

Ophir Sabah
North Shore Hebrew Academy High School
Great Neck Breast Cancer Coalition Student Research Internship
Tufts University, Soto/Sonnenschein Lab

Breast Cancer Coalition Essay

This summer I had the honor of working under the supervision of the researchers at the Soto/Sonnenschein Lab. Having the opportunity to dorm in a college campus opened my eyes to the future ahead of me. Not only was working under amazing, insightful supervisors, but it was unforgettable. This summer I was able to ask questions on things I was oblivious to before attending this program. In addition, every researcher explained to us what questions they were trying to answer and how they hoped their own individual projects could provide them with that. For example, one of the researchers was working on a project in hopes of answering why some women get breast cancer and some don't. His projects entailed the study of two strains of mice, Copenhagen (cop) mice, who don't develop tumors, and WF mice who are extremely susceptible to tumors. Why do some mice develop breast cancer while others don't, even when their genetic makeup is similar?

The Soto/ Sonnenschein lab proposes an alternative to the widely accepted theory, the Somatic Mutation Theory. This theory proposes that cancer arises due to mutations on the genome. The Soto lab proposes The Tissue Organization Field Theory (TOFT), which argues that cancer arises due to the disruption in communication between the epithelium and the surrounding stroma of a tissue. I was able to propose my own theory's and actually talk to the heads of the lab, Ana Soto and Carlos Sonnenschein who interestingly enough were one of the many scientists who coined the term, "Endocrine Disruptor". One of my favorite parts of this experience was sitting down with Ana and Carlos and having them explain to my lab partner and me how important we are. Contrary to what many people tell us, millennia's are the future and we hold the key to what is to come.

During this time, I was lucky enough to have a lab partner that was as devoted as I was to absorbing new information. Haley Klein was not only my lab partner but my roommate as well. I got to experience college life on Tufts University's amazing campus. Haley and I took advantage of Boston's beautiful sites and got to discover a place we have never had the chance to. We went on a cruise around Boston harbor, we went to Quincy Market, we even went to Boston Common where we had a picnic and saw an amazing performance of Romeo and Juliette.

Upon arrival, the lab seemed a little intimidating. I couldn't help but wonder what every equipment and chemical was used for and how much of it we would be able to use. Getting around seemed like a maze, I was worried I wouldn't remember how to get around but Nafis, one of the grad students, assured me that in a day I would get the hang of it. Though Haley and I did mess up on a few of our experiments we aided each other and pointed out if the other may have been making an error. Everyone at the lab was very patient with us and always reminded us that even the greatest researchers make mistakes.

The lectures given to us at the lab gave me a better understanding of the world around me. We learned about Carcinogens and how we may be unaware of how surrounded we are by them. I learned about how estrogen at certain doses promotes cell proliferation (cell growth). One of the most well known synthetic estrogen is Bisphenol-A (BPA). It's nearly impossible to avoid BPA as it is found in our daily products. Exposure to such Estrogenic chemicals during the time where our organs develop, increase the risk for Breast Cancer/ Prostate Cancer. Ever since BPA was introduced to us the incidence of diseases and disorders have been on the rise. This includes, early puberty, obesity, hyperactivity, and reduced sperm count. Science has yet to find a harmless dose of BPA which is why many labs all over the world, including the Soto lab, are fighting the industry to ban BPA in all commercial products.

I was able to observe how estrogenic chemicals such as BPA can affect behavior through the Microbiome Animal Behavior Analysis experiment. Being lectured on how BPA can affect behavior is one thing, but being able to apply it to a real life setting made it so much more real. Haley and I got the opportunity to partake in such an amazing experiment. We worked with over 50 mice, male and female, calculating each individual's locomotion. We wrote down our data and only after we were done we got to analyze the results. The males that were exposed to estrogenic chemicals were more hyper active than the males who were not exposed. Those injected with estrogen took on female like characteristics such as hyperactivity and investigation.

I've only recently realized that Biology is very complicated and rigorous. Everything takes years to prove as science relies on evidence; something the industry doesn't. The industry tricks its consumers knowing that it may take a long time till science is able to disprove one of their claims. I only got a taste of what researchers do everyday and how much work they put into their projects. A researcher is someone who devotes their life to thinking and I am so grateful to have met such great "thinkers".

I would like to thank the Breast Cancer Coalition for giving me the opportunity of a lifetime. I also want to thank everyone at the Soto/ Sonnenschein Lab for working with me and taking time out of their day to teach me things I may have never been aware of. My time at the lab was truly amazing and eye opening. I will forever carry the things I have learned during my experience with me. My lab partner said something that I believe sums up the purpose of this internship. She said she is glad to know that she is entering a world that is safer than the one she is leaving behind. I learned that the power of information can determine the future of our generation. I hope I can spread all that I have learned this summer to many more with the hope they do the same.