Synaptic Plasticity in the Amygdala Following Traumatic Brain Injury
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This summer, I had the opportunity to conduct research in a field I am very interested in – neuroscience. I worked in the lab of Dr. Akiva Cohen in the Abramson Research Center. The project focused on the effects of traumatic brain injury, specifically to the amygdala in mice, and to determine to what extent a branched chain amino acid (BCAA) solution could mitigate these effects.

In order to accomplish this project, half of the mice in the group I worked on were brain injured and the other half were controls called shams. The sham group received both the surgery and anesthesia, just not the brain injury. I prepared brain slices from both the sham and brain injured animals, preserving the slices containing the amygdala region. Once this was done, I recorded the network synaptic activity in each slice with an electrode while superfusing the slices with artificial cerebrospinal fluid (aCSF), then bath applied aCSF containing BCAAs, and finally recorded the network synaptic activity again. It has been shown that there is decreased activity in slices from injured mice, and that BCAAs can help to restore this activity.

Through this research experience, I learned much more about both the topic of my project itself and, in a broader sense, how research projects are conducted. As I mentioned above, I find neuroscience very interesting, so to be able to learn more about the brain in a hands on-project was fascinating. Being able to actually see the brain slices and the recordings allowed for an educational experience a textbook simply cannot provide. I also was able to learn about how a research project is conducted from start to finish, and gained an appreciation for the time, effort, and patience that go into this process.

Influenced by the positive experience I had this summer, I plan on continuing this project throughout the school year and pursuing something involving neuroscience in my future career.