Analysis of clinical signs and blood markers for ankylosing spondilitis in rats

During the summer of 2006, I worked in a rheumatology lab where the focus is on ankylosing spondylitis, a form of arthritis. Prior research has confirmed a relationship between the tissue type HLA-B27 and the occurrence of spondylitis as well as its related symptoms such as intestinal problems. Researchers have hypothesized that a specific antibody in the HLA-B27 tissue binds with specific receptors, causing the arthritis. Therefore, by using several different antibodies and modifying them so that they cannot bind with these receptors, Dr. Taurog hopes to identify the specific antibody involved. The discovery of the specific antibody may lead to the development of gene therapies that may prevent or help manage the disease.

During the time I spent working in the lab, I served as an assistant for two researchers in the lab. Although I was not conducting my own experiments, they trusted me with a tremendous amount of work and provided me with hands-on experience. My responsibilities consisted of checking on the rats, preparing blood work, and organizing data. I was responsible for “scoring” the rats in the lab, a process in which the rats’ paws, hind legs, and tails are checked for signs of arthritis. This process allows the researchers keep track of the frequencies of the occurrence of arthritis amongst the different lines of rats with genetically different tissue types.

The bulk of my work consisted of collecting blood from the rats, preparing it for analysis, and then managing the data collected. Separated blood cells were washed and tagged with antibodies and fluorescent dyes. I then ran the cells through the FACS machine, which counts the number of cells displays them on a computer screen in different locations on the graph. The cell’s location on the graph depends on whether or not the antibody was able to bind to the cells; the antibody could not bind at all, bind on only a couple of cells, or bind on the majority of cells present. By using this FACS machine, we are able to determine the variance of the type of cells present in a certain line of rats. Once all the results were collected, I organized the data into tables displaying the various outcomes of each individual rat’s cells. The rats can then be gene typed as either homozygous, heterozygous, or a knockout. Finally, depending what is needed, certain rats are selected for further research or for breeding.

I am extremely fortunate to have been able to work in Dr. Taurog’s lab. The team members were more than willing to take the time and effort to teach me the procedures, as well as the underlying concepts of the research project. Furthermore, I was allowed to take an active role. Most importantly, I felt that I was appreciated as an assistant. I was able to apply my knowledge of biology to the work that I was doing, and I gained a level of comfort and confidence working in the lab. As a result, I will be able to apply the skills I developed to other laboratory experiences in the future.