Markey Module, Immunotherapy

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The immune system is a network of cells and molecules that work in concert to defend the host from infection and malignancy. Over activation of the immune system leads autoimmune disease and immune dysregulation, which results from immune-mediated damage to normal tissues and organs. The development of malignancy requires that cancerous cells evade immune surveillance, providing a mechanism to treat cancer via anti-tumor immunity. Immunotherapy broadly refers to harnessing or limiting immune responses to treat human disease. In this module, the basic constituents and mechanics of the immune response will be introduced. Dr. Fehniger will discuss the use of natural killer cells as a cell-based therapy for leukemia. Drs. Carreno and Linette will discuss cancer vaccines, new approaches to generate personal or precision vaccines for individual melanoma patients, and the use of checkpoint inhibitors to augment anti-tumor immunity. Dr. Romee will discuss the mechanisms underlying allogeneic hematopoietic stem cell transplantation, and how this first cellular immunotherapy has been successful in treating blood cancer. Dr. DiPersio will discuss a new class of agents engineered to simultaneously target cancerous cells and activate the immune system. Our invited lecturer, Dr. Davila will provide an overview of chimeric antigen receptor modified T cells used to treat lymphoid malignancies, and how this revolutionary therapy has encountered speed bumps to become commercially available. Dr. Cooper will discuss mechanisms whereby the immune system attacks the host, and rational approaches to limit inappropriate immunity. Several patient interviews will provide firsthand insight into how immunotherapy affects the lives of cancer and autoimmune disease patients. A field trip will “follow the pathway” of immune cells from a donor, to the biological therapy core, cryopreservation lab, and finally to the cell therapy/BMT hospital unit providing a snapshot of immunotherapy in clinical practice.