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Great Neck Breast Cancer Coalition Student Research Internship

University of Massachusetts Amherst, Vandenberg Lab

This summer has been one of the most exciting and insightful summers of my life. The summer going into senior year is one full of contemplation and self-reflection. Where am I going to apply to college? What am I looking for in a school? Who do I want to become in the next four years? My time spent at the University of Massachusetts Amherst in the Vandenberg Lab has helped me answer these life changing questions and has given me further perspective into what direction I want to take my future in.

My roommate and lab partner, Kayla, and I instantly fell in love with Dr. Vandenberg. Upon first meeting her, she instructed us to call her by her first name, Laura. It was astonishing to us how kind and warmhearted she was. She encouraged us to ask questions, compose our own hypotheses and discover our own answers. Additionally, she introduced us to the concept that science can be tedious, often repeating the same process for weeks. Though Laura's wonderful sense of humor kept things lighthearted in the lab, I would sometimes find myself feeling a little anxious and frustrated at the meticulous work, especially when something went wrong or one of us made a mistake. Laura enlightened us to the fact that we will not always succeed in science. In one example where we had difficulty with a histological technique, we learned that it is not the end of the world if the dye did not come out correctly – we could repeat our experiments and try again. Science is tricky and complicated, but we should learn from our mistakes and keep going. Failure is a part of science and life, but you just have to review the error and ensure you know how to prevent it next time.

The lectures given in the lab helped me to understand the importance of the work being done. During these lectures I learned that hormones work at very low doses, estrogen being one of them. Estrogen easily passes through the membrane and enters the nucleus to turn on genes. However, though crucial to one's body, estrogen can promote breast cancer cell growth. Xenoestrogens, such as, BPA, BPS and DDT, mimic estrogen by binding to estrogen receptors, thus increasing one's risk for breast cancer. Another word for these chemicals are endocrine disruptors. Endocrine disrupting chemicals or EDCs are exogenous chemicals or chemical mixtures that interfere in some way with the ability of hormones to activate receptors. The lab tested the effect that two synthetic estrogens would have on the mammary glands of pregnant mice (the F0 generation), her offspring (the F1 generation) and then the offspring's offspring (the F2 generation).

The work we did in the lab was unbelievable. One thing we did was processing whole mounts. When dissected from a mouse the mammary gland is a very small, fatty, white blob. The mammary gland must be spread on a slide and then processed. This includes dehydrating the gland, rehydrating, adding the

carmine dye and then dehydrating again. The process took several days, but at the end, the mammary glands looked beautiful and were ready to be viewed under a microscope. Another thing we did in the lab was excising pieces of the mammary gland. This entails cutting a square to the right of the lymph node. Once the tissue was excised we embedded it in paraffin wax. When the wax hardened, the tissue was taken to be sectioned. Sectioned tissue is one cell thick and allows us to gather very detailed information on the tissue.

It was humbling to know that we were being trusted with such outstanding equipment and critical work. The realization that the work done in the lab will have an influence over future policy and lives is incredibly motivating. Everyone in the lab was very encouraging and thoughtful of Kayla and me. They took the time to ensure that we understood the implications of the work we did. Everyone was immensely patient, making sure we appreciated the reasons for the procedures we were performing. The overall vibe in the lab was one of comradery and friendship. The undergraduates in the lab were enthusiastic to share their college experiences and always offered a helping hand. Spending my summer with such wonderful influences gave me further insight into what I wish to do with my future and the type of person I want to become.

Another amazing person that I met this summer was my roommate and partner Kayla. Kayla and I attend the same school, North Shore Hebrew Academy High School, but we had never had an actual conversation until this summer. Even the time leading up to the summer, when we knew we would be roommates and lab partners, the most communication we had was a wave in the hallway or a hello in the lunch line. I am so fortunate to have met such an amazing person. Finding someone who has similar passions as you is wonderful. The conversation never dulls because you both have so much to say about the topic. I feel truly blessed to have made such a wonderful life long friend. I look forward to spending more time with her as the school year progresses.

I would like to thank Laura Weinberg, Lisa Levine and everyone at the Great Neck Breast Cancer Coalition for this wonderful opportunity. Without them, this summer would not have been possible. I feel immense pride in the work I did and inconceivable gratitude towards them in giving me the chance to have this amazing experience. My time at the lab will not be forgotten and will certainly help me determine the path I will take during college. Lastly, I would like to thank them for giving me the fortune of meeting such outstanding people this summer. Everyone I met at UMass Amherst was nothing but courteous and delightful. I have made lifelong friends and met inspiring role models. Thank you GNBCC!