

## Book Reviews

**Terpenes, Flavors, Fragrances, Pharmaca, Pheromones.** By Eberhard Breitmaier (University of Bonn). Wiley-VCH, Weinheim. 2006. ix + 214 pp. 6.5 × 9.5 in. \$65.00. ISBN 3-527-31786-4.

This 10-chapter book attempts to organize basic terpene chemistry in a methodical manner, so as to allow a systematic approach to understanding basic terpene structure. Most of the structural details in each chapter are referenced to the three-volume series, *Dictionary of Terpenoids*, by J. D. Connolly and R. A. Hill.

Chapter 1 is a brief discussion of the terms and biosynthetic pathways associated with terpene chemistry. There are a number of figures and tables that offer concise relationships among various terpenes. The next seven chapters give examples of known terpene skeletons of increasing complexity. Chapter 2 contains the hemi- and monoterpenes, Chapter 3 the sesquiterpenes, Chapter 4 the diterpenes, Chapter 5 the sesterterpenes, Chapter 6 the triterpenes, and Chapter 8 a very short review of polyterpenes and prenylquinones.

Each chapter begins with the acyclic skeleton and then proceeds to give examples of related terpenes as a consequence of cyclizations and various alkyl shifts. The tables and figures are well written. The various skeleton systems are well numbered, so it is very easy for the novice to determine various relationships between and among terpenes. At the end of each chapter the author provides brief discussions of natural products that are related to the particular terpene class discussed (e.g., cannabinoids in Chapter 2, pinguianes and presilphiperfolianes in Chapter 3).

Chapter 9 consists of a number of selected syntheses of various terpenes. This chapter would be an excellent resource for teaching organic synthesis of terpenes; it contains some 19 different, very well referenced syntheses. Particularly helpful to students is the use of named reactions in the synthesis and good descriptions of all reagents used.

Chapter 10 contains a description of structure elucidation of terpenes. There is a very brief (<1 page) description of the isolation of terpenes, followed by an example of the structure elucidation using spectroscopic methods. The elucidation is somewhat dated (e.g., the use of the COLOC sequence) and, therefore, of limited value. A brief discussion of absolute stereochemical assignment is included as well. This chapter concludes with a brief description of how terpene structure relates to odor.

The bibliography follows Chapter 10 and is organized according to topics discussed, providing a quick reference guide to a particular topic. Following the bibliography are figures summarizing the various structural relationships between/among terpenes.

The advantage of this book is that it provides an easy to navigate summary of terpene chemistry. It is particularly helpful to a practicing chemist in need of a quick reference to various terpene skeletons. The major shortcoming of this book is that there are a number of statements made without references. For example, in Chapter 4 the author mentions that the podocarpanes are used as an agricultural insect repellent and antifeedant, but does not offer any reference for this statement. The lack of references is consistent throughout the book. Regardless, this book provides a nice, compact reference to terpene chemistry.

**Life Saving Drugs—The Elusive Magic Bullet.** By John Mann (Queen's University, Belfast, Ireland). Royal Society of Chemistry, Cambridge, UK. 2004. viii + 248 pp. 17 × 24.5 cm. £24.95. ISBN 0-854041634-8.

This book describes the discovery and development of antibacterial, antiviral, and anticancer drugs, and it highlights the colorful characters behind the inventions and the huge improvements in quality of life and life expectancy that these drugs have produced.

The book begins by providing a history on the handful of effective drugs that were available at the start of the 20th century, such as morphine, quinine, cocaine, aspirin, and a few inorganic salts for gastrointestinal problems, which had genuine efficacy, but little value for bacterial and viral infections or cancer. At that time, a serious bacterial infection and most cancers were usually untreatable. One hundred years later, there are literally thousands of efficacious drugs; bacterial and viral infections (including HIV) can be successfully treated, and even certain cancers can now be cured. The book describes the evolution of these life saving drugs that have so revolutionized the treatment of disease and emphasizes the roles played by those who discovered these molecules. Considerable attention is given to the new drugs that have emerged as a result of knowledge of the human genome and the ways in which the newer drugs are being designed to tackle disease, particularly cancer, at the genetic level. Chemical structures are provided for all of the key drugs, and the book is well illustrated.

The first chapter provides a nice overview of drugs used prior to and in the early part of the 20th century and some background on the outstanding chemists responsible for the discovery of these drugs. It very nicely sets the stage for the chapters that follow and makes a very interesting and easy read for people of varied backgrounds. The next three chapters deal with drugs for the treatment of bacterial and viral infections and cancer. The final chapter reveals the new advances that have been facilitated by a growing understanding of the genetic basis of different diseases. The inclusion of structures, schemes, and mechanisms adds to the appeal for the general reader as well as for a scientist in a specialized field. The book is not a research text, but the bibliography allows readers to gain access to key research papers, and it provides an excellent source of background material for students of medicinal chemistry, pharmacy, and even medicine and pharmacology.

This new edition has been updated and expanded and includes the chemical structures and modes of action for most of the drugs discussed. It will be of interest to anyone who wants to know more about the molecular entities that comprise life saving drugs. The book can also be read as a history of drug development during the past 100 years by those with only a passing knowledge of chemistry. For anyone entering the medical profession, pharmacy, or nursing, it will provide a superb basic knowledge of all drugs they are likely to encounter, including their modes of action. For the chemist, it will provide the fundamental knowledge of life saving drugs. For the nonscientist who wants to know about “superbugs”, SARS, Ebola, and all of the wonderful advances in treating cancer, it is illuminating and easy to read.

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**Natural Products Isolation, 2nd Edition (Methods in Biotechnology, Vol. 20).** Edited by S. D. Sarker (University of Ulster), Z. Latif (Molecular Nature Limited), and A. I. Gray (University of Strathclyde). Humana Press Inc., Totowa, NJ. 2006. xii + 515 pp. 15.5 × 23.5 cm. \$135.00. ISBN 1-58829-447-1 (Hardcover). eISBN 1-59259-955-9 (e-book).

This book is a revised, updated, and enlarged version of *Natural Products Isolation*, which was edited by the late Dr. Richard J. P. Cannell as one of the pioneering volumes of *Methods in Biotechnology*, namely, Volume 4, published by Humana Press in 1998. As in the first edition, most aspects of natural products, extraction, preparation, and their isolation, are covered here as well. Three very useful new chapters—"Hyphenated Techniques", "Purification by Solvent Extraction Using Partition Coefficient", and "Isolation of Microbial Natural Products"—were added to the existing, but revised and updated 15 chapters. The practical style employed in the first edition was also maintained to enable the reader and researcher easy follow-up and application. Up to date, all new natural product isolation techniques are covered and illustrated, along with conventional ones. Each chapter is well organized and contains a summary, introduction of principles with discussion, recipe type instructions for the laboratory, list of materials and reagents required, and updated references; troubleshooting guides and hints in and at the end of the chapters as "notes" are particularly helpful. However, some of the introductory and basic information was repeated in several chapters, which could have been avoided. Numerous schemes, tables, and figures really help in understanding and locating useful information on the isolation of natural products and are especially beneficial and time-saving, if not a must, for undergraduate and graduate students not only in pharmacy, pharmacognosy, phytochemistry, and natural product chemistry but also for all who are dealing with and interested in a wide spectrum of natural products, including microorganisms and marine organisms.

Disappointingly, structure elucidation and bioassays of natural products were covered only very briefly. There are minor typos that may be somewhat distracting. Some of the examples in the book are formatted just like a published paper, which seems out of context and beyond the scope of this series. The book has an index, but it is not comprehensive enough to be very useful.

Natural product isolation is a hot topic and will continue to be. This book will serve as an excellent and affordable reference book to all who are involved and interested in natural products. From another point of view, the practical information that this book contains can save money and time in individual laboratories. *Natural Products Isolation* is also strongly recommended as a practical aid for faculty, lecturers, and advisors involved in the teaching of natural products. While the hardcover is durable enough for day to day use in research laboratories, it is good and practical that this edition is also available on-line as an electronic version. The continuing rapid developments in natural product isolation and new techniques will soon demand another update and new chapters in this series.

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**Medicinal Plants of Asia and the Pacific.** By Christophe Wiart (University of Malay, Kuala Lumpur). CRC Press/Taylor & Francis, Boca Raton. 2006. xxii + 306 pp. 7 × 10 in. \$189.95. ISBN 0-8493-7245-3.

In recent times, there has been great interest in bridging the gap between modern pharmaceutical science and traditional medicine. Many hope that by tapping into the repertoire of traditional remedies

scientists can more easily find compounds with valuable pharmaceutical properties. In this vein, the ethnopharmacologist Christophe Wiart has written the book *Medicinal Plants of Asia and the Pacific*, believing that plant species described therein may be "the very last gift of Mother Nature in the cause of human health". Indeed, the wealth of information that Wiart presents is a valuable resource, covering a wide breadth of potential subject species for investigation with reference to both scientific research and traditional prescriptions. The work is of particular importance also because it covers the Pacific Rim, a somewhat underutilized geographic area with species having high therapeutic potential.

The book itself is divided into 37 chapters, each covering one of 36 families of interest and in total covering 173 species. The author orders the families botanically, starting with the most "primitive" and ending with "more recent discoveries". Each chapter begins with a general survey of the family and its botanical and chemical properties, before moving on to individual descriptions of species. Each of these entries, in turn, is subdivided into descriptions of the plant's botany and ethnopharmacology.

Though each entry is generally brief, often not more than half a page, the author succeeds in succinctly including a great amount of information. He describes in detail the appearance of the plant, even including many dimensions that give the reader an excellent idea of the scale and size of the species in question. Each species also has a helpful botanical line diagram, allowing for easy identification in the field. Field expeditions will also be aided by the description of the plant's habitat and range, while the book's slim size makes it relatively portable even in the rainforest, where many of the described species live.

Further, the ethnopharmacology section of the entry gives the reader a good impression of the species' pharmaceutical potential, as it includes both how the species is used traditionally and any known chemistry. These descriptions, again, are rather brief but are supported by a list of references at the end of the chapters that provide more in-depth access to research on a particular species. These descriptions are further illuminated by chemical structures of bioactive compounds found within the species.

However, many of the species the author describes are chemically unexplored and are only known from their traditional use by shamans and healers. These descriptions of species poorly understood chemically are central to Wiart's purpose here; through them he highlights species that have been thought to be medicinally potent for generations, but have been, up to now, inaccessible for research. This book can then be thought of as his way of nudging pharmaceutical research into bringing together both modern science and traditional medicine. Accordingly, this book promises to be an excellent resource, for researchers of similar opinions, as a source of information and inspiration.

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**Cell Culture Technology for Pharmaceutical and Cell-Based Therapies.** Edited by S. S. Ozturk and W.-S. Hu (Centocor, Inc. and University of Minnesota, respectively). CRC Press/Taylor & Francis, Boca Raton. 2006. xiv + 755 pp. 7 × 10 in. \$179.95. ISBN 0-8247-5334-8.

Rapid growth in the biopharmaceutical industry in recent years, in both the value and variety of novel products, has turned this once fledgling industry into an important player in the global economy. As research on protein therapeutics continues to grow and many new professionals enter careers related to this technology, there is a need for a comprehensive, single volume treatise on cell

culture technology that can serve as a resource for information for seasoned professionals and for those new to any specific area of cell culture technology. Thus, this book is a timely piece that provides an understanding of cell culture technology.

This book covers a wide range of topics essential to cell culture (mammalian cell) technology in 20 chapters written by more than 35 authors, covering aspects of cell biology and biochemical engineering used in pharmaceutical process development and manufacturing.

The book begins with an overview of cell culture technology and provides a historical perspective. The second chapter describes manipulations and the genetic engineering of cells for the production of biotechnology products. The chapter discusses, in detail, the steps involved in the process of construction, selection, and screening of stable cell lines for industrial production of biotechnology products. A detailed discussion on medium development is presented in Chapter 3, focusing on the composition of classical animal culture media, with emphasis on the development of serum-free formulation. Chapter 4 outlines the current understanding of cell metabolism for optimizing the performance of cell culture systems, while Chapter 5 addresses glycosylation and post-translational modification of proteins and their importance for product quality. Chapters 6 through 11 offer detailed guidance on the operation of bioreactors and production facility design. Descriptions of the design of aeration, mixing, and process control for batch and perfusion bioreactors are included. In addition, details of the optimization of protein expression from transient, batch, and perfusion systems are also included. Chapters are comprehensive in their coverage and provide extensive guidelines for cultivation of mammalian cells for the production of recombinant proteins.

Chapter 12 presents a broad review of the principle of harvest clarification and product capture technologies. This is followed by detailed coverage of downstream processing (Chapter 13), and a comprehensive outline for drug formulation is discussed in Chapter 14. Chapter 15 covers the regulatory requirements for process and equipment validation, while Chapter 16 discusses issues and paradigms in the design and construction of cell culture facilities. Chapters 17 and 18 present two unconventional methods for protein production using cell culture technology. Chapter 17 deals with transient expression methods that can be used on a large-scale production of proteins, while in Chapter 18, a detailed description is presented covering bioengineering issues of *in vitro* insect cell culture, production characteristics, and application of the insect cell-baculovirus expression vector system (IC-BEVS). The book concludes with two chapters on stem cells and their application for cell-based therapies.

In conclusion, this book presents information that should be of great interest to those in the fields of biopharmaceuticals. A few typographical errors were noted throughout the text, although they were not significant enough to deter from the impact of the chapters. Overall, it can be highly recommended to anyone interested in cell culture technology, since it provides a comprehensive overview of its subject.

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