Sensory perception inspired my interest in neuroscience. As a classically trained vocalist, I first became fascinated by how auditory stimuli evoke emotional responses, which grew into a passion for understanding how sensory perception connects the physical and the mental worlds. Opening up the "black box" between sensory stimuli and behavior has become my main intellectual drive in investigating the brain. Researching the mechanisms underlying these processes has been incredibly rewarding, and compels me to delve deeper into the neurobiological complexities of the brain, underlying my resolve to pursue a career in neuroscience. With the opportunities afforded to me through a Ph.D., I hope to contribute to research in the field of sensory perception.

As a sophomore at Barnard College, I investigated the role of oral stimulation of sweet taste on pancreatic insulin release in Dr. John Glendinning's lab. We were surprised to find that a mouse model deficient for the T1r3 sweet taste receptor, despite being unable to detect sweet taste, produced a robust insulin response similar to wild-type mice when licking sugar solutions. These results suggested that oral-stimulated insulin release occurs through a pathway independent of conscious perception of sweet taste. It was thrilling to see how our work suggested a new pathway for transducing information about sugars and the input underlying insulin release, even opening up the door to a new mechanism of chemosensation.

Eager to learn more about sensory research, I did a summer internship at Princeton University in the lab of Professor Mala Murthy. I worked on developing an appetitive olfactory conditioning assay for testing individual *Drosophila melanogaster*. Using a series of lasers that tracked the changing position of flies in individual tubes, the assay identified which flies had developed an odor preference after appetitive olfactory conditioning. These flies were then used to study "memory traces", physical or chemical manifestations of memory, through electrophysiology and surveying for mRNA expression changes within neurons in olfactory learning circuits. The creativity of this assay's design astounded me and built upon my growing fascination for assays engineered to reveal model organisms' perceptual experiences.

Additionally, working for the first time in a lab with post-docs and graduate students, I was inspired by everyone's intelligence and motivation and able to see a career path in research for myself more clearly than ever before.

Motivated by the techniques I had seen in the Murthy lab, upon returning to Barnard, I chose to learn electrophysiology to further investigate the ways that sensory stimuli are coded by the nervous system. My senior thesis focused on the effects of alcohol consumption by rats during pregnancy on their adolescent offspring's peripheral nerve response to ethanol. Recording from live nerves was my most challenging experiment yet, and taught me the patience and work ethic required to develop the technical skills needed to succeed in research. The obstacles I faced in this project and throughout my research showed me the vast complexity of neuroscience problems—which reinforced my passion to solve them.

After graduating, I was determined to work in research full-time. I joined the lab of Dr. Eric Kandel. Working with Dr. Eleanor Simpson, I investigated the role of tonic dopamine levels in regulating motivation. I was responsible for this project on every level, from contributing to the experimental design to executing each protocol, requiring me to draw from all my previous research experiences. I learned stereotaxic surgery for cannula guide implantation, how to perform *in vivo* microdialysis on awake, behaving animals, developed a new method for histological evaluation of probe placement, and taught myself Matlab to design new analyses for behavioral data.

Working in the Kandel lab, I have matured significantly as a scientist. I have gained confidence in my intuition to make decisions when research poses difficult questions, and the experience required to independently carry out complex and demanding projects. When I began microdialysis, I slowly realized that there were several problematic confounds in the protocol that prevented us from accurately measuring dopamine concentrations. After troubleshooting and working with an analytical chemist, I developed a more accurate method for extracting and measuring dopamine samples. After months of collecting data, my results were consistent and

precise, which was an accomplishment on its own. The data also indicated that our experimental treatment, a serotonin 2c receptor selective ligand that increases goal-directed effort, correlated with increased tonic dopamine levels in the dorsal medial striatum, possibly resulting in increased motor efficacy or effort allocation. As we prepare the results for a paper, thinking through the possible interpretations of what these results mean for the neural mechanisms of motivation has been extremely exciting.

In order to best contribute to the leading questions at the frontiers of neuroscience, I am committed to approaching my own research from an interdisciplinary standpoint to arrive at the most innovative approaches and conclusions. For this reason, I am drawn to the Rockefeller University graduate program for its encouragement of multidisciplinary collaborations, and its leading and scientifically diverse faculty. Rockefeller University's wide array of strong sensory perception research, including the labs of investigators such as Professors Ruta, Vosshall, and Magnasco offer an excellent fit for my research interests and a range of opportunities to better understand the complex interactions between fields of neuroscience. Through the Rockefeller University graduate program's flexible curriculum, I am also eager to explore my interests in engineering and computer science, and the potential to use these perspectives within neuroscience through continuing my interest in building assays for measuring model organisms' behavior and sensory experiences. As a graduate student, I also plan to engage with organizations like the Science Communication and Media Group and WISeR, because public perception of science, on local and global levels, as well as supporting women in the sciences are extremely important causes to me. With a Ph.D. from Rockefeller University's graduate program and experience with the exceptional investigators and unique interdisciplinary scientific community at Rockefeller, I will be well prepared to pursue innovative directions in my research and a successful career as a scientist.