



**Loss of Rb Promote Alternate Genetic Pathway in Lung Adenocarcinoma
JiCi (Jenny) Wang (COL 2019)
Advisor: David Feldser**

As someone who has never participated in research before, I had an eye-opening and memorable experience in the Penn Undergraduate Research Mentorship Program with Dr. David Feldser. This summer, I learned about the genetic pathways influencing the progression of lung adenocarcinoma. In particular, I focused on three genes: Rb, Nkx2-1, and Hmga2. Through reading literature on the subject, I learned that Rb is a prominent tumor suppressor in lung cancer, meaning that it controls the cell cycle by ensuring that cells divide at the appropriate pace. In its presence, Nkx2-1 and Hmga2 behave in a seesaw relationship, with Hmga2 typically associated with more malignant tumors. My project was to investigate the relationship between Nkx2-1 and Hmga2 in the absence of Rb. In doing so, I generated cell lines with either Nkx2-1 knocked down or overexpressed in Rb absent and present (control) samples. Then I ran western blots to observe how changes in Nkx2-1 in the absence of Rb affected Hmga2.

I gained much insight through this research experience. I learned integral techniques involved in basic scientific research, including culturing cells, calculating the concentration of DNA, and detecting the presence of proteins. I learned how to handle mice, which provide organic models for monitoring tumor progression. And I learned about the origins and hallmarks of cancer, particularly metastasis, which occurs when the primary tumor cells attack and flourish in other organs within the body. More importantly, I learned to become more of an independent thinker. Until now, I do not think I fully appreciated the idea and importance of “learning outside the classroom.” Although I accumulated a lot of conceptual knowledge from my courses, my research enabled me to reflect on and apply my studies. I was given the opportunity to think about how things fit together and was challenged to efficiently use the skills I had acquired in training to solve unanswered questions in science.

I have always been the type of person who liked to complete tasks effectively and quickly. Sometimes, I get so caught up in simply doing things that I do not consider how they fit into the

bigger picture. Through my research experience, I am starting to understand the value of taking a step back and asking myself, “why am I doing this?” or “what’s a better method?” I have found that in addition to finally being able to identify the correct pipette tips to use, I also make more thoughtful decisions concerning daily tasks and the trajectory of my project.

Working with Dr. Feldser gave me insight and appreciation into the value of basic science, especially the ways in which it provides a foundation for cancer treatment and medicine. It also provided me with some clarity as to how I wish to approach my educational experience at Penn and my career options beyond. I will continue working with Dr. Feldser in the fall and hope to always participate in some kind of research after graduation.