

2017 Undergraduate Research & Creative Activity (URECA)

Project Final Report

Within one month of project completion and no later than July 15, 2017, please provide an informative but concise (1-2pp) report that addresses the questions/items below. Please submit reports, along with any project photos that you approve of being distributed or publicized, to both kmjensen@alaska.edu and bbuma@alaska.edu.

Your Name: Cole Deal

Your Faculty Mentor: Dr. Sherry Tamone

(1) What was the original project objective or purpose?

Laboratory studies have been very important in understanding the physiology of commercially important crustaceans although removing crabs from their natural habitat can remove the crab from natural biological cues such as photoperiod, tidal cycles, and habitat. By assaying for circulating ecdysteroids in hemolymph of Dungeness crab, we can better understand how artificial settings are affecting the physiology of these crustaceans, in turn how they determine the outcome of laboratory studies by monitoring these differences between environments. The main goal of this project will be to determine whether there is a clear and present difference in ecdysteroid concentration between Tanner crab that have been exposed to lunar cycles; meaning they have tidal, temperature, depth and photoperiod influences, compared to lab setting Tanner crab, which will not have these external influences acting upon them.

(2) With respect to your proposed project activities, what have you achieved thus far?

Within the goals of my project, I completed a 2-month study of Dungeness crab in both artificial and natural settings, having assayed every Dungeness hemolymph sample for ecdysteroids, except 4 or 5 samples due to time constraints in the lab. I am in the process of analyzing the data acquired that was not presented at the URECA symposium. Dr. Sherry Tamone will continue to sample Dungeness crab that were transferred from outdoor pots to the indoor tanks to determine if significant physiological change will occur when transferred from the natural to artificial setting.

(3) Please explain any departures from your original project objectives, proposed activities, and/or notable budget changes.

Due to permitting issues, we were unable to acquire Tanner crab for this study, so Dr. Tamone dove for Dungeness crab, which we changed our research objective to focus around these crustaceans instead of Tanner crab. Experimental design wasn't changed in the process; however, we became less confident in the hypothesis due to not working with terminally molted crustaceans that still display circulating ecdysteroids in their hemolymph. This change meant that we were dealing with molting animals, therefore we weren't sure how are results would be affected because of this. There weren't any budget changes, and ended up spending less money than received.

(4) What is the current status of your project? If not complete, when do you anticipate completing it? Do you plan to spend any more of the remaining funding?

The project is mainly complete, except for a few samples that need to be run, which should be assayed for this summer in Dr. Tamones lab. Dr. Tamone spent the last money on some lab supplies, the leftover will be returned to the URECA committee.

(5) Please summarize the project outcomes and/or any tangible products that resulted (or will result) from the project.

We can say with some confidence that ecdysteroids circulating in crab exposed in a natural environment are statistically different than crabs kept in an artificial environment, showing changes different to one another when different environmental stressors are acting upon the crabs. We now have baseline data that shows that there is a difference in physiological expression when an organism is taken out of the lab and placed in a laboratory setting. The next step is to analyze the results and determine if we have enough information to publish the data acquired from this project.

(6) Please communicate the personal significance of your project, such as the impacts of the project on your education and experience at UAS; impacts on your future interests and outlook; how this project influenced your relationship with a faculty member; or simply use this space to provide some perspective about research & creative activities for students at UAS.

I consider the opportunity to participate in this research project as the highlight of my undergraduate career so far. This opened my eyes to see what goes into writing a research proposal, setting up an experimental design, learning laboratory techniques, analyzing results, and presenting it to an audience. It has taken all my skills as an undergraduate; such as critical thinking, self-reliance, laboratory skills, the humility to admit I'm wrong, learning from my mistakes, and trying until I get it right.

Working in the lab of a successful, published professor was very humbling and a great privilege. Dr. Tamone provided exceptional guidance, while at the same time leaving the project in my hands to complete. Weekly meetings reading literature and discussing the status of our projects was undeniably helpful, and only aided in the success of this project.

I strongly encourage any UAS student to take part in an undergraduate project in the college career. While research is a very time consuming process, I advise students to only attempt this if they are committed and passionate about their research objective, because science without passion can turn into a nonconstructive process that will be displayed in the results of the study. So, for future students, find a research topic of interest, find a professor you can easily communicate with, and set up an experimental design that follows the scientific process.