

Summary:

The immune system has the ability to recognize an almost infinite number of antigens, thus protecting us against infections by a wide variety of pathogens. However, a price of this diversity is autoreactivity. Although tolerance mechanisms normally keep autoreactive B and T cells in check, failure of these processes can lead to the development of autoimmune diseases. Many different tissues can be attacked by the immune system in these diseases, including the joints, the kidneys, and the central nervous system, leading to significant morbidity and mortality. On the other hand, an understanding of tolerance has been exploited as a general approach to the treatment of cancer. Through a mixture of lectures, case studies, journal clubs, team based learning activities, and hands on experiences, this course will explore the molecular and cellular basis for autoimmune diseases and cancer immunotherapy. Pathogenic mechanisms, susceptibility factors, diagnostic approaches, and therapeutic strategies will be discussed.

Learning Objectives:

1. Students will classify autoimmune diseases according to their pathogenic mechanisms using rheumatoid arthritis, systemic lupus erythematosus, and neuro-immunological disorders as examples.
2. Students will describe the risk factors for development of autoimmunity including gender, age, genomics, and the environment.
3. Students will explain how laboratory testing can be used in a rational, evidence-based manner to aid in the diagnosis of autoimmune disease.
4. Students will be able to use their understanding of autoimmune disease pathology to predict the beneficial and adverse effects of different therapeutic strategies.
5. Students will illustrate how autoimmunity can be exploited for 'boosting' the immune system therapeutically and understand immune related adverse events from checkpoint inhibitor therapy for cancer.