

Book Reviews

Combinatorial Peptide and Nonpeptide Libraries. Edited by Günther Jung. VCH Publishers, Inc., New York, 1996. xxvii + 544 pp. 17.5 × 24.5 cm. ISBN 3-527-29380-9. \$170.00.

This book represents an attempt to capture some of the fundamental concepts (and show examples) of applied combinatorial methods. Despite the rapid pace at which the field is progressing, the authors have produced a work that is current through mid-1995.

There are 18 chapters, seven of which were coauthored by the editor. Each chapter is written from the perspective of a mentor explaining to a beginner, which should be appealing to newcomers in the area or make the book a useful teaching aid. Each chapter combines good written descriptions of their topics with real experimental results (i.e., HPLC and mass spectral plots, diagrams of synthesizers, biological results, etc.).

Most of the book covers peptide libraries, although Chapter 2 provides a very brief summary of solid phase nonpeptide synthesis. The highlight at the end of Chapter 2 is a table of linkers and cleavage conditions relevant to organic synthesis and a summary of organic name reactions reported thus far on solid support (with references). Other chapters present discussions about various methods associated with preparing and analyzing linear and cyclic peptide libraries. Since the book is a compilation from several authors, the contents of these chapters overlap to varying extents. Noteworthy however is the lucid discussion of mass spectral analysis of peptide libraries, presented in general terms, that is presented in Chapter 8. Chapters 16 and 17 are excellent reviews of polymer supports at the macroscopic level. Chapter 17 ends with a nice table showing chemical structures, cleavage conditions, physical properties, supplier, and price for all currently used supports.

The book ends in an awkward fashion with a chapter dedicated to a computer program used to assist in mass calculations, mass distributions, etc. A more useful concluding chapter would have addressed the data management issues associated with combinatorial libraries and subsequent biological testing. This important, yet frequently overlooked, aspect of combinatorial chemistry is not addressed anywhere in the book. Another limitation of the book's coverage is that it does not provide information or examples of structurally-biased chemical libraries which have become of premier interest recently. These are things to look for in the second edition of this book which the editor claims is already being written.

Overall, this book contains current ideas, examples, and references from the field of combinatorial chemistry and is a valuable contribution. Chemists working in the area, or students in special topic courses, can reap

the wisdom of many contributing experts by adding this volume to their libraries.

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Bacteria and Antibacterial Agents. By John Mann and M. James C. Crabbe. Spektrum Akademischer Verlag GmbH; copublished in the United States by University Science Books, Sausalito, CA, 1996. vii + 74 pp. 19 × 24 cm. ISBN 0-935702-91-1. \$17.25.

This slim, paperback volume is one of three in a series titled *Biochemical & Medicinal Chemistry*; the other volumes are *Neuropharmacology* and *An Introduction to Biotransformations in Organic Chemistry*. The stated aim of this series is to "present full accounts of topics which are at the interface of chemistry and biology, from medicinal chemistry to molecular biology. The topics chosen for inclusion are popular subjects for upper-level undergraduate and postgraduate modular courses, and yet they receive inadequate coverage in traditional textbooks of organic chemistry and biochemistry". This volume does a reasonable job in meeting this aim, especially for those who know very little about antibacterial agents, and there are numerous, clearly drawn chemical structures to accompany the text.

However, there are some areas in which the presentation could be considerably improved. First, the title is misleading because only one chapter, consisting of a little over nine pages, is devoted to bacteria—the book is really about antibacterial agents. Second, it would be very helpful to those new to the area of antimicrobial agents if the authors briefly described the key differences between bacterial, viral, fungal, and parasitic microorganisms as well as a few of the major drugs used to treat human diseases caused by these organisms. The space used to cover this topic could easily be saved by eliminating Figures 1 and 1.3 from Chapter 1 which present the biosynthesis of tetrahydrofolate and the chemical deacylation of cephalosporins in unnecessary detail. Also of doubtful value to those being introduced to antibacterial agents for the first time is a major portion of Chapter 4 devoted to the biosynthesis of β -lactam antibiotics. Third, the authors make the common mistake of confusing antibiotics with antibacterial agents. Antibiotics are natural products, as well as their close synthetic analogs, produced by molds and other organisms and have a range of antimicrobial activities (including antibacterial). Antibacterial agents, on the other hand, may be either antibiotics or compounds (e.g., sulfonamides and quinolones) initially prepared by organic synthesis, often for an unrelated purpose. Finally, Chapter 6, New Antibiotics and New

Strategies, fails to identify unique bacterial targets that have recently emerged, such as virulence genes and their protein products, or the vast array of new chemical structures for antibacterial testing available through combinatorial synthesis.

In spite of these shortcomings, this volume can serve as a concise, inexpensive introduction to antibacterial agents. Although no references are cited, there is a section which lists current sources for further reading for each of the six chapters.

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Ethnobotany: Principles and Applications. By C. M. Cotton. John Wiley and Sons, Ltd., Baffins Lane, Chichester, West Sussex, PO19 1UD, England. 1996. ix + 424 pp. 15 × 23.5 cm. ISBN 0-471-95537-X. \$49.95 (pbk).

Ethnobotany, the study of the uses of plants by aboriginal people, is undergoing a resurgence in popular and professional interest. Numerous edited books have reported recently on research activities in all corners of the globe. Adventurous accounts by contemporary ethnobotanists working in the field are as fashionable today as were accounts by the great naturalists in the late 19th century.

A comprehensive overview, more introductory than detailed in scope and content, this textbook is another cultural marker in the ethnobotanical revival. After defining ethnobotany, as part of a larger enterprise he labels ethnoscience, the author describes basic botanical principles and methods in the next three chapters. Three more chapters discuss traditional botanical knowledge and subsistence on both wild and domesticated plants, and the role of plants as materials in the production of traditional goods.

The book then shifts to phytochemistry, for only one chapter, before moving on to a discussion of anthropological work in ethnobotany. Folk taxonomy, the nature and meaning of individual plants, and culturally-derived patterns of use are outlined with many interesting examples from very different cultural groups. After chapters on palaeoethnobotany, and applied ethnobotany in commercialization and conservation, the author closes with a plea for sustainable development of our limited plant resources.

With a major emphasis on botany and some consideration of the cultural dimension, there is brief discussion about the role of chemistry in ethnobotany. Three primary applications of botanical knowledge are in agriculture (food), arts and crafts or production of materials and goods, and health (drugs). Pharmaceuticals are mentioned and discussed in greater detail than traditional herbal medicines.

For readers who are not very familiar with ethnobotany, and for those researchers who are involved in studying medicinal plants, this book provides a very good introduction. Many facets are presented and

discussed, though there still might be confusion regarding the differences between ethnobotany and economic botany, phytochemistry and pharmacognosy, and the interrelationships between these disciplines and the use of herbal remedies by members of certain cultural groups, including our own in the United States.

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Handbook of Essential Fatty Acid Biology. Biochemistry, Physiology, and Behavioral Neurobiology. Edited by Shlomo Yehuda and David I. Mostofsky. Humana Press, Totowa, NJ. 1997. x + 470 pp. 15.5 × 23.5 cm. ISBN 0-89603-365-1. \$145.00.

Advances in the understanding of the function and metabolism of fatty acids has paralleled recent significant strides in the definition of their chemistry and biochemistry. The role of fatty acids, and lipids in general, in health and disease, e.g. blood pressure and multiple sclerosis, is being increasingly appreciated. Nonetheless, fatty acid research has been relatively limited compared to other areas such as peptides and proteins. The effects of fatty acids on cognitive and behavioral functions, with a few exceptions, have received scant attention.

Thus, the objective of this book is to examine some of the important scientific aspects of fatty acids, from their biochemistry to their physiological consequences in health and disease with particular attention to their cognitive and behavioral roles. Toward this goal, the biochemistry and biology of fatty acids are reviewed in three parts: (I) biochemical properties, (II) physiology and health, and (III) learning, cognition, and complex behavior. Part I is comprised of six chapters that address permeability of the blood-brain barrier to circulating free fatty acids, fatty acid metabolism in the brain, the status of these lipids in alcoholism, biological properties of oleic acid, *n*-3 polyunsaturated fatty acids and cytokine synthesis, and fatty acid regulation of endocrine activity. The seven chapters in part II address omega-3 and omega-6 essential fatty acids, alpha-linolenic and docosahexaenoic acids in infants, neural function following *n*-3 fatty acid depletion, polyunsaturated fats and learning, fatty acids, phospholipids, and schizophrenia, and the seizing brain. The last part consists of five chapters that consider essential fatty acids and behavior, oral and postingestive controls of fat intake, the physiological role of fatty acids in infancy, omega-3 fatty acid deficiency and behavior, and effects of essential fatty acid preparation (SR-3) on brain lipids, biochemistry, and behavioral and cognitive functions. Each chapter includes a comprehensive and timely list of references. The book includes a list of contributors and concludes with an adequate subject index.

In summary, this is a well-written summary of selected areas of specialized research in the field of fatty