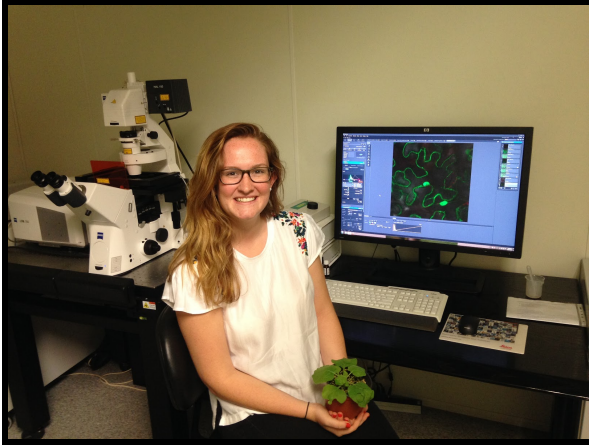


Summer Internship Report 2017

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Provide an overview of the organization/research project and a summary of your responsibilities, tasks, and/or projects.

The lab I worked in at the IMBCP is run by Dr. Lynne Yenush. Her lab focuses on investigating potassium transporter regulation in plants and yeast. My research project for the summer was an experiment examining Agrobacterium-mediated transient transformation in Arabidopsis seedlings. A majority of biotechnology plant research is conducted using the Arabidopsis plant or the tobacco plant *Nicotiana benthamiana*. Biotechnologists have harnessed bacteria mechanisms of gene transfer and use them to view expression of cloned genes of their choosing in plants through one of two methods of bacterial transformation, stable or transient transformation. Stable transformation is used to create a mutant cell line with a specific genomic insert. Transient gene expression is much faster and results are seen without spending as much time growing multiple generations of plants. Arabidopsis is the most widely studied model plant in research, however achieving highly efficient and consistent transient expression for gene function analysis in Arabidopsis remains challenging. My project for the summer was to investigate this mechanism of gene transfer in Arabidopsis and develop a protocol to successfully conduct a transient genetic transformation in Arabidopsis using Agrobacterium.

During your internship, what did you accomplish or how did you make a difference? In what ways did you grow in your professional and technical skills?

During my 8 weeks in Valencia, I was able to transform Arabidopsis successfully using my modified protocol and view fluorescence using a confocal microscope. I also was able to construct my own DNA plasmid using the GoldenBraid cloning system. As a biology student, I gained advantageous laboratory experience and techniques that I will surely use in the future. My mentor showed me the many possible paths I could take with my education and interests.

Describe a problem that you helped to solve at your internship. What skills or knowledge from your education at Sewanee helped you address the problem?

One of my experiments was infected with a fungal contamination that spread throughout my entire target population. Though my protocol had not gone according to plan, my education at Sewanee had afforded me the experience to fix a somewhat common and extremely detrimental problem in laboratory research. In one of my lab classes at Sewanee, there was a fungal contamination that skewed all the results for the entire class. While we were unable to obtain the results we expected, we all learned a valuable lesson on how to deal with a contamination of microorganisms, and that knowledge helped me salvage data from that trial during my internship research.

In what way were your teamwork skills strengthened?

In a laboratory setting, there are always different projects and investigations being conducted at the same time. During my summer internship, I was able to work alongside other students in my lab with their projects and learn so much more about their research topics along with my own. It was especially beneficial to practice other laboratory protocols and techniques that I wasn't using specifically in my project but they were using in their investigations. I also was working in conjunction with my mentor, the vice president of the department in which she works, on her personal project so I was able to learn from a very high-level teacher some valuable techniques and lessons about working with team members.

How did your internship affect your career plans?

My internship involved exactly what I planned my career to be, working in a lab conducting research on my own, and it was everything I hoped it would be. Even on my slowest days or days when my experiments didn't go as planned, I was still so excited to be in the lab working with these organisms and practicing procedures. My mentor was also able to explain the many career options I have if my plans involve this type of laboratory experience, and my education at Sewanee is also pushing me to explore these many opportunities in my chosen career field.

In what ways did your internship cause you to encounter people of different backgrounds from your own? What steps did you take to communicate effectively with such persons? What did you learn from such persons' perspectives?

While the main focus of my internship was cell biology research, one of the most important factors is that I was doing this research in Spain. I was able to use my semester-long language immersion while learning about science and my favorite topics. I spent the spring semester studying in Madrid with the Sewanee Semester in Spain group, and moved to Valencia for my internship in May. I was surrounded by Spaniards in both cities, but also many researchers from other countries that worked at the IBMCP in other labs. I met people from many countries in Europe, Asia, Africa, and others from the US. I found that though English was a very widely known language, if I was speaking with people from countries other than Spain, our most effective language to communicate with was Spanish, even if it was a second language to us both. It was very interesting to listen to their experiences working as a scientist in Europe versus other places such as the US.

Words of thanks to your internship funding donors:

I am so thankful for this wonderful opportunity to explore my passion, and it would not have been able to happen without the generosity of the donors. Thank you for helping the future generations explore the possibilities that this world has to offer and pushing Sewanee students to achieve great things.

Words of advice for future interns (housing, transportation, etc.)?

Doing an internship abroad can seem like a daunting experience, but it allows you to combine many different aspects of your interests and education into one extremely relevant project.