Book Reviews

Taxol®: Science and Applications. Edited by Matthew Suffness. CRC Press, Boca Raton, FL. 1995. 426 pp. 18.5 × 26 cm. ISBN 0-8493-8382-X. $129.95.

This is an excellent book describing almost everything about taxol (paclitaxel) from discovery to clinical studies. The editor, Matthew Suffness, who devoted himself to the development of this potent anticancer drug over a 20 year period at the National Cancer Institute and brought it to fruition, passed away last June due to fatal complications after a bone-marrow transplant to treat leukemia. The book starts with the introductory section by Suffness and Wall on the discovery and development of taxol and by Hartzell, Jr. on a brief history of the yew tree, which provides a good overview. Then, four sections follow: "Supply of Taxol", "Biology of Taxol", "Chemistry of Taxol", and "Clinical Studies". For Supply of Taxol, plantation, cell culture, and chemical synthesis and semisynthesis are described. The chapter by Holton et al. on the semisynthesis of taxol concisely reviews different approaches including his own process that has been adopted for industrial production of taxol. Wender et al. discuss a variety of approaches to the construction of baccatin skeletons. The only chapter lacking here is the total synthesis of taxol. This reviewer felt a bit strange why Suffness did not include a chapter describing two successful total syntheses achieved by Holton and Nicolaou a year before the publication of this book. For Biology of Taxol, biosynthesis, preclinical antitumor activity, biopharmaceutics, and the use of taxol in cell biology are discussed. The chapter by Floss et al. on the biosynthesis of taxol is intriguing. Straubinger et al. describe the issues on the formulation of this very hydrophobic anticancer drug. Vallee's chapter illustrates interactions of taxol with tubulin and microtubules in relation to taxol's mechanism of action. In the Chemistry of Taxol section, detection, isolation, structure, and chemistry of natural taxoids and medicinal chemistry are described. Kingston gives a concise and well-organized review on naturally occurring taxol-like compounds (taxoids). The chapter on the medicinal chemistry of taxol by Georg et al. is excellent and is the highlight of this section, which compiles all important structure−activity relationship (SAR) studies up to the summer of 1994. The final section discusses the clinical studies of taxol. Arbuck and Blaylock present an excellent chapter illustrating exciting clinical results and issues in the development of this drug with critical eyes. This chapter also describes the clinical results of the related anticancer drug taxotere (docetaxel).

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Cancer Chemotherapeutic Agents. William O. Foye, Editor. American Chemical Society, Washington, D.C. 1995. xx + 698 pp. 18.5 × 26 cm. ISBN 0-8412-2920-1. $149.95.

This book consists of chapters contributed by experts in the area of medicinal chemistry and pharmacology of cancer chemotherapeutic agents and represents an extensive treatise on the subject. The text begins with two general chapters, and the first chapter consists of an introduction and historical perspective. Chapter 2 was written by investigators at the National Cancer Institute (NCI) and provides an overview of the *in vitro* antitumor screen used by the Developmental Therapeutics Program, NCI. Also, this chapter discusses the application of the *in vitro* assay results to the prediction of biochemical mechanisms of action using the COMPARE algorithm.

The remaining 14 chapters address specific classes of anticancer agents, and many of the chapters are subdivided into distinct sections based upon chemical type or biological activity. Each of the chapters and sections is organized similarly and emphasizes the chemistry and biochemical mechanisms of the cancer chemotherapeutic agents. Each chapter begins with a brief introduction of the class of agents and then follows with discussions on the synthesis and chemistry, anticancer activity, biochemical mechanism of action, metabolism, clinical use, and references. Chapters 3 and 4 provide extensive descriptions on antimetabolites and agents that react with DNA, respectively, and were written by experts from Southern Research Institute. Each chapter contains several sections grouped according to chemical type. For example, chapter 3 on antimetabolites includes sections on fluoropyrimidines, thiopurines, 2′-deoxyribonucleoside analogues, folic acid analogues, and antifolates. Chapter 4 is divided into sections on different classes of alkylating agents. Chapters 5−8 address cancer chemotherapeutic agents that interact with DNA and DNA−protein complexes. Chapter 5 discusses topoisomerase II inhibitors, chapter 6 describes inhibitors of DNA-transcribing enzymes such as the actinomycins, chapter 7 reviews camptothecins and related analogues that inhibit topoisomerase I, and chapter 8 describes DNA minor-groove-binding agents. Antimitotic agents and bleomycins are the subjects of the next two chapters (9 and 10). Steroidal and nonsteriodal agents that block steroid hormone action in breast cancer and prostate cancer are presented in chapter 11. Other approaches in cancer chemotherapy comprise the remaining chapters and include photodynamic therapy (chapter 12), immunomodualtion (chapter 13), cytotoxins (chapter 14), radiation sensitizers and protectors (chapter 15), and oligonucleotides and polynucleotides (chapter 16). The last chapter discusses antitumor antibiotics not covered in previous chapters.

Overall, the book is well organized and well written. Each chapter contains numerous structures, synthetic schemes, and illustrations of chemical and/or biochemical mechanisms. Several halftone illustrations and a few color pictures of space-filling models are also

included in the book to illustrate biochemical mechanisms. References are provided at the end of each section in a chapter. However, the referenced citations do not include publication titles for journal articles. The book concludes with an extensive index.

In summary, this book represents an extensive treatise on the medicinal chemistry and pharmacology of cancer chemotherapeutic agents. This text is recommended as a reference book for medicinal chemists involved in drug design, discovery, and development in cancer chemotherapy. It is also recommended as a valuable resource for institutional libraries and academicians involved in teaching and research in the areas of cancer research and cancer therapy.

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Percutaneous Penetration Enhancers. Edited by Eric W. Smith and Howard I. Maibach. CRC Press, New York. 1995. 500 pp. 16.5 × 24 cm. ISBN 0-8493-2605-2. $125.00.

One of the most recent developments in drug delivery is the development to the marketplace of transdermal delivery systems capable of avoiding the first-pass effect and effectively delivering drugs for sustained periods of time directly through the skin into the systemic circulation. Many of the newer such formulations under development are for drugs which do not penetrate the skin well. To overcome this limitation, a great deal of research has been targeted toward the development of percutaneous penetration enhancers which can aid the delivery of such drugs.

This book is divided loosely into sections covering introductory topics and background information, skin hydration, and the use of a variety of agents as penetration enhancers including alcohols, glycols, amines and amides, dimethyl sulfoxide, Azone, pyrrolidones, surfactants, polymers, fatty acids, ureas, terpenes, liposomes, and cyclodextrins. In addition, chapters on iontophoresis, electroporation, delipidization, ion pairing, and ultrasonic penetration enhancement discuss some of the newer approaches to transdermal drug delivery. Finally, there are a number of chapters concerned with the analytical methodology used in this field and two concluding chapters on new approaches for the future.

Each of the contributions to the book is written by a leading expert in the field, and the scope of the volume encompasses the entire transdermal drug delivery enhancer field. Each paper is fully documented with a complete bibliography, and the volume contains a detailed subject index.

The book will be especially useful for pharmaceutical scientists, polymer chemists, bioengineers, pharmacologists, and physicians working in the areas of both transdermal drug delivery and sustained release of drugs or who have a difficult molecule to deliver for a therapeutic goal, particularly those drugs with a high first-pass effect.

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CNS Neurotransmitters and Neuromodulators Glutamate. Edited by Trevor W. Stone. CRC Press, Boca Raton, FL. 1995. 380 pp. 18.5 × 26 cm. ISBN 0-8493-7631-9. $159.95.

This volume, consisting of 21 chapters, presents a broad review of the state of the art of understanding excitatory amino acid (EAA) neurotransmission. As noted by the editor, the target audience is any active neuroscientist attempting to "keep abreast of topics not in their immediate sphere of interest". Given the explosive growth of information in the field of EAAs, the utility of this book extends to individuals actively engaged in this area of research and would prove particularly useful as core reference work.

Though not explicitly divided, the book broadly contains five sections. The first of these (chapters 1−3) covers the synthesis, metabolism, uptake, release, and subcellular localization of glutamate and were written by some of the true fathers to EAA research (Storm-Mathisen et al., Fonnum and Hassel, Nicholls). The second section (chapters 4−9) includes contributions on the molecular biology, pharmacology, physiology, and regional distribution of glutamate receptor subtypes. This is followed by three chapters on glutamate-activated second-messenger systems as well as the downstream biochemical transduction systems operated by EAAs. Chapters 12−17 discuss the role of glutamate in epilepsy, neurodegeneration, plasticity, and early gene expression, whereas the contributions by Witkin (chapter 19) and Lalonde (chapter 20) detail the behavioral consequences of NMDA and non-NMDA receptor manipulation. Rounding out the 21 papers are discussions by Reynolds on polyamines and glutamate and by Cowell on the relationship between EAA neurotransmission and the hypothalamo−pituitary−gonadal axis.

The text is well illustrated as needed, and each chapter is extensively referenced (from 95 to 331 citations). Quite surprisingly, references are remarkably current with the most recent being late 1994. Chapter length ranges from 10 to 27 pages; each chapter is clearly subdivided and begins with an individual table of contents. The index of 8 pages is adequate to locate key topics.

In short, this book admirably achieves its goal of providing a convenient one-stop overview of EAA neurotransmission. If there is a criticism, this is that chapters are so concisely written that scientists completely unfamiliar with the territory and nomenclature might at first find the volume somewhat onerous. Nevertheless, *CNS Neurotransmitters and Neuromodulators Glutamate* is highly recommended for the library of any department engaged in neurobiological research.

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