Book Reviews

Nobel Laureates in Chemistry 1901-1992. Edited by Laylin K. James. American Chemical Society and Chemical Heritage Foundation, Washington, D.C. 1993. xviii + 798 pp. 14.5 × 22.5 cm. ISBN 0-8412-2690-3. $34.95 (paperback).

Nobel Prizes represent the epitome of recognition of accomplishment in the fields of chemistry, physics, physiology/medicine, literature, economics, and peace. In this book, the first of the *History of Modern Chemical Sciences* series, are collected short, authorative biographies—ranging in length from 3 to 12 pages—of the first 117 Nobel Laureates in chemistry. In most instances, these biographies are written by former students, professional associates, or co-workers of the prize winners. They describe the laureates' eduction, scientific achievements, personal and professional lives, and family backgrounds. Each biography includes primary and secondary references and a portrait of the laureate.

This comprehensive collection of biographies allows comparison of these premier chemists. Interestingly, the biographies reveal that as children, 13 of these chemists had chemistry sets or home laboratories, most of the prize winners prior to 1946 were from Europe, and following 1946 most have come from the United States. This modestly priced book is recommended to everyone who has an interest in the history of chemistry.

Staff

Quinolone Antimicrobial Agents. Second Edition. Edited by David C. Hooper and John S. Wolfson. ASM, Washington, D.C. 1993. xiv + 549 pp. 18 × 25.5 cm. ISBN 1-55581-059-4. $79.00.

This volume contains 29 chapters dealing with a variety of subjects related to quinolone antibacterial agents such as the laboratory aspects, pharmacology, clinical applications, and adverse effects. It is an expanded volume of the first edition which was published in 1989, with a comprehensive updated knowledge on quinolones from general information to their clinical uses. Many chapters in the original edition have been extensively revised with the addition of 13 new chapters.

In his introductory chapter, Hooper mentions the addition of a chapter on "structure–activity relationship" by L. A. Mitscher, P. M. Devathale, and R. Zavod. This is a well-written chapter providing valuable information and should be of great interest to medicinal chemists. This lead chapter also serves as the standard of high quality that we can be expected from the rest of the chapters. The previous single chapter on mechanisms of action and resistance has been revised into 5 chapters on mechanism and bacterial killing, quinolone–DNA interaction, mechanism of bacterial resistance, clinical resistant bacteria, and interaction on eukaryotic topoisomerases, providing vast information to researchers working on the quinolone resistant problem. This volume also includes chapters on the uses of quinolones in head and neck infections, central nervous system infections, and animal infections which were not present in the first edition. A great amount of information is given on the chapters on pharmacokinetics in both experimental animals and in patients. These chapters serve as a valuable resource to researchers in drug discovery. The concluding chapter by R. C. Moellering Jr. updated his view on the current and future roles of quinolones in the treatment of bacterial infections.

This volume is dedicated to the late John S. Wolfson who was the coeditor and well-known researcher on quinolone resistance and its clinical uses. George Y. Lester, a pioneer in the quinolone research, is also remembered in the "in memoriam" written by M. P. Wentland.

This reviewer found the volume to be outstanding, and many chapters are well-written with excellent proofreading. Literature references are comprehensive and up-to-date. However, discussion is absent for a few additional quinolones which are also under development in the chapter on veterinary use. This new edition is timely and informative and should serve as an excellent reference book for infectious disease specialists, clinical and basic microbiologists, pharmacologists, medicinal chemists, and other researchers active in quinolone research.

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The Steric Factor in Medicinal Chemistry. Dissymmetric Probes of Pharmacological Receptors. By Alan F. Casy with a contribution by George H. Dewar. Plenum Press, New York and London. 1993. xx + 570 pp. 17 × 25.5 cm. ISBN 0-306-44289-2. $125.00.

The stated aim of this book is to provide source material on stereochemical influences in medicinal chemistry and pharmacology. The first chapter presents a brief historical outline, and the more extensive second chapter summarizes relevant stereochemical definitions, nomenclature, and methodology as an "*aide-mémoire*" to the reader. Subsequent chapters address pharmacokinetics, adrenergic ligands, adrenoceptor antagonists, dopamine and dopaminergic ligands, dopamine antagonists. cholinergic agonists, muscarinic antagonists, ligands of nicotinic cholinergic receptors (written by George H. Dewar), histamine receptors, and 5-hydroxytryptamine ligands, and the final two chapters cover opioid ligands.

As stated in the Preface, no single book by a single author can present the entire field of stereochemical medicinal chemistry. The author has concentrated on neurotransmitters and opioid analgesics, subjects in which he has a special interest and a high level of expertise. These subject areas have been extensively studied, and they are admirably suited to discussion/exposition which permits stimulating speculation and perhaps some significant conclusions. It is appropriate (and essential) in a book of this sort that the stereochemical discussions make the pharmacology more meaningful and that the pharmacological presentations breathe life into the stereochemistry. The author has succeeded in blending chemistry and pharmacology into a cohesive entity, and he has again

demonstrated his ability to facilitate interpretation of combined stereochemical and pharmacological data. The chapters present a basis for understanding of the topic covered (even for the sophisticated reader), and they provide much food for thought regarding future directions in drug design.

The book is well-organized and well-written, and it provides enjoyable reading. Chapters are extensively referenced. Chemical structures and tables are well-drawn, and this reviewer noted very few typographical errors.

This book is highly recommended to practicing medicinal chemists and pharmacologists for its insightful interpretive discussions and as a source of a large body of specific literature-derived information. Moreover, it should be a useful textbook or ancillary resource for graduate students in medicinal chemistry, pharmacology, or pharmaceutics. It admirably compliments standard texts/reference works in "pure" stereochemistry.

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Antibiotics and Antiviral Compounds: Chemical Synthesis and Modification. Edited by Karsten Krohn, Herbert A. Kirst, and Hans Maag. VCH Publishers Inc., New York. 1993. 482 pp. 18 × 24 cm. ISBN 1-56081-745-3. DM *128.00.*

This book grew out of the Third International Conference on the Synthesis of Antibiotics held in Kloster Banz, Germany, in 1992. Speakers were requested to provide a concise review of the topic of their lecture. Each chapter is individually referenced, the most recent references being for 1992. Generally, adequate references to lead the interested reader to the primary literature are provided. Addresses are provided for all corresponding authors, and a cumulative subject index for the entire volume is included. In addition, a one paragraph summary precedes each chapter. A few chapters are marred with a bothersome number of typographical errors, but in most chapters there are relatively few mistakes.

As indicated by the title the focus of this volume is the synthesis of antibiotics. Most of the major areas of antibiotic research are covered and, in general, the authors have provided well-written personal accounts of research in their own laboratories. As such, however, these chapters are not intended to provide a comprehensive overview of an area. This compendium is comprised of seven section headings (New Methodology Applied to Antibiotic Synthesis; Macrolide Antibiotics; β-Lactames, Quinolones, and Cyclopentanoid Antibiotics; Peptides and Glycopepties; Enediyne Antibiotics; Carbohydrates in Antibiotic Synthesis; Antiviral Agents), each containing five to seven chapters.

In the first chapter, B. Trost reviews the use of palladium-catalyzed allylic substitution for the synthesis of carbocyclic analogues of carbohydrates and nucleosides, with particular emphasis on the application of the vicinal hydroxyamination and hydroxycarbation of allylic epoxides to a variety of targets. This is followed by chapters from R. Boeckmann and V. Snieckus on applications of [3,3] sigmatropic rearrangements for the preparation of medium ring oxepines and the combination of directed ortho metalation and palladium-catalyzed aryl–aryl coupling reactions for the construction of polyaromatic and heteroaromatic systems. The section on macrolide antibiotics includes two well-written chapters on the total synthesis of the erythronolides and a chapter on the lipopeptide 1,3-β-glucan synthesis inhibitors, the echinocandins. A welcome chapter on the chemistry of quinolones focuses on chemical advances within the last 3 years. Two chapters describe the mechanism of action and conformational analysis of cyclosporin and, to a lesser extent, FK-506. While these chapters are somewhat outside the mainstream of this volume, the second chapter in particular provides a useful case study of two receptor ligands where the conformation of the molecules in free solution is altered when bound to their biological receptors. The implications for drug design are clear. Returning to organic synthesis, another noteworthy chapter focuses on general methodology for the synthesis of glycopeptides. In particular, the usefulness of the FMOC and allylic protecting groups and the use of an azido functionality to mask an anomeric amine are described and applied to the synthesis of a partial structure of a leukemia virus envelope protein and a β-mannoside chitobiose conjugate. The following section on enediyne antibiotics contains two chapters directed toward the total synthesis of naturally occurring enediynes and an interesting third chapter directed more toward the design of novel DNA cleaving molecules. The section on carbohydrate chemistry contains chapters on the synthesis of C-glycosides and carba and aza sugars, the synthesis of aza sugars from α-amino aldehydes via the hetero Diels–Alder reaction, and the synthesis of sugar lactones and their use in the synthesis of highly functionalized carbacycles and heterocycles. Another interesting chapter in this section delineates the stepwise degradation of the complex lipopentasaccharide transglycosalase inhibitor monoenomycin A to a biologically active lipodisaccharide. In the final section on antiviral agents the design and synthesis of a variety of nucleoside analogues as reverse transcriptase inhibitors is described in four chapters, and the compendium concludes with a perspective chapter on the potential for the development of selective therapy with antisense and triple helix forming oligonucleotides.

From the above description one can see that this volume contains a wealth of organic chemistry as applied to the synthesis of antiinfective agents. Without question this compendium would be a useful aquisition for research libraries. While I suspect that this book will have limited appeal to the medicinal chemistry community as a whole, researchers actively engaged in the synthesis of antibiotics and antivirals may find this a welcome addition to their collections.

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Handbook of Receptors and Channels. G Protein-Coupled Receptors. By Stephen J. Peroutka. CRC Press. Boca Raton, FL. 335 pp. 18 × 26 cm. ISBN 0-8493-8321-8. $110.

Receptors and Channels represents the first volume of what will be at least a two-volume series of handbooks published by CRC (Volume Two is *Ligand- and Voltage-Gated Ion Channels*, R. Alan North). Each edition represents an attempt to catalog the complete amino acid sequence information on all cloned receptors within a given "superfamily" of molecule structure. This information is compared across species and coupled with synopses of the known pharmacology of each clone. Particular emphasis is placed on identifying interspecies differences in receptor pharmacology.

In most respects, *Receptors* achieves its stated goals. Coverage of G-protein receptors is comprehensive, and each of 16 chapters is replete with multiple pages of sequence information. Many of the authors also provide phylogenetical analyses, and the accompanying discussion of species differences in molecular structure is more than adequate. On the other hand, in trying to be as comprehensive as possible, several of the chapters have reduced information to one-line subsections (e.g., "the cDNA sequence for the rat TSH receptor was isolated by homology screening by Akamizu et al. (1990a)."") which are of somewhat limited use to the reader. Discussions of receptor pharmacology and species differences in pharmacology are generally brief (or absent) and are embedded in the general text rather than consolidated into separate chapter sections.

By way of specifics, the 16 chapters range in length from 6 (opioid) to 44 (hormone) pages. Figures are generally limited to sequence maps and phylogenetic trees although the obligatory "seven transmembrane domain" cartoon appears on a more-than-one occasion. The references are current (through 1993), fully-cited, and completely adequate to the material (this is a strength of the work).

In summary, *Receptors* is truly a CRC handbook. If one feels a need to have sequence information immediately available, it is more than worth the $110 price. On the other hand, the same information is readily accessed in GeneBank or EMBL. Given the pace at which newly-identified receptor clones are introduced, it is unfortunate the book is already dated in some respects.

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The Chemistry of Organophosphorus Compounds. Volume 3. Phosphonium Salts, Ylides and Phosphoranes. Edited by Frank R. Hartley. John Wiley & Sons, New York. 1994. xvi + 442 pp. 15 × 23.5 cm. ISBN 0-471-93057-1. $395.00.

This is a member of The Chemistry of Functional Groups series; it is the third of a four-volume set devoted to organophosphorus compounds. In this volume various aspects of the chemistry of phosphonium salts, phosphonium ylides, and phosphoranes are covered in seven chapters. These are entitled: (1) structure and bonding in phosphonium ylides, salts and phosphoranes, (2) preparation, properties and reactions of phosphonium salts, (3) preparation, properties and reactions of phosphoranes, (4) structure, bonding and spectroscopic properties of phosphonium ylides, (5) electrochemistry of ylides, phosphoranes and phosphonium salts, (6) photochemistry of phosphonium salts, phosphoranes and ylides, and (7) chemical analysis of organophosphorus compounds. Comprehensive author and subject indexes are included. In general, the chapters are not encyclopedic, but concentrate on the most significant recent developments and on material that is not treated in depth by reviews or other secondary sources. Thus, the address of the topics is intended for fairly advanced chemists.

This volume, together with others in the series, presents valuable current, state-of-the-art, specialized information. Library access is recommended.

Staff

Books of Interest

Destruction of Hazardous Chemicals in the Laboratory. 2nd Edition. By George Lunn and Eric B. Sansone. John Wiley & Sons, Inc., New York. 1994. xiii + 501 pp. 16 × 24 cm. ISBN 0-471-57399-X. $79.95.

New Drug Development: A Regulatory Overview. Revised Third Edition. By Mark Mathieu. Parexel International Corporation, Waltham, MA. 1994. ix + 328 pp. 16 × 23.5 cm. ISBN 1-882615-01-8. $125.00.

Anticancer Drugs from Animals, Plants, and Microorganisms. By George R. Pettit, Fiona Hogan Pierson, and Cherry L. Herald. John Wiley & Sons, Inc., New York. 1994. xii + 670 pp. 18.5 × 25.5 cm. ISBN 0-471-03657-9. $89.95.

Design and Analysis of Experiments. Volume 1: Introduction to Experimental Design. By Klaus-Hinkelmann and Oscar Kempthorne. John Wiley & Sons, Inc., New York. 1994. xvi + 495 pp. 16 × 24 cm. ISBN 0-471-55178-3. $59.95.

Aromaticity and Antiaromaticity. Electronic and Structural Aspects. By Vladimir I. Minkin, Mikhail N. Glukhovtsev, and Boris Ya. Simkin. John Wiley & Sons, Inc., New York. 1994. xiii + 313 pp. 16 × 24 cm. ISBN 0-471-59382-6. $69.95.

Second Supplements to the 2nd Edition of Rodd's Chemistry of Carbon Compounds. Volume II. Alicyclic Compounds. Part B. Six-and Higher-Membered Monocarbocyclic Compounds (Partial: Chapters 6–8 in this volume). Part C: Polycarbocyclic Compounds Excluding Steroids. Part D and E: Steroids. Edited by M. Sainbury. Elsevier Science B. V., The Netherlands. 1994. xx + 646 pp. 16 × 23 cm. ISBN 0-444-81483-3. $377.00.

Catalytic Asymmetric Synthesis. Edited by Iwao Ojima. VCH Publishers, Inc., New York. 1993. xiii + 476 pp. 16 × 23.5 cm. ISBN 1-56081-532-9. $110.00.

McGraw-Hill Dictionary of Scientific and Technical Terms. Fifth Edition. Edited by Sybil P. Parker. McGraw-Hill, Inc., New York. 1994. xvii + 2242 pp. 21.5 × 28 cm. ISBN 0-07-042333-4. $110.50.

Reviews in Computational Chemistry. Volume 4. Edited by Kenny B. Lipkowitz and Donald B. Boyd. VCH Publishers, Inc., New York. 1993. xix + 280 pp. 15.5 × 23.5 cm. ISBN 1-56081-620-1. $79.00.

Proteolysis and Protein Turnover. Edited by J. S. Bond and A. J. Barrett. Portland Press Ltd., U.K. 1993. xx + 274 pp. 17 × 24 cm. ISBN 1-85578-041-0. $65.00.

Neurochemistry of Drug Dependence. Biochemical Society Symposium 59 held at Royal Free Hospital, London, December 1992. Edited by S. Wonnacott and G. G. Lunt. Portland Press Ltd., U.K. 1993. vii + 216 pp. 16 × 25 cm. ISBN 1-85578-034-8. $45.00.

Genes V. By Benjamin Lewin. Oxford University Press, New York. 1993. xxiv + 1272 pp. 22 × 28 cm. ISBN 0-19-854287-9. $65.00.

Introduction to In Vitro Cytotoxicology. Mechanisms and Methods. By Frank A. Barile. CRC Press, Inc., Boca Raton, FL. 1994. 222 pp. 16 × 24 cm. ISBN 0-8493-8659-4. $95.00.

Mass Spectrometry. Clinical and Biomedical Applications. Volume 2. Edited by Dominic M. Desiderio. Plenum Publishing Corporation, New York. 1994. xv + 269 pp. 15.5 × 23 cm. ISBN 0-306-44455-0. $69.50.

Handbook on Metals in Clinical and Analytical Chemistry. Edited by Hans G. Seiler, Astrid Sigel, and Helmut Sigel. Marcel Dekker, Inc., New York. 1993. xx + 753 pp. 18 × 25.5 cm. ISBN 0-8247-9094-4. $195.00.

NMR of Macromolecules. A Practical Approach. Edited by G. C. K. Roberts. Oxford University Press, New York. 1993. xviii + 399 pp. 15.5 × 23 cm. ISBN 0-19-963224-3. $47.00.