This summer I interned at a Cognitive Neurometabolism Laboratory run by Dr. Jon Valla at Barrow Neurological Institute an affiliate of St. Joseph’s Hospital and Medical Center in Phoenix, AZ. Although this was the primary location of research for the lab, I conducted the bulk of my work at the Translational Genomics Research Institute in Phoenix. I obtained this internship because as a high school student I was accepted into a student volunteer research program and was placed in this lab, and I wanted to go back Phoenix for the summer, so I offered to come back and intern over the summer if they needed help.

This lab was embarking on a new project looking into astroglial gene expression patterns in pathways underlying glucose uptake and metabolism in Alzheimer's disease (AD) patients in two regions of interest (ROIs): the posterior cingulated gyrus and anterior hippocampus. This project had three main components: 1.) Collect brain samples, 2.) Expression profile of the astroglial, and 3.) Identify potential pathogenic cascades. My main task for the summer was to prepare the astroglial for expression profiling. I spent most of my time performing Laser Capture Microdissection (LCM), on astroglial from frozen sections from the ROIs. I stained the cells using rapid immunohistochemistry, then searched for the cells with a microscope, and once found, retrieved using the laser.

After I performed LCM on all of the samples, my next task was to perform double-round amplification labeling of RNA from these samples. Then I converted the RNA to double-stranded cDNA; purified the cDNA; performed cDNA synthesis again; purified the cDNA again; and made biotin-labeled cRNA. Although my favorite part was performing LCM, this last part was the most fulfilling because there had to be at least a certain amount of cRNA for the chipping process, and if I had this amount, it meant that I had performed everything to satisfaction.

During high school, I had spend most of my time in the lab performing the same tasks (mitochondrial isolation, cell culture, running assays and cleaning glassware), and although I still performed many of these tasks, it was nice to come back and be doing something different. I was also able to teach the newer members of lab how to perform these other tasks. I learned that as one becomes more experienced and takes more of the corresponding coursework, then one’s tasks in the lab grow and adapt to correspond. I was always interested in going into science research, and if anything this just cemented it. Since I had a lot of experience in the lab from high school, I was fairly certain that I want to pursue research as a career path, but this internship made me more convinced that I want to do research in neuroscience.