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UHP Biomedical Research and Mentoring Program

Reflective Essay

This past semester I had the good fortune to participate in the UHP Biomedical Research and Mentoring Program for the second year in a row. The UHP Biomedical Research and Mentoring Program pairs undergraduate students, mostly first and second years, with researchers either at Cincinnati Children's or at UC College of Medicine. This year I worked under Dr. Andrew Rosendale in the Benoit Lab at the University of Cincinnati. My research focused on the physiological responses of tick under stress. Specifically I looked at their responses under cold shock and dehydration. I used various biochemical assays to measure the metabolite content of the ticks after they were placed under stress. The metabolites I was interested in were carbohydrates, lipids and proteins. This experience was both what I expected it to be and completely different than what I expected it to be. I figured I would get involved in several projects in a small fashion. I also figured that I would learn a whole bunch of stuff very quickly and be expected to retain all of the knowledge quickly. Lastly I figured I would be watched by someone most of the time I was in the lab. Well what I ended up doing was the essence of this. I did get involved in multiple projects but there were only two overarching projects and I spent the majority of my time on one project. I did learn a bunch of new things; however, they were broken up in such a way that I was learning about one new technique a week. Instead of everything being thrown at me and expected to stick, everything was nicely compartmentalized so I was slowly building my knowledge over the course of the semester. The most bizarre and significant thing about this experience was how independent I was able to become by the end of the semester. I do have some previous lab experience but that experience was in a different field of research so a lot of what I learned in that experience doesn’t always transfer over to this experience. There is one example of my independence that I to this day still find amazing. Andrew was not going to be in that day; however, I had some work that needed to be done. Instead of having me wait until he could be in, Andrew made sure I knew what I was doing and allowed me to perform the difficult procedure completely on my own.

Over the course of this experience I believe that I have significant progress toward some of the learning objectives I identified in my proposal. I especially believe I made great progress toward the **Possess a well-developed awareness of literature in the field** learning objective. Just as in all lab work the start of this experience for me was to read a lot of papers. I really do mean a lot of papers. When Andrew and I first matched for the program, I was sent 4 papers to read that would help give me a foundation in the theory that my research was going to be based in. I showed up to the lab the first week of school with 2 of these papers read and plans to read the last 2 during the first week of classes. Little did I know I would receive another 10 papers to read. After reading all of these papers I noticed that I was both understanding and retaining more of what I read. I also think I made significant progress toward the **Ability to identify and apply appropriate methodologies to design research study, and collect and analyze data** learning objective. Many of the procedures I ended up performing in the lab I first read about in one of the numerous papers I read for this experience. When I read the papers I was on the lookout for these procedures and marked them for future use in the lab. In addition to the procedures I ended up performing I also noticed that you could apply a number of other methods to obtain the same values. We chose to use the methods we did simply because we knew they would work on our study animals and would be relatively easy to perform. The only learning objective I did not make significant progress towards was the **Formulate a theory, problem, or hypothesis for the proposed research project that is based on the literature review** learning objective. This wasn’t due to any fault of my own just due to the period in which I entered the lab. By the time I started to work in the lab, we objective of the research had already been decided. I hope to have a chance to work on this learning objective in the future as I was not able to make any progress towards it now.

Through out this experience I relied heavily on the all of the papers that were sent to me when I first started this experience. Within those 12 or so papers I could find every procedure that I would come to perform in the lab. Most of these papers Andrew sent to me for that reason. Every procedure that I would do in the lab I would have a paper that detailed the procedure. From the foundation the paper gave me I could go forth and search the internet for anything I didn’t understand or anything I wanted extra clarification on. Some of my existing lab skills were of great use in this lab. Of course not everything I learned last year was applicable to this research project, but I found more often than not I could always fall back onto my bank of basic lab skills. From last year I knew that a lot of this was going to go over my head at first. I prepared for that by asking the same question time after time until I was finally able to piece all of the parts together. I also relied heavily on Andrew to point me in the right direction when I first started and to this day I still rely on him just less and less each day.

Over the course of this semester I re-discovered just how stubborn I am. I pretty much approach all the problems I face in life in the same fashion: I run straight into them until one of us brakes into several pieces. Problems in the lab are no different. When something would go wrong I would quietly obsess about the problem until I fixed. Research helps me wrangle my stubbornness a little bit. Science really goes right time. After the course of the semester I stared to get less and less freaked out when an experiment wouldn’t work right in the first time. I started to become more patient with the science as the semester progressed. In addition to the technical skills I learned this semester the greatest asset I will take from this experience will be the increased patience. Since I have previous research experience, I came into this experience with a certain set of skills. Perhaps the most surprising thing to me is the increased confidence in myself and my abilities I gained from this experience. Towards the end of the project I was doing a lot of basic techniques I learned last year and I was performing them better and more accurately than I had ever before.

After completing this experience I may need to revisit my strict no research stance. My lab experience last Spring wasn’t exceedingly positive so I had just about given up on research. I thought I would do a little more of it has an undergraduate since Medical schools like to see that and I did enjoy what I did last Spring a little bit. I took my reservations quite seriously when applying to projects this go around. I only applied to two projects and only interviewed with one. This time I wanted be certain that the lab I picked would be a good fit for me and it was. I really enjoy what I do in the lab now. I still don’t want to go into a MD/PhD program but I think I may like doing research as a small part of my clinical career.

As it always seems to go for me I learned so much more about myself through this experience than I thought I would going into the experience. I learned to be more patient and to cut myself a brake more often. I don’t need to master everything I do on the first try and it is more than OK to ask for help if you need it. These may seem like simple statements but sometimes I struggle with acknowledging that I am not and nor do I need to be Superwomen. I can ask for help and no one will think less of me for asking. In fact I noticed that asking more questions tended to increase my understanding of the topic. I also learned that I enjoy the daily grind of lab work. It is amazingly relaxing to just be in the lab working on some science in total silence or just with the sound of your music. I was surprised by the number of comparisons I was able to draw between my lab work and my Biology class this semester. A couple of the procedures I did in lab I also ended up doing in my Biology lab and many of the concepts discussed in lecture were related to the material I was studying in the lab.

I have already shared what I learned in this experience at the Final Presentations and Reception that UHP hosted for this program. This reception was attended by every researcher in the program as well as honors advisors and several of the mentors who were able to attend. This final presentation focused heavily on what I learned about myself and the research process as a whole instead of the cold, hard science of what I was doing. In addition to this presentation, I plan on continuing to serve as a RECON mentor to share more of the hard science of what I did with other undergraduates who are interested in getting involved with undergraduate research. By sharing what I learned at the reception I gained a new found appreciation for all of the research that everyone in the program did this semester. Personally I gained an appreciation for Andrew . Last year when I was listening to everyone talking about how amazing their experience was, I was really jealous as I didn’t get the amazing experience I wanted. This year I got that experience. I had an amazing semester and I am really looking forward to seeing what I will have the chance to do this summer. Hands down the best part of this experience is going to be participating in SURF and getting to experience what full time research looks like and getting to continue in a lab that I thoroughly enjoy working in.