

In the Spring of 2015, I immigrated to the United States of America to attend college after living in Ghana for most of my life. Malaria is endemic in Ghana and I contracted the disease as a young child. I had many encounters with various doctors and each encounter shared a common element; there was an undeniable lack of empathy that made me question the healthcare system and also made me curious about how it could be improved. I enrolled in the Community College of Baltimore County (CCBC) with the intent to pursue medicine derived from my interactions with the healthcare system in Ghana. While there, my passion for medical research was sparked and I developed a desire to help individuals in a clinical setting.

While at CCBC, I enrolled in a Microbiology class that opened my eyes to the scientific laboratory. In that class, I cultured and manipulated bacteria, viruses, and other microbes for the first time in my life. This experience led me to enroll in a Summer 2017 internship program at the University of Maryland Baltimore County. I worked with Dr. Tagide deCarvalho and sought to identify the diversity of bacteriophages in freshwater. We aimed to broaden the knowledge on bacteriophage-bacteria interactions and found distinct families of bacteriophage previously not characterized in freshwater environments. This led to another research internship that same summer, where I worked on a project that included identifying the phyla of microbes that inhabit the bellybutton based on how frequently individuals washed. This was interesting because it combined my love and curiosity for medicine and research. This project led to interesting results as we saw a correlation between the wash frequency and presence of certain phyla of bacteria in bellybuttons. Through these projects, I discovered my fascination with microbiology and immunology, and was really interested in applying research in these areas to real-world scenarios.

To further explore my interest in medical research, in the Summer of 2018, I participated in a research program at the Johns Hopkins School of Medicine (JHSOM), under the mentorship of Dr. Mahendra Damarla. For this project, I examined the role of caspases in the migration and proliferation of Human Microvascular Endothelial Cells (HMVECs). This cell type, usually disrupted in patients with pulmonary injury, is essential to recovery from this injury. The project also led to some interesting conclusions as we discovered a correlation between lack of caspase-3 and low endothelial cell migration rates. This research, although not rooted in microbiology and immunology, deeply interested me because of how immediately applicable it was in treating individuals who suffer from pulmonary-related injury. The research I did in Dr. Damarla's laboratory mirrored the type of research that I hope to do in my future work because it was applicable to a clinical setting and we sought to reduce risk of pulmonary diseases caused from injury.

Through this experience at JHSOM, I also interacted with individuals who had obtained MD/PhDs and were successfully practicing medicine and carrying out research. I had the chance to go on rounds with one of these physician scientists in the Intensive Care Unit of Johns Hopkins Hospital. I witnessed the thought process doctors undergo to determine the actions required to ensure the health of their patients. I also noticed the teamwork needed as a unit of attending physicians, residents, interns and nurses pulled ideas together for the

effective treatment of the patients in the ward. I have also learned how to work as a team which would be beneficial to this aspect of medical care.

This teamwork and dedication were not part of my healthcare experience in Ghana, and I plan to incorporate it in all aspects of my life. These virtues of doctors were also evident when I served as a volunteer at St. Agnes Hospital in the Spring of 2019. I had the opportunity to give back to individuals in the Adult and Pediatric Emergency Departments. I was also able to shadow doctors and gain an in-depth look into the routine of these doctors. To further solidify my understanding of how doctors operate, I shadowed Dr. Owusu-Boaitey, an emergency internist at Baltimore-Washington Medical Center. These experiences have both primed me to be in a hospital setting and shown me the basics of interacting with patients in a clinical setting.

With such a strong passion for research tied with my desire to practice medicine and my training as a MARC U*STAR Scholar, Meyerhoff Affiliate and STEM BUILD Trainee, my main career goal is to be a physician scientist. I also desire to become a faculty member at a medical university, training the next generation of medical scientists, similar to what I have been doing as a teaching assistant and tutor at my university. I hope to accomplish this by enrolling in an MD/PhD program with a focus in Molecular Microbiology, Immunology and Genetics. To further strengthen my research skills, I am enrolling in University of Maryland, Baltimore's postbaccalaureate research program (STAR-PREP). The training offered through an MD/PhD program will award and solidify the skills necessary to translate research to the clinic and bridge the gap between the bedside and the bench.