



Characterizing Estrogen Receptor Positive Circulating Tumor Cells in Metastatic Breast Cancer Patients
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I joined the Circulating Tumor Material Laboratory in the summer of 2015 as an Undergraduate Research Assistant. During the 2015-2016 academic year, I was awarded the Mary L. And Matthew S. Santirocco College Alumni Society Undergraduate Research Grant through the Center for Undergraduate Research and Fellowships (CURF) at the University of Pennsylvania. With this grant I planned to assess the feasibility of CellSearch-based measurement of ER on patient circulating tumor cells (CTCs) as a method for monitoring response to therapy in breast cancer patients. We expected to enroll 1-2 patients per month during the summer. However, our enrollment was extremely low, so my research focus shifted to other clinical studies.

This summer, I worked on a variety of stimulating projects including a breast cancer study in which I enumerated CTCs on the CellSearch platform from breast cancer patient blood drawn after neoadjuvant therapy and from normal donor blood spiked with breast cancer cell lines, isolated plasma and serum from pancreatic cancer patient blood for a number of ongoing clinical studies, and extracted circulating tumor DNA (ctDNA) from urine samples. In addition, I assessed the feasibility of running urine on CellSearch. While there are several publications and protocols for extracting ctDNA from urine, no established protocol exists for running urine on CellSearch. Therefore, I conducted trials of urine sample runs with different selected variables to evaluate the best way to run urine on this platform.

The principle lesson I have learned through my research this summer is that science and research do not always go as planned. Although I had a particular project in mind, we unfortunately experienced low patient enrollment on the study. However, this did not cause any set back as there were plentiful other projects to pursue in the Circulating Tumor Material Laboratory. This summer I was able to learn a variety of new techniques such as two methods of cfDNA extractions in both plasma and urine, as well as how to conduct flow cytometry analysis on human and mouse blood samples. Participating in a variety of projects in the lab contributed to both my educational and personal experience by teaching me to remain flexible, patient, and proactive in my work and attitude. I have also continued to learn the importance of translational medicine by doing work in the lab and by shadowing physicians in the clinic to see the results of clinical trials in practice.