PREFACE

Harnessing the immune system to destroy tumors has undeniable appeal. Current cytotoxic cancer therapies are relatively indiscriminate, with narrow therapeutic windows. Immune effectors have the capacity to precisely target cells for destruction. Cytotoxic therapies often fail because of tumor cell resistance. The immune system can adapt to ever-changing challenges. Cytotoxic therapies are viewed as poisons, whereas immune-mediated cell death is viewed as natural.

The immune system has two arms, cellular and humoral, and each immunotherapy can be broadly described by which arm mediates its activity. Immunotherapies can also be classified by whether they activate immune effectors or involve their passive transfer. For example, active immunotherapy involves immunization to activate T cell or antibody responses in vivo, whereas passive immunotherapy involves the infusion of T cells or antibodies activated or generated ex vivo. Although the most commercially successful products thus far have been monoclonal antibodies administered intravenously, animal models have suggested that immunizations can be used to protect against tumor challenge and more importantly, to destroy established tumors. Over the last two decades, the identification of antigens that can serve as targets for immune effectors and the elucidation of the mechanisms for activating antigen-specific immune responses have resulted in a profusion of strategies for activating tumor antigen-specific immune responses. These so-called therapeutic vaccines, unlike prophylactic vaccines for the prevention of infections, all share some basic attributes, the presence of target antigens, and a method for delivering the antigen into the antigen-presentation machinery in conjunction with other molecules required to provide T- and/or B-cell activation.

The *Handbook of Cancer Vaccines* is intended to provide a comprehensive description of the scientific background for therapeutic vaccines, the challenges to their development, and their current use to treat cancer. After an overview of the immune response to cancer vaccines, this text will describe methods of antigen discovery followed by individual chapters on basic issues regarding all vaccines, such as immune adjuvants and prime-boost strategies. Subsequently, chapters will be devoted to the scientific basis and pre-clinical development of the major vaccine strategies, such as peptide, tumor cell, and dendritic cell vaccines. The last half of the text describes the clinical results for cancer vaccines used to treat many of the common cancers. Finally, chapters are devoted to the monitoring of biologic responses to vaccines and to statistical and regulatory issues affecting the design and conduct of clinical trials of cancer vaccines.

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