

# PREFACE

---

Tumor immunology is a scientific discipline that is driven by clinical translation. For many decades, scientists both at the bench and at the bedside have struggled with determining the role immunity may play in tumor eradication, if any. For many years, the major question driving the field was whether human tumors were immunogenic. Over the last decade, literally thousands of immunogenic proteins related to tumors have been identified, resulting in a host of new targets for immunomodulation.

Successful active immunization against cancer has long been a goal of tumor immunologists. Generating a native endogenous immune response against cancer offers many advantages as compared with more standard anticancer therapies. Stimulating a cellular immune response would allow cancer cells to potentially be eradicated at multiple metastatic sites since competent T-cells can “home” to antigen. Successful vaccination would generate immunological memory, allowing the eradication of tumors at times of disease relapse, which may take place years after primary therapy. The identification of specific tumor antigens has fueled the development of a variety of vaccine technologies aimed at increasing the magnitude of the tumor-specific immune response. Furthermore, technologies have been developed to quantitatively and reproducibly measure tumor immunity. Immunological monitoring techniques have evolved from novel laboratory tools to robust clinical assays capable of estimating the potency of immune-based therapies.

Vaccines for protection against infectious agents have been one of the most successful interventions in medicine. However, few vaccines are utilized to treat ongoing established infections. Similarly, cancer vaccines have had little success in eradicating growing cancers. The last several years have led to the development of a variety of clinical strategies that may prove more effective in established disease states. Adoptive T-cell therapy, donor lymphocyte infusion after transplant, or infusions of novel cytokines may all boost tumor-specific T-cell immunity above the level that can be achieved with vaccination alone. Indeed, stimulating the “graft-vs-leukemia effect” with donor lymphocyte infusion in subjects who have relapsed after allogeneic transplants for hematopoietic malignancy has become a standard of care and a life-saving measure. Thus, immune-based strategies can be developed both to prevent relapse in minimal residual disease states, as well as to treat existing cancers.

The last decade of research in tumor immunology has seen the adoption of a multitude of immune-based therapies into the standard practice of oncology. Monoclonal antibodies targeting tumor antigens have revolutionized cancer treatment for patients with lymphoma, breast cancer, and other solid tumors. Antibody therapy has now been shown to have both biological, as well as immunological, effects. Antibodies targeting growth factor receptors will bind to inhibit cell signaling and limit unregulated growth. However, the binding of a monoclonal antibody may also activate immune system cells to respond to antigens expressed by tumors, thus stimulating endogenous immunity.

Finally, the role of the tumor microenvironment is critical in modulating and shaping the tumor-specific immune response. Advances in recent years have pointed to the most important mechanisms limiting the immune response in cancer patients, and these envi-

ronmental influences can be modulated in vivo with novel reagents. Thus, treatments are directed both at initiating and expanding a cancer-specific immune response, as well as reigning in the environment from preventing the function of immune effectors. Clearly, combination immune-based approaches may be more potent than any strategy used in isolation.

*Immunotherapy of Cancer* provides a comprehensive overview of both the science and clinical translation of tumor immunology. Each chapter is designed to give the reader the scientific basis behind the novel therapy and outline basic theory, as well as practical treatment applications. Tremendous scientific advances in basic and molecular immunology have resulted in explosive growth both in our understanding of how cancer is recognized by the immune system, as well as in our ability to control and modulate that recognition. *Immunotherapy of Cancer* provides the springboard for applying the most important findings in tumor immunology to any basic laboratory program or clinical oncology practice.

**Mary L. Disis, MD**



<http://www.springer.com/978-1-58829-564-4>

Immunotherapy of Cancer

Disis, M.L. (Ed.)

2006, XII, 516 p. 52 illus., Hardcover

ISBN: 978-1-58829-564-4

A product of Humana Press