The research I took part in the past summer was conducted in Spencer Hall, within the biology department of The University of the South. We performed and studied a mouse lab, in which we explored the role of histone deacetylase (HDAC 3) in the tumorgenesis of mammary tissues within mice. The mice in our study had the genotype MMTV-cre: HDAC3 floxed allele and PMT (Polyoma Middle T). We were working to determine the incidence and latency of tumors in Wild Type (WT) verses Knock Out (KO) mice expressing the MMTV-PMT transgene. We also worked toward evaluating the incidence of tumor metastasis to the lung, and determine the role of HDAC 3 in EGFR, cMET, TGFβ, and ERK signal pathways known to be involved in tumor progression by generating tumor cell lines. We were working to show the correlation of expression of HDAC3 with EGFR expression and activation to understand the role of HDAC3 in EGFR dependent cell motility and elucidate the role or HDAC3 in EGFR signaling cross talk with c-Met.

Initially, the mice had to be genotyped using a process known as PCR, or polymerase chain reaction to amplifiy the DNA and test for the presence of the specific genes in question: HDAC 3, Cre, and PMT. We then monitored and tracked the progression of tumors within the WT and KO mice. The tumors were harvested around 2cm and used to establish a cell line that we could use for further experiments. These further experiments were scratch assays to test for cell motility and western blots to understand the signaling pathways in use. The results of these experiments were compared against humans breast cancer cell lines attained from American Tissue Culture Center, as well as health epithelial cell lines. These experiments helped show the difference in the behavior of tumor cells with HDAC 3, tumor cells without HDAC 3, and normal

cells. The culturing of the cells took place in tissue culture room and all work with cells was done under a sterile hood. Until my research began I had never worked in a biology lab. All experiments run and the culturing of the cells were new experiences for me.

The work within the lab was tedious and involving, yet was well worth the time. All experiments led to new questions or answers and created a desire to learn and do more. As in all science, some experiments worked better than others or not at all. The seven cell line I had been growing all summer got contaminated in late July from an unknown source and after three weeks of troubleshooting, the cells finally began to stay healthy again. This put a steady hold on my research until I had cells to work with again. Another issue we had was with the western blots; after my partner and I ran around twenty, they finally started to turn out correctly. All these trials helped me further understand the processes of every experiment and learn how to troubleshoot on my own.

My research at Sewanee has been the most valuable thing I have done for my career aspirations. It has given my broad goal of simply becoming a doctor a new concentrated path of becoming a pediatric oncologist. With a final goal in mind, all that I do holds more weight and makes me want to push myself harder in all that I do. I know now that I would not like to be a research scientist but I am thankful for my time in lab, for it has given me a greater understanding and respect for all that past researchers have led us to know today. I am continuing my research this semester with intentions of continuing until I graduate. Hopefully my research will give me the information I need to apply for honors as a senior and possibly be a part of a greater study that may one day be published in a molecular medical journal. I have been so grateful to have the opportunity to extend my knowledge on such an interesting a

subject as cancer with such depth and individual focus. My future in medicine will be furthered by the continued time I spend in lab conducting research.