

Part IV

Dendritic Cells in Cancer: Clinical Aspects

Understanding the crucial role of dendritic cells in tumor development and maintenance of antitumor immunity has resulted in immediate attempts to apply this knowledge to clinical practice in using dendritic cells for therapeutic purposes. Unexpected success in preclinical animal models and in in vitro human experiments led to initiation of multiple clinical trials in a variety of institutions focusing on safety and clinical applicability of dendritic cell vaccines for cancer therapy. Although the induction of tumor-specific immune responses is often evident, clinical responses in cancer patients were limited and inconsistent. A new generation of enhanced dendritic cell vaccines is under intense testing in preclinical settings and was designed based on growing understanding of dendritic cell biology and behavior in the tumor environment. The final section of the book addresses factors of importance to clinical aspects of cancer, with emphasis on issues relevant to immunotherapy. Chapter 19 describes and analyzes dendritic cell trafficking and homing in the tumor microenvironment, issues which play a key role in designing and determining the efficacy of dendritic cell vaccines after an adaptive transfer of cell in patients with cancer. A comprehensive functional and phenotypic characterization of dendritic cells in involved and non-involved draining lymph nodes is reviewed in Chapter 20. Chapter 21 discusses obstacles and problems for use of dendritic cell vaccines in clinical trials that continue to limit their effectiveness and feasibility for patients with cancer. Chapter 22 explains current optimal approaches for dendritic cell-based immunotherapy and presents multiple examples of their utilization for different tumor types in ongoing clinical trials. Chapter 23 focuses on the use of genetically modified dendritic cells in immunotherapy, as an illustration of the means available to improve the efficacy and value of therapeutic dendritic cell vaccines for cancer. Chapter 24 describes dendritic cell-derived tumors, their current classification, and available therapeutic modalities and prognosis of the diseases. This unusual perspective on dendritic cell biology is not widely discussed, but might be more appreciated in the future with the development of novel genetically engineered dendritic cell vaccines. Finally, Chapter 25 presents thoughts on future directions for research that may enhance the quality of dendritic cell-based therapy for cancer.