Reflection Fall Semester-CCHMC Research

Over fall semester I continued conducting research at Cincinnati Children’s Hospital Medical Center in the Reproductive Sciences Department in Dr. Tony DeFalco’s Lab, working with Dr. Sarah Potter. I worked in this lab during the summer and I have enjoyed working with everyone in the lab! My research question during the summer was of how do immune cells contribute to infertility in male mice? Specifically, I was looking at the role of macrophages within the Sertoli cell (which is found in the testes) and during fall semester I was trying to determine the defects in the Sertoli cells present in two mouse models. My responsibilities definitely changed from summer into fall semester because during the summer, I was mainly learning the techniques and how to use microscopes and during the fall I was given the opportunity to run a lot of experiments on my own. I believe that this semester I was really able to confidently perform tests and know that they would turn out correctly. I really liked having this responsibility in a laboratory setting because it was a new experience for me to have. As someone who would like to work in a laboratory setting, I thought this was a good indication of what to expect in the future.

Fall semester I learned a valuable lesson about research and that is that it takes time! I say this meaning that I understand that as a researcher, one has to have patience because not every test or technique will turn out smoothly and there is the possibility that something will have to be repeated. During this semester I had trouble with genotyping the mice in my mouse colony. I was in charge of two mouse colonies, the two used in my research are Dhhcre, cdc42 fl/fl and Dhhcre, rac1 fl/fl. This two lines are used to examine the Sertoli cell, in particular the blood testis barrier which is not formed in mutant mouse lines. For each new litter of pups born, one has to genotype them to see if they carry the gene (fl/+) or if the gene will be turned off (fl/fl). In order to see what genotype a pup has the tails have to be clipped and digested before PCR amplification or a Gel can be run on the samples. In the summer I ran multiple PCRs and Gels with no problem, but for some reason fall semester I had the most difficulty. I would go down to the mouse room, cut tails, digest them, run them through PCR amplification, and then run the samples through Gel and for some reason the samples were not showing up on the gel. I would re-run the samples again through PCR and gel, thinking that maybe the PCR did not work and every time the samples would not show up on the gel. I learned to be patient during this experience because running PCR and gels had been one of the first things I had learned how to do and at this point I thought that I had this technique down. However, due to having this problem it allowed me to brainstorm and think about what the issue could be that is causing the samples to not show up on the gel. I talked with everyone in the lab to see what they thought the issue could be and it allowed for me to ask more questions about a technique that I previously thought I knew everything about, but I learned that there are a lot of variables involved that would cause it to not run properly. Finally after about a month or so, we all figured out that it was the reagents used to digest the tails and the reagents used for the PCR amplification. Once that was figured out I was able to genotype the tails again with no issue, but now I was behind in my original plan for research for the semester. This meant that I would not be able to present at the end of the semester at a departmental seminar. This particular experience during the semester really allowed for me to take a step back and really look at the techniques that I was learning and to understand that sometime those techniques may not work every time and that is okay.

Even though I had difficulties with the PCR and Gel, it did not stop me from using immunofluorescence to examine the control and mutant testes under the microscope and take pictures. By using immunofluorescence I was able to stain particular areas within the cell using antibodies, so when looking under the microscope the antibodies allowed for those areas to fluoresce. I was able to look at the Sertoli cells and to see the differences between the control and mutant mouse testes. It was really nice to be able to see from start to finish everything that I had been working on in the summer to the fall. I had the responsibility of handling the mouse colonies, dissecting out the testes, and using fluorescence to examine particular areas and to note differences between the control and mutant mice.

I believe that in this experience it helped me grow both academically and personally. Academically I was able to excel in my classes and receive the highest GPA that I have gotten in college thus far. I have to attribute some of that to the knowledge that I have gained while working in the lab because some of the techniques that I have learned were taught in my Microbiology class that I took this semester. I have grown personally from my research experience because I have been able to see a difference in how I manage my time and I have reduced my tendency to procrastinate. I believe that this experience has taught me the importance of managing my time because in research one does not have the opportunity to procrastinate, especially when experiments have to be in certain time constraints. I have really enjoyed my experience and I have learned so much from both Dr. DeFalco and Dr. Potter. I am grateful for the knowledge that I have received and I hope to apply it even more in the future.