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Great Neck North High School

University of Massachusetts, Amherst, Dr. Laura Vandenberg (July 2018)

Great Neck Breast Cancer Coalition

This past summer, I found myself walking on the campus of UMass Amherst in the sweltering heat, looking for the lab that I would call my home for the next three weeks. After more than half an hour of receiving conflicting, back and forth directions from people passing by and feeling the heat exhaustion weigh on me, I finally found where I was supposed to be. A set of stairs welcomed me as I looked up at the warm bricks and adorning cream stones that had etched the top, “Goessmann Chemistry Laboratory.” A combination of excitement and anxiety beset my stomach as I knocked on the door. I was excited - I was being given the opportunity to work in a *real* lab, side by side such amazing, accomplished scientists - but I was also anxious - would I really know what’s going on?

Immediately, my worries were washed away as Dr. Vandenberg - or as she insisted on us calling her, Laura - gave a warm welcome as she ushered my lab partner, Amanda, and me into her cool walk in freezer, relieving us of the heat. She first gave us a tour of the lab. I was fascinated by all of the different machines she introduced to us. There were incubators, centrifuges, platform shakers, fume hoods, lab-grade freezers, microscopes, and more - all of which I had read about in classes, but never before had seen in person. As we recovered from the heat, I felt more than relief; I felt pure eagerness. I could not wait to get started in the lab and embrace all of the learning opportunities and hands on experience to give me a glimpse into the reality of science.

The opportunity to work under Laura was more than just working in the lab; it was also learning about the basis of environmental science and learning how to truly study science. Laura’s lab studies the effects of endocrine disruptors, such as BPA, BPS, and parabens, on mammary gland development. In order to take on such a specific, targeted study, first we needed to understand the basics of what the mammary gland is, what endocrine disruptors are, the history of them, and what all of this possibly means. Although there were only two of us, Laura really took the time and effort to teach us and make sure we understood. She treated us with the respect and dignity of college students but still made it accessible to the fact that we were in high

school. She would encourage us to think beyond what we know and ask questions. Her ability to insert positivity and light-heartedness into the serious nature of this subject really made working in the lab a treat.

Amanda and I were given tasks of staining slides and microscopy. At first, I was worried. It astounded me that possible evidence that could show a significant link between an endocrine disruptor and abnormal growth lay in the slides that I was being entrusted to properly stain and process. Additionally, the staining process is extremely time sensitive and particular. Admittedly, I did stumble on the first couple of runs. However, Laura was extremely forgiving and understanding. After running a couple more stainings, I got into the rhythm of it; I learned to be comfortable in the lab and not to hesitate to ask questions. Working in the lab is a learning process, but it was especially rewarding to know you are working on the forefront of science to possibly contribute something to the future.

Our projects specifically looked at the effects of oxybenzone and propylparaben (PP) on mammary gland development, when exposed in utero. I mainly focused on PP, which is known for being an estrogen mimicker. PP is commonly used as a preservative and antimicrobial agent in food packaging materials and personal care products. I was shocked to learn of its prevalence in everyday items where in one study, PP was found present in 100% of the urine samples from pregnant mothers. From analyzing all of the data from mice exposed to PP up to prenatal day 21, we measured and found abnormal growth consistent with other studies showing the potency of endocrine disrupting chemicals.

After three weeks in the lab, I emerged with a new perspective on science. The reality is that science is not often clear cut. There are many things that we can scratch the surface of, but it requires a lot of further study to truly understand. With research, especially, you cannot expect to always get favorable results so quickly. You could've committed so many hours to processing data of a certain trial just to see you're going to have to redo it. But that is the fun part! The trial and error, the personal pride and growth, the satisfaction you gain when you reach your end goal; these are the things that you can only really know if you work hands-on in the lab.

Overall, I enjoyed my short three weeks at Amherst. Besides receiving the once in a lifetime opportunity to work in a lab as a high schooler and seeing what science really was, I also had a great time outside of the lab! I became good friends with many of the other research students, including my lab/roommate, Amanda, and I enjoyed the independence of being a

college and living by myself. This entire experience has just made me more excited to pursue science in the future, and I could not thank GNBC enough for this amazing opportunity!