

## BOOK REVIEW

### BIOLOGIC THERAPY OF CANCER

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Pub: J B Lippincott Company, Philadelphia, USA, 1991, pp 816

Price: US \$125.00

ISBN 0-397-51027-6

This is a mammoth text with 33 Chapters written by 78 expert contributors and brings up to date current knowledge and practices in the treatment of various types of cancer using an armoury of modern biological "weapons".

The text is divided into 3 Parts. The first Part 1 consisting of 6 Chapters which clearly enunciates the principles of tumor immunity and the history of the immunotherapeutic approach to the treatment of cancers. Fundamental studies, many using radiochemicals, have enabled clarification of ideas of the processes involved whereby T cells mature into different types of effector cells and their subsequent involvement in the inhibition of cell growth. Chapter 2 discusses the basic principles of antibody-mediated responses while Chapter 3 deals with tumor antigens and including their relationship with oncogenes. Chapter 4 discusses various disorders of immunocompetence and their association with cancers, and particularly with non-Hodgkins lymphomas and Karposi's sarcoma. Included are cancers in AIDS, in organ transplant recipients, in long-term dialysis patients and resulting from immunosuppressive therapy. Chapter 5 provides an account of the principles involved in the clinical evaluation of biologic agents such as the interferons and interleukins. A table (5-3) provides a listing of useful common toxicity criteria on a 0-5 scale of increasing toxicity. Chapter 6 concluding the first Part provides an interesting history of cancer immunotherapy from the late 19th century to present times. A table (6-4) summarises the treatment of cancer patients with vaccines.

The main thrust of the text is in Part 2 consisting of 22 Chapters and focussing attention on the therapies now used in the treatment of cancers including the uses of the cytokines. T-cell growth factor, interleukin-2 has received intense study over 15 years and Chapter 7 reviews the current status of this cytokine in cancer therapy. Chapters 8 and 9 respectively review the preclinical trials and the clinical applications of IL-2. A table (9-3) lists and summarises the treatment of side-effects associated with IL-2 therapy. Adoptive cellular therapy uses lymphocytes in cancer therapy and Chapters 10 to 13 cover this aspect in which immune cells with antitumor properties are transferred to the tumor-bearing host. Included in the clinical applications is the use of [<sup>111</sup>In]indium labelled tumor-infiltrating lymphocytes (TIL) for imaging. Chapters 14 and 15 are devoted to the basic principles and uses of the interferons in cancer therapy all possessing a daunting array of capabilities summarised in a table (14-4). Clinical applications are specifically covered in Chapter 15 with uses of interferons in the treatment of conditions such as hairy cell leukemia, chronic myelogenous leukemia, renal cell carcinoma, cutaneous melanoma and numerous other cancers of the bladder, Basal cells, colon, gliomas and nasopharyngeal cancers. In all these conditions INF-alpha especially has significant antitumor properties. Section 15.6 deals specifically with HIV and Karposi's sarcoma. Another useful cytokine in the armoury of cancer therapy drugs is tumor necrosis factor (TNF) and Chapters 16 and 17 review the basic principles, preclinical studies and the clinical applications of TNF. Chapter 18 discusses experimental and clinical trials involving a combination of cytokines in therapy such as the use of IL-2 and

INF-alpha or INF-gamma, and also in combination with chemotherapeutic drugs including cyclophosphamide, flavone-8-acetic acid and indomethacin.

Chapters 19 and 20 discuss the therapeutic uses of colony-stimulating factors (CSFs) (granulocytes and macrophages). In all these Chapters concerning cytokines the relationship of the genetic make up of the DNA (genes) is correlated with the mode of action and effects of the drug therapy insofar as this is known. The use of monoclonal antibodies (Mabs) to tumor antigens for delivery of radiation therapy (radiolabelled antibodies) and combined with immunotoxins is a field of application which is rapidly expanding. Chapter 21 reviews the basic principles and applications of Mabs in cancer therapy using immunotoxins (Section 21.2) and radioisotope conjugates (Section 22.3). Chapter 22 discusses uses of antibodies in general for cancer therapy, for B-cell lymphomas, T-cell leukemia/lymphoma and melanomas. A useful table (22.3-3) lists diagnostic trials with radiolabelled Mabs and table (22.3-4) therapy trials with radioisotopically or toxin labelled Mabs. Section 22.4 discusses specifically the use of Mabs for immunodiagnosis and immunotherapy of epithelial ovarian cancers. A table (22.4-3) lists Selected Series of Radionuclide Imaging of Ovarian Cancer involving  $^{125}\text{I}$ ,  $^{111}\text{In}$  and  $^{114}\text{In}$ . The applications of Mabs in the treatment of solid tumors is discussed in Section 22.5. The combination of radionuclides and antibodies in cancer therapy was first identified using polyclonal antibodies and  $^{131}\text{I}$  and  $^{90}\text{Y}$  and discussed in Section 22.6. Antibodies to growth factors and receptors are discussed in Section 22.7. Chapters 23 to 26 review immunotherapy by active immunization and the use of non-specific stimulants and immunomodulators. Chapter 26 especially discusses cancers of the colon and melanomas.

Part 3 consisting of 7 Chapters discusses alternative strategies for biologic therapy such as the use of thymosins (Chapter 27) and extracorporeal immunoadsorption of plasma using protein A columns (Chapter 28). Systemic activation of macrophages by liposomes containing immunomodulators is discussed in Chapter 29 while Chapter 30 addresses the problem of antiangiogenesis. Chapter 31 reviews differentiating factors such as retinoids, DNA/RNA inhibitors, growth factors, hormones, tumor promoters and dihydroxyvitamin  $\text{D}_3$ , which can induce transformed cells to differentiate and lose proliferating capacity. Chapter 32 discusses the potential of a new approach to biochemical cancer therapy using antisense compounds. The final Chapter 33 is devoted to a review of immunomodulation by anticancer drugs including those currently in routine use.

The text contains approximately 6,711 references and is completed by a comprehensive index. It is a "feast of knowledge" for all those investigators including clinicians, clinical chemists, biochemists, pharmacologists and geneticists who are concerned with the fundamental studies and treatment of cancers. Even for a non-medically qualified reader (like myself) the text is very intelligible and makes compulsive reading.

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August 1991