CANCER VACCINES AND TUMOR IMMUNITY

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The field of cancer vaccines is currently in an active state of both preclinical and clinical investigation. Hypothesis-driven preclinical studies in both in vivo rodent models and employing in vitro human systems are readily being translated into science-driven clinical trials. The basic concept in the use of vaccines for cancer therapy is to define strategies in which the immune system recognizes tumor-associated antigens that are not otherwise being recognized in the tumor-bearing host. There are numerous components of the immune system that vaccines have been shown to activate. These include cytolytic CD8 T cells, helper CD4 T cells, antibodies, natural killer (NK) cells, and other components of the innate immune system. Indeed, recent (as of 2007) studies are demonstrating a more intimate association than had been previously thought between the innate and the adaptive immune systems in cancer immunity. Equally important are the findings that a range of suppressor cells, such as regulatory T cells, immature macrophages, and other immunosuppressive entities and signals must be dealt with for the effective generation of an immune response and antitumor immunity. Both classical chemotherapeutic drugs, such as cyclophosphamide, and monoclonal antibodies directed against immune suppressive elements such as CTLA4 (cytotoxic T lymphocyte antigen 4), are examples of strategies that are actively being investigated.

A major aspect of this book is the elucidation of the wide breadth of vaccine vehicles and strategies that are being employed to enhance the activation of the host immune system to tumor-associated antigens. Anticancer vaccines that are being investigated include the use of recombinant viral vectors, recombinant bacterial vectors, peptides and polypeptides, carbohydrates, proteins, whole tumor cells, and