Thanks to the Summer Research Opportunity Program in Pathology (SROPP) and the funding support from the American Society for Investigative Pathology (ASIP), I was able to spend the 2017 summer working in Dr. Diane Bielenberg’s cancer biology laboratory at Boston Children’s Hospital and Harvard Medical School. Returning as a student in the Continuing Umbrella of Research Experience (CURE) program in the Dana-Farber/ Harvard Cancer Center, I was able to explore cutting-edge research with a diverse group of students and participate in laboratory bench work, seminars, discussions and journal clubs in a stimulating academic environment.

My project this summer was focused on targeting neuropilin-2 (NRP2) as a cancer therapy. NRP2 is a transmembrane receptor for vascular endothelial growth factor (VEGF) and its expression is upregulated in endothelial cells during tumor angiogenesis. NRP2 is also expressed in tumor cells and stimulates migration. We hypothesized that inhibiting NRP2 in tumor-associated endothelial cells or in tumor cells may reduce tumor growth and metastasis. Previous experiments have shown that silencing NRP2 in tumor cells (in vitro) followed by injection in vivo in mice resulted in significantly smaller tumor size. However, the vascular dependence on Nrp2 in tumors is untested.

I specifically examined this vascular dependence by comparing bladder tumor growth in wild-type and Nrp2-deficient mice. Luciferase-labeled mouse bladder cancer cells were injected orthotopically into syngeneic wild-type mice (Nrp2+/+ [n=5]) and Nrp2 knockout mice (Nrp2−/− [n=5]). Tumor growth was followed using bioluminescence imaging for 3 weeks. At the end of the experiment, mice were euthanized and necropsied. Tumor weights were compared between the groups. The average tumor weight was less in the Nrp2-lacking mice compared to wild-type mice but the data did not reach statistical significance. We plan to repeat these studies using a larger cohort size and hope to present our findings at the ASIP 2018 Annual Meeting at Experimental Biology in April 2018.

Besides gaining practical experience in a translational science laboratory, I also increased my knowledge in the areas of cell biology, cancer biology, and histology this summer. The exposure to numerous medical doctors and graduate students through CURE programming and the laboratory experience where I interacted with other undergraduates, master students and research fellows helped me to understand more about a career in the biomedical sciences and strengthened my dedication to this path. Furthermore, I have been blessed with the invaluable mentorship of Dr. Bielenberg, who continues to guide me in my career development. Thanks to the ASIP and the SROPP for this extensive and beneficial opportunity.