and classroom lab settings, I have come to learn that research is a true passion for me, and I am capable and ready to pursue the task of investigating key concepts of biology. The Biology Ph.D. program at Boston College provides the curriculum and research projects that I am looking for in a Ph.D. program, and I know I will thrive in my graduate studies here.

CURRICULUM VITAE
Brittany Elizabeth Knight

Contact Information:

INSERT

EDUCATION:

Second degree: 9/13 - 05/14: Lock Haven University, Lock Haven, PA.
***Major*:** Biology
Fall Courses: Organic Chemistry I, Genetics, Computer Programming, Sensation & Perception

Bachelors of Science: 09/09 - 05/13: Lock Haven University, Lock Haven, PA.
Major: Psychology
Minor: Biology
GPA:
Global Honors with Distinction, Phi Kappa Phi, Psi Chi

High School: 9/05 - 06/09: Lampeter Strasburg High School, Lampeter, PA.
National Honors Society

Research Experience:

Spring 2013: **Neurobiology Independent Study (part 2)**
Departments of Biology, Lock Haven University, Lock Haven, PA
Advisors: Dr. Justin Ingram
Title: A Qualitative Analysis of Cell Viability in Polished and Reinforced Thinned Skull Models
Skills: DIC microscope, Sputtering, Microtome (Rat and mouse samples), H&E stain, Nissl stain

Spring 2013: **Psychology Independent Research**
Department of Psychology, Lock Haven University, Lock Haven, PA
Advisor: *Dr. Kevin Morrin*
Title: *The Effect of Fear and Disgust Content in PSA's on Audio Recognition and Self-Efficacy*

Fall 2012: **Neurobiology Independent Study (part 1)**
Departments of Biology, Lock Haven University, Lock Haven, PA
Advisors: Dr. Justin Ingram
Title*: Analysis of blood brain barrier cell viability in the M5 Muscarinic Acetylcholine Knockout mouse model*
Skills*: DIC microscope, Microtome (Rat and mouse samples), H&E, Nissl, & Methylene Blue stain*

Spring & Fall 2012: **English Independent Study/ Honors Capstone**
Departments of English and Psychology, Lock Haven University, Lock Haven, PA
Advisors: *Dr. Richard VanDyke and Dr. Tara Mitchell*
Title*: Perspective Taking and Trialectics Analysis of Hydraulic fracturing in Lock Haven, PA*

Summer 2012: **Institute for Marine Mammal Studies: Research Internship**
Gulfport, MS
Advisor: *Ms. Jamie Klaus*
Projects: Photo identification and abundance data analysis of Atlantic Bottlenose dolphin.

Fall 2011- Spring 2012: **Psychology Independent Study**
Department of Psychology, Lock Haven University, Lock Haven, PA
Advisor: *Dr. Mark Cloud*
Title: *Perspective Taking and Stereotyping.*

Summer 2011: **Hackman Summer Volunteer Researcher**
Franklin and Marshall College, Lancaster, PA
Advisor: *Dr. Roger Thompson*

Co-researchers: *Caitlin Knierim and Ellen Fonte*
Title*: Identity and nonidentity of relational match to sample tasks with 10 Cebus capucinus via touch-screen*

Fall 2010: **Research Methods Augmentation (PSYC202)**
Department of Psychology, Lock Haven University, Lock Haven, PA
Advisor: *Dr. Mark Cloud*
Title: *The Cooking Hypothesis*

Summer 2010: **Hackman Summer Volunteer Researcher**
Franklin and Marshall College, Lancaster, PA
Advisor: *Dr. Roger Thompson*
Co-researchers: *Caitlin Knierim and Ellen Fonte*
Title*: Continued: Identity and nonidentity of relational match to sample tasks with 10 Cebus capucinus via touch-screen.*

Awards and Nominations:

Spring 2013: **First Place winner at the Phi Kappa Phi Research Symposium**
Title: A Qualitative Analysis of Cell Viability in Polished and Reinforced Thinned Skull Models
A Pennsylvania State University research affiliated and supported project

Fall 2012: **Induction Phi Kappa Phi**

Spring 2012: **Induction Psi Chi International Honor Society for Psychology**

Spring 2012: **Psychology Department Achievement Award:** **For Excellence in the Field of Psychology**

2010, 2011, 2012: **Nomination for Global Honors Student of the Year**

Spring 2011: **Global Honors Academic Scholarship**

Summer 2011: **PASSHE Global Honors Summer Scholarship**

Fall 2009, Spring 2010, Fall 2010, Fall 2011 Spring 2012, Fall 2012, Spring 2013 **Lock Haven University Dean's List**

Related Work Experience:

Spring 2011 – 2013: **Biology Department Laboratory Assistant**
Lock Haven University, Lock Haven, PA
Employer: Dr. Shonah Hunter

Fall 2012 **Microbiology Laboratory Assistant**
Lock Haven University, Lock Haven, PA
Employer: Dr. Joseph Calabrese

Summer 2012 **Institute for Marine Mammal Studies: Research Internship**
Gulfport, MS
Advisor: Ms. Jamie Kraus

Fall 2011 – 2012: **Group Peer Tutor**
Lock Haven University, Lock Haven, PA
Courses: Research Methods in Psychology, Cultural Anthropology (ANTH102), and Principles of Biology (BIOL106, 107)

Summer 2010 & 2011: **Hackman Summer Volunteer Researcher**
Franklin and Marshall College, Lancaster, PA
Advisor: *Dr. Roger Thompson*

Co-researchers: *Caitlin Knierim and Ellen Fonte*
Title*: Identity and nonidentity of relational match to sample tasks with 10 Cebus capucinus via touch-screen.*

Presentations/ Conferences:

Spring 2013: **Phi Kappa Phi research symposium: Lock Haven University**
Oral Presentation: Neuroscience Independent Research
A Qualitative Analysis of Cell Viability in Polished and Reinforced Thinned Skull Models

Spring 2013: **Central Commonwealth of Pennsylvania University Biologists (CPUB)**
Poster Presentation Neuroscience Independent Research
Analysis of blood brain barrier cell viability in theM5 Muscarinic Acetylcholine Knockout mouse model

Fall 2012: **National Collegiate Honors Conference: Boston, MA**
Poster Presentation Honors Capstone
Nomination for Best Poster Presentation

Spring 2012: **Northeast Regional Honors Conference: Baltimore, MD**
Paper Presentation: A Copyright Infringement on Mother Nature
Poster Presentation: Perspective Taking and Stereotyping

Spring 2011: **Northeast Regional Honors Conference: Portland, ME**
Poster Presentation: Deforestation and the Biodiversity of the Brazilian Rainforest
Round Table Discussion: How is the Technology Shaping Childhood?
Paper Presentation: The Recolonization of America via Facebook

Spring 2010, 2011 2012, 2013: **Lock Haven University Day of Scholarship**
Lock Haven University, Lock Haven, PA
Paper Presentation: *Digital Space, Francesco Petrarch, and Times Square, NY (2010)*
Paper Presentation: The Recolonization of America via Facebook (2011)
Poster Presentation: Perspective Taking and Stereotyping (2012)
Poster Presentation: Analysis of blood brain barrier cell viability in the M5 Muscarinic Acetylcholine Knockout mouse model (2013)
Phi Kappa Phi symposium: A Qualitative Analysis of Cell Viability in Polished and Reinforced Thinned Skull Models (2013)

Spring 2010: **English Association of Pennsylvania State Universities**
East Stroudsburg University, East Stroudsburg, PA
Paper presentation: Digital Space, Francesco Petrarch, and Times Square, NY

Leadership Experiences:

2011 - Present: **Group Peer Tutor**
Lock Haven University, Lock Haven, PA
Course work: Research Methods in Psychology (PSYC202), Psychological statistics (PSYC205), and Cultural Anthropology (ANTH102)

2010 - Present: **Public Issues Forum Coordinator and Moderator**
Global Honors Program, Lock Haven University. Lock Haven, PA
Organize forum ideas, plan and moderate discussions in small groups.

Fall 2010: **LHU Global Honors Program Admission Team**
Lock Haven University, Lock Haven, PA
Organized admissions and met with prospective freshman and matriculated students, interviewed prospective honors students for the program

Community Service: (Total hours: 800)

2011 - 2012: **Scholar in Service to Pennsylvania**
Mountain Serve, *Lock Haven University, Lock Haven, PA*
300 hr. commitment
Coordinating community service projects in Clinton County, PA

Summer 2011: **National Council of La Raza AmeriCorps Summer Intern**
La Academia Partnership Charter School, Lancaster, Pa
300 hr. commitment
Duties included: Student mentor, Teacher Assistant, summer program volunteer

Spring 2011: **The David School, Mountain Serve Alternate Spring Break Trip**
Lock Haven University, Lock Haven, PA
Project: Mentoring at risk youth, providing service to the David School and David, KY.

Related skills, Affiliations, and Experiences:

Fall 2011: **PADI Open Water Certification**
Certification in the Susquehanna River, Lock Haven, PA

Spring Break 2012: **Woods Hole Oceanographic Institute & Marine Biology Laboratory Workshop**
Woods Hole, MA
Speaker Series & Facilities Tour

Spring 2011 **Externship: Hershey Medical Center Neurology Department**

Programming: **Java**

References: