Tumor Models in Cancer Research

Edited by Beverly A. Teicher, Humana Press, 2001, US$175.00, 690 pages in hardback, ISBN 0-896-03887-4

That an entire volume can be devoted to *Tumor Models in Cancer Research* points out the depth of the field, which now spans several decades and multiple generations of animal tumor models. This book, edited by Beverly Teicher, is focused on the use of tumor models for preclinical therapeutics.

The book has nine parts with multiple chapters, most of which include several tables and charts, and a few figures. Part I provides an introduction into the history of tumor models, focussing entirely on cancer therapy. Part II deals with *Transplantable Syngeneic Rodent Systems*, including detailed reviews of murine leukemias and B16 melanoma.

Part III provides an outline of human xenografts: a thoughtful and well illustrated (albeit black and white) chapter is devoted to the use of *GFP-Expressing Metastatic-Cancer Mouse Models*, whereas a chapter describing *Xenotransplantation of Human Cell Cultures in Nude Mice* is only three pages long.

Part IV deals with *Carcinogen-Induced Tumors*, including a thorough historical description of mammary cancer models and retinoids. Given the growing enthusiasm for targeted therapeutics, it is somewhat surprising that Part V (*Mutant, Transgenic and Knockout Mouse Models*) provides superficial coverage. This section focuses entirely (in complete and well-referenced chapters) on transgenic mice that overexpress transforming growth factor (TGF)-β, cyclin D1 and carcinoembryonic antigen, with a lone chapter on knockout animals devoted exclusively to p53 deficiency.

Part VI builds further on *Metastasis Models*, adding two chapters to the already thorough introductory coverage of this important area. Part VII discusses *Normal Tissue Response Models* in five chapters, among which is a well-written chapter devoted to the SENCAR mouse skin tumorigenesis model. Part VIII focuses on *Disease and Target-Specific Models*, including chapters on animal models of melanoma, and severe combined immunodeficiency (SCID) models of leukemia and lymphoma. Again, there is no mention of genetically engineered mouse (GEM) models for melanoma, leukemia and lymphoma, despite an extensive literature on these models, and a growing sense of opportunity on the use of GEM animals to model biologically based therapies.

The introductory chapters provide a rich perspective on the development of traditional animal models, but are somewhat uneven. Many chapters are completely outlined on the title page, providing easy access to various subchapters, with headings such as: *Tabulation of Chemotherapy Trials: Desired Information From a Tumor Model*; *Apoptosis in Tumor Biology* and *Staging in Canine and Feline Tumors*. Several chapters, however, provide minimal or no outlines, making it more difficult to quickly access information.

Many chapters contain a literature review of a particular pathway or mechanism, followed by a summary of applicable mouse modeling approaches. Although aspects of cancer biology and genetics are touched upon in individual chapters, a large literature on the use of tumor models to aid the understanding of the basic biology of angiogenesis, neurofibromatosis, Rb signaling and telomerase is not included, nor are discussions on using cancer models for gene discovery. In addition, with respect to imaging, computerized tomography (CT), magnetic resonance imaging (MRI), positron emission tomography (PET) and luciferase bioimaging are not discussed. A section on new approaches and technologies, including regulatable systems and conditional knockouts, would have been welcome. However, the book is already almost 700 pages, and would have been substantially longer if it also detailed tumor biology and genetics, GEM models and imaging modalities.

The strength of this book includes valuable practical aspects of model design that are widely applicable, such as appropriate measurement of experimental progression and endpoints, valid drug trial designs and the use of anesthesia. The book provides a historically complete perspective on the development of traditional animal models, how these models have been applied to solve particular problems, and the advantages and pitfalls of each approach. In addition, because GEM models have recently been put into fast-track development by the National Cancer Institute (http://www.nci.nih.gov) for preclinical testing, this is an excellent time to step back and summarize past experience and insights into the use of non-GEM mouse models for preclinical therapeutics. The general title of this text was somewhat at odds with its specific focus on cancer therapy. As a primer on preclinical therapeutics, however, this textbook provides useful lessons and tools for anyone entering the field.

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