

This summer was my first summer interning at the University of the South under the guide of Dr. Alyssa Summers in the biology department. I took over the project of graduating senior Nicholas Klus, examining the role of HDAC3 (Histone Deacetylase Complex 3) in regulating GIMAP expression in T-cells. In previous experiments, it has been shown that the GIMAP family of proteins is up-regulated in HDAC3 knockout mice, especially GIMAPs 4, 6, 7, and 8. These proteins were the most highly up-regulated when HDAC3 was removed, suggesting that there is a relationship between the presence of HDAC3 and the expression of these proteins. HDAC3 is a protein involved in gene transcription, so we decided to do a promoter analysis to test whether or not the levels of expression of these GIMAPs change when the levels of HDAC3 are altered.

To test this, a circular piece of DNA, called a vector, must be made that contains the promoter region of these different GIMAP genes, respectively. This region is located upstream from the gene transcriptional start site that interacts with different transcription factors to control gene expression. This summer, I worked on constructing these vectors, and was able to successfully construct vectors containing the promoter regions of GIMAPs 4, 6, and 8. This may not sound like much work, but constructing each of these vectors takes upwards of 15 steps each with multiple different assays including PCR, restriction digests, gel electrophoresis, and DNA purification. In all of these steps there are plenty of places to fail and make mistakes, and boy, did I fail a lot.

Last summer, working in the lab of Dr. Emmanuel Volanakis at the Vanderbilt Ingram Cancer Center, I was lucky enough to have minimal failure. However, this summer has taught me how failure is an integral part of the scientific process, a lesson that every young scientist

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Summer 2014

should learn. You cannot always be correct, and not everything is always going to work out perfectly. In a way this lesson is just as important as knowing how to pipette or learning how to construct PCR primers.

This summer for me was more about really learning all of aspects of the scientific process than anything else. Through my failures, I did end up perfecting my lab techniques and acquiring excellent results. I look forward to continuing my research with Dr. Summers this year, and know that the skills I have learned and will continue to learn from her will be truly invaluable in whatever career path I choose. This summer at Sewanee was truly an adventure, one I would not trade for anything.