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GNBCC Students & Scientist Breast Cancer/Environment Research Program

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A half an hour early, Isabelle and I walked into Cheryl's office our first day with butterflies in our stomach. Even with all the assurances from prior students and the great reputation that the GNBCC has, I had no idea what to expect. I soon discovered, however, that there was no reason for my nerves. Soon Cheryl, the "great overseer," sat us down and explained everything we needed to know. Cheryl spoke of endocrine disrupting chemicals, schedules, and fellow lab workers. Cheryl also provided us with extra information in the form of research papers to read about real-world applications of the lab's work. The lab uncovered information that changed lives. For the first time in my educational career, I learned something that mattered. The experience broadened my awareness of scientific skills, consumer choice, team togetherness, and above all what it means to be a scientist.

Researchers came every day to teach us about their own field and about the laboratory techniques associated with their work. Neither my partner nor I had any prior knowledge of how to perform any of the procedures, but the scientists were both patient and encouraging. We learned to stain mammary glands, cut them for parts, and even dissect. Although I was terrified and a little nauseated by animal dissection at first (the mice had ten mammary glands), the process taught me the diligence that a researcher must put into their results. The procedures they perform on a daily basis require patience and focus, and the results the researchers acquire are proof of those qualities. In fact, staining alone takes almost an hour of switching the slides into different solutions. As one of the researchers told me, "we expect failure in experiments, and success is just luck." The scientists live a life of uncertainty aided by knowing that the work they perform matters.

Isabelle and I also learned how to extract data on the effect of endocrine disruptors like BPA on fetal mammary gland development. Using a program on the computer that measures images from the microscope, we learned how to measure ductal growth, one of the parameters that the laboratory reported as being altered in the mammary glands of mice that were exposed *in utero* to BPA. We were astounded that the chemical was even on the market. With a visible eye, anyone can witness that the glands develop differently in animals that were exposed *in utero* to BPA compared to vehicle.. We also saw the inverted u-shaped curve that the FDA so often ignores- the highest and lowest doses sometimes create little effect but the concentrations in the middle produce the real damage. Unfortunately, the FDA believes that only the highest doses make a difference, which is one of the reasons they are so hesitant on banning the chemical. The researchers even then helped us analyze and graph the data, which we presented to them on the last day.

Since they worked so well together like a team, the scientists at the Soto Sonnenschein lab thoroughly impressed me with their comradery. In fact, they all had lunch with each other every day, and invited us to sit with them as well. During Nicole's last week at the lab, Carlos and Ana threw her a party in their own apartment building to send her off, which they so kindly invited us to. Also, on Tuesdays everyone ate lunch in the conference room and spoke of their individual problems with their research, and others chimed in to assist in any way possible. That was the atmosphere of the lab- anyone's problem was everyone's problem. For us too, no question was too stupid or difficult. We were invited into every conversation; they even gave us their favorite travel spots to visit in Boston. Overall, perhaps the kindness of everyone at the lab is what stayed with me most.

Coming home, I wanted to apply all that I learned at the Tufts Medical Center from the amazing scientists to educate the people in my community. After a week, I threw all my plastic lunch containers in the garbage and bought glass pyrex. I told everyone I knew, mentioned it to anyone who would listen. Soon women I had never talked to in my temple approached me to ask about what they could do to prevent contact with endocrine disruptors. I convinced my mother's friends to bring it up in conversation whenever possible, as I knew word of mouth could be a quick way to give the information to all. In fact, Isabelle and I even made a cheat sheet that simplified the way anyone could implement simple changes and restrict their contact with endocrine disruptors. And we plan to continue talking and spreading the knowledge. From staying away from thermal receipts to keeping plastic away from dishwashers, we are stopping endocrine disruptors from one change at a time.

I want to say a special thank you to the Great Neck Breast Cancer Coalition for providing me with such an amazing opportunity. This program allowed me to have an experience most people never get in their lifetimes, let alone at 16. If you are thinking about applying to this amazing program, do it. As someone who finished with it, I can say that it is an eye opening, extraordinary, once in a lifetime experience.