

Kaeli Groenert

Soto/Sonnenschein Laboratory at Tufts University Medical Center

GNBCC Summer Internship 2013

The summer of 2013 came with a once in a lifetime experience for me. When I thought about what the summer held for me I assumed that it would involve me surrounded by the screaming children of the camps I had worked in summers prior. Fortunately for me, fate gave me an opportunity most high school students never get. Working in a real laboratory, something any science enthusiast like me dreamed of. The Great Neck Breast Cancer Coalition gave my partner Christine and me the chance of a lifetime to discover what it meant working in a lab and to learn about environmental links to breast cancer.

When Cheryl sat us down and began talking about what the Soto/ Sonnenschein lab worked on specifically and its background, I'll admit to being slightly overwhelmed with a majority of what she said initially going over my head. The one thing that stuck with me though was the idea that mutations do not cause cancer. *Thanks for nothing biology class.*

After reading dozens of papers over the course of several days upon different theories on cancer formation, one being the Somatic Mutation Theory (SMT) which states that cancer is derived from one cell that accumulated several DNA mutations and that cells must be stimulated to proliferate and the other theory being the Tissue Organization Field Theory (TOFT) stated that cancer is a tissue based disease and that proliferation is the default state of all cells, I began to realize the amount of dissent in the scientific community.

Still, that wasn't all I learned. Each of the members of the lab gave Christine and me crash courses in their fields of expertise. We learned about the structure of both ovaries and mammary glands. With our new knowledge of mammary glands, Christine and I were able to analyze how different concentrations of estradiol were able to change the growth and maturation of the glands. Our analysis was based upon comparing characteristics such as lateral duct growth, number of terminal end buds, alveolar budding and ductal length, traits that were affected by the hormonal changes. We were also shown the whole entire technique for processing tissues, watching it from removal from the body during a mouse necropsy, the embedding of the tissue in paraffin (a type of wax), sectioning the tissue into sections that were five microns thick, and staining the tissue with different types of stain. Christine and I were able to section some tumors as well as stain our own slides. We were able to do two types of staining; H&E Staining (Hematoxylin and Eosine) and ICC (Immunocytochemistry). Having no prior lab experience, something as simple as putting slides into Coplin jars with different washes and stains and micro-pipetting was very exciting.

Perhaps the most important thing I learned while working in the lab wasn't really scientific. Many people say to look to the past and learn for the future. With all that we know now about the damage BPA and other endocrine disruptors do, it is a ludicrous idea that people continue to deny the facts in front of them, that the danger of these chemicals to their health is real. This internship has showed me that it is a necessity for the scientific community to come together and come up with a safer alternative to endocrine disruptors to be used in items that are integral parts of our lives.