During the summer of 2005, all my research focused on characterizing the
genetics and immunological properties of disease in a strain of mouse that spontaneously
develops arthritis, a strain I’ve called AR-SJL. I accomplished 3 key research goals: 1.)
Compilation and analysis of over 2 years of inheritance data using an online SQL
database developed in collaboration with Prof. Wayne Iba, 2.) Quantitation of the serum
immunoglobulin levels in arthritic and non-arthritic littermates and assessment of their
functional significance through adoptive transfer experiments, and 3.) Initial
characterization of the joint pathology through standard hematoxylin and eosin staining
techniques. Much of this data I was able to present in a poster at a national conference,
the FASEB Summer Research Conference on Autoimmunity in Saxon’s River, Vermont
in mid-June (Copy of poster attached). The poster was well received and ended up
winning a monetary award at the end of the conference.

Helping me in these efforts were 2 students that I supervised for 10 weeks each.
Joel Wilcox focused on the animal husbandry and breeding, organizing an extensive
mouse pedigree that verified the findings from the online SQL database, harvesting
serum from AR and non-AR mice to complete a large collection for immunoglobulin
screening, optimizing the ELISA technique to measure the serum immunoglobulin levels
in over 35 mice (He completed 4 large experimental runs), and starting the initial serum
adoptive transfer experiments. He also started efforts to genotype a B and T cell-
deficient strain I had. Although these efforts were unfruitful, he did gain experience in
DNA isolation, PCR, and gel electrophoresis. My other student, Heather Parrish, was in
charge of weekly disease scoring of over 100 mice in my colony and collecting organs
and joints for pathological analysis. She also started optimizing 2 challenging
experimental protocols never done at Westmont before. In the first, she attempted to
quantitate immunoglobulin-secreting B cells in the spleens of AR and non-AR mice using
ELISPOT. In the second, she learned to cut frozen sections of mouse organs on the
newly purchased cryostat and then attempted to stain for different immunoglobulins
using florescence microscopy. Both students were very competent but new to
immunological research so much time was spent training them and helping them trouble-
shoot protocols that did not work. In the end, both obtained enough data to present their
own posters on the Westmont Summer Research Symposium in September. Joel also
gave a 10-minute oral presentation.

In addition to the laboratory research, I completed writing an invited review
article on the role of dendritic cells in central nervous system disease (Manuscript
attached). While the work was in collaboration with colleagues at Northwestern
University, I was the primary writer and am listed as first author. Submitted to
Neurochemistry International, the manuscript summarizes all the published data on the
importance of an immuno-regulatory cell type that has been of little focus within the CNS
itself but which might be the key cell type driving disease progression. We focused on
much of our own work that was published last year in Nature Medicine and additional
manuscripts that will be submitted over the next few months.