Book Reviews

Principles of Medicinal Chemistry, Third Edition. Edited by William O. Foye. Lea & Fibiger, Philadelphia, PA. 1989. xiii + 925 pp. 18 × 27 cm. ISBN 0-8121-1098-6. $49.50.

This third edition of *Principles of Medicinal Chemistry* consists of 42 chapters plus an appendix pK_a Values of Drug Substances and pH Values of Tissue Fluids and a comprehensive index. The chapters deal with the mechanisms of drug actions, explained from the multiple perspectives of biochemistry, pharmacology, molecular, and medicinal chemistry. The 51 contributors are uniformly experts in their fields and have addressed various drug classes and methodologies in a clear, reasonably detailed fashion with numerous references and "suggested readings". The third edition follows the same general arrangement and classification of drugs used in the previous edition. Each drug class is discussed in terms of the actions of a few typical examples with related substances presented in tabular form.

New topics added to this edition are antilipidemic agents, antihormones, photochemistry, and molecular graphics. Many of the other chapters have been significantly updated and expanded. This extremely carefully prepared edition is reasonably priced. It is clearly suitable for use for students of pharmacy, chemistry, and medicine. All medicinal chemists will probably want to have their own copy of this definitive and readable account of drugs, their biological activities, and structure–activity relationships.

Staff

Neuromethods. 7. Lipids and Related Compounds. Edited by Alan A. Boulton, Glen B. Baker, and Lloyd A. Horrocks. Humana Press, Clifton, NJ. xx + 343 pp. 15 × 23 cm. ISBN 0-89603-124-1. $64.50.

Lipids, the major components of nervous system membranes, are the topic of this latest volume of Boulton and Baker's *Neuromethods* series. Glycolipids are found in particularly high concentrations in the central nervous system. More recently the functional and pathological importance of lipids, such as diacylglycerols, polyphosphoinositides, prostaglandins, leukotrienes, docosahexaenoic acid, platelet activating factor, and gangliosides, have received increased research scrutiny. As a result, many new methods have been developed. This volume considers major developments in the methodologies used in studying CNS lipids with suggestions concerning the selection of a method for a particular purpose.

Those involved in the neurosciences or lipid research will find this book an essential state-of-the-art desk and laboratory companion. For less specialized medicinal chemists library access will suffice.

Staff

Advances in Clinical Enzymology. Volume 6. Enzymes—Tools and Targets. Edited by D. M. Goldberg, D. W. Moss, E. Schmidt, and F. W. Schmidt. 1988. viii + 272 pp. 17.5 × 24.5 cm. ISBN 3-8055-4688-2. $184.00.

This book is a compilation of presentations made at the Proceedings of the 6th International Congress on Clinical Enzymology in Hanover, Germany, in September 1987. Current views and recent research expanding the knowledge of factors governing the transfer of enzymes from the intracellular to the intravascular compartments and their clearance from the circulation are reviewed. Some papers on physiological and pathological processes, such as infection, inflammation, limited proteolysis as a regulatory principle, and enzymes as targets for chemotherapy, not traditionally considered within the scope of clinical enzymology are also included. Following the John Henry Wikinson Award Lecture by G. Weber, Principles of Enzyme-Pattern-Targeted Chemotherapy in Human Leukaemia, the book is divided into five sections, namely, Evolution, Molecular Biology and Genetics; Enzyme Release, Distribution and Elimination; Limited Proteolysis as a Regulatory Principle; and Diagnostic Enzymology in Man and Animals. Each of these consist of four to seven more specialized papers.

An adequate subject, but no author, index is included. Overall, a broad range of topics related to clinical enzymology are addressed; however, primary interest in the book will probably be restricted to specialists in the field.

Staff

Advances in Heterocyclic Chemistry. Volume 44. Edited by Alan R. Katritzky. Academic Press, San Diego. 1988. vii + 396 pp. 16 × 23.5 cm. ISBN 0-12-020644-7. $85.00.

This volume, which continues an ongoing series that has served heterocyclic chemists well for a number of years, is composed of four chapters. The first, entitled Advances in the Chichibabin Reaction by C. K. McGill and A. Rappa, is a meaningful presentation of the reaction that involves the amination of nitrogen heterocycles by the displacement of a hydride by ammonia or an amine-derived nucleophile.

Chapter 2 is written by V. J. Arán, P. Goya, and C. Ochoa and deals with 1,2,6-thiadiazine 1,1-dioxides, 1,2,5-thiadiazole 1,1-dioxides and related 3–9-membered ring systems (including fused) under the title of Heterocycles Containing the Sulfamide Moiety. The chapter is laboriously thorough and not as useful for the practicing heterocyclic chemist as is the following chapter, Regioselective Substitution in Aromatic Six-Membered Nitrogen Heterocycles by D. L. Comins and S. O'Connor, which covers the period of 1982 to June 1987. Many of the examples given in the latter chapter are not only of practical significance but also provide interesting insight into the reactivity properties of mono-, di-, tri-, and tetraaza six-membered heterocycles.

The final chapter is probably the one of greatest general interest: The Literature of Heterocyclic Chemistry, Part III, by L. I. Belen'kii. This chapter is a sequel to similar compilations by Professor Katritzky that also appeared in *Advances* (1966 and 1979). The literature covered in the present chapter is 1979–1986 and is arranged in such a way that a particular subject is readily found by the researcher.

Chapters 1, 3, and 4 are useful additions to the heterocyclic chemistry review literature. It should be noted, however, that, due to the large number of review publications now in existence in the chemical literature, the *Advances in Heterocyclic Chemistry* series is not serving the role it once did, particularly at $85.00, which is the price for volume 44.

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Methods in Molecular Biology. Volume 4. New Nucleic Acid Techniques. Edited by John M. Walker. The Humana Press Inc., Clifton, NJ. 1988. xvi + 560 pp. 16 × 23.5 cm. ISBN 0-89603-127-6. $49.50.

Recent staggering advances in molecular biology have led to a significant growth in the development of experimental methodology in DNA technology. Walker's fourth volume of his renowned *Methods in Molecular Biology* has elegantly distilled the experimental section of the literature by providing every possible detail an expermentalist needs in this rapidly growing area of "genetic engineering". This volume focuses on nucleic acid techniques in 44 chapters of varying length, ranging from 4 to

36 pages (e.g., Chapter 11, Computer Applications to Molecular Biology: DNA Sequences, pp 103–138; Chapter 32, Luminescent Detection of Specific DNA Sequences, pp 421–424). Each chapter has a brief introductory section, followed by detailed sections on "Materials" and "Methods". The depth of details in the latter two sections is extraordinary; one cannot go wrong in a given experiment if one follows each step described numerically. Perhaps, the value of each chapter is accentuated by the fourth section under "Notes" where the author(s) delineate precautions to be taken and how to solve common problems (e.g., what to do if some swollen agarose beads remain undissolved, p 8). The chapters on the isolation, purification, electrophoresis, and sequencing of DNA are written with clarity by authors who use these techniques routinely in their research activities. Equally valuable are the chapters on DNA probes and DNA libraries. The last 10 chapters in essence are devoted to RNA and DNA of plant origin.

Organic and medicinal chemists should appreciate two chapters on oligonucleotide synthesis via phosphoramidite and phosphotriester chemistries and the impact they have had in recent years toward the development of automatic DNA synthesizers. While going through this book, chemists will have no difficulty in discovering the frequent usage of a wide variety of acronyms by biologists, e.g., HSB for high-salt buffers (p 144), CPG for controlled pore glass (p 167), AMPS for ammoniumpersulfate, TEMED for *N,N,N′,N′*-tetramethylethylenediamine, etc. Although these acronyms are elaborated at their first use in each chapter, their subsequent frequent usage in a given chapter may frustrate chemists who are not familiar with this language. A glossary of all the acronyms as an appendix for quick reference could have alleviated this common shortcoming.

The book for all practical purposes is devoid of typographical errors except for two minor ones such as ex-traction (p 65) should be extraction and the sentence "A denaturing polyacrylamide gel electrophoresis system is described by Maxam and Gilbert(1) and in detail in Chapter" (p 75) should have stated Chapter(?).

In sum, Walker's *Method in Molecular Biology*, Volume 4, is an excellent recipe book in DNA technology and should serve as a valuable handbook for undergraduate, graduate students, and researchers in the laboratories engaged in molecular biology.

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The Quinolones. Edited by V. T. Andriole. Academic Press, San Diego. 1988. xii + 262 pp. 15.5 × 23.5 cm. ISBN 0-12-059515-X. $37.00.

This book is a timely publication on the quinolones and will provide the reader with basic information on the fundamental and clinical aspects of the new quinolones.

The introduction to this book by Norris and Mandell traces the historical development of the quinolones and gives an overview of their microbiological and clinical activity. The second chapter on the chemistry and mode-of-action by Smith and Lewin is a most thought-provoking chapter. The function of DNA gyrase and the consequence of its inhibition by the quinolones is discussed in detail and experimental evidence which had led to other mechanisms for bactericidal activity beside DNA gyrase inhibition are also presented. The requirement for protein synthesis for bactericidal activity of some quinolones and the differences between quinolones in their bactericidal activity against Gram-positive and Gram-negative bacteria are described. The frequency of resistance development and the different mechanisms by which bacteria can become resistant to the quinolones are discussed. Chemistry is limited to chemical structures of quinolones which have been approved for clinical use and a select few which are in clinical development. The comparative in vitro activity of quinolones in clinical use and of a few compounds in development is described by Phillips, King, and Shannon in Chapter 3. There is no discussion of structure–activity relationships. The reader will have to look elsewhere to find the chemical structures of three of the compounds described in this chapter. The deficiencies in the activities of the quinolones against some bacteria such as streptococci and anaerobes are described. The fourth chapter on the pharmacokinetics of the quinolones by Bergan describes the oral absorption, blood levels, tissue distribution, and metabolism of the clinically available quinolones in man. The influence of impaired renal and liver functions and of food are described, but the pharmacokinetics in laboratory animals of these compounds and those being developed and also structure–activity relationships pertaining to pharmacokinetics of the quinolones are not described. Clinical results obtained with the quinolones approved for human use are reviewed by Andriole in Chapter 5. The ability to use oral treatment for infections ranging from simple, uncomplicated urinary tract infections to more serious infections, such as osteomyelitis, is emphasized. The toxicity, adverse effects, and drug interactions assocated with the quinolones are described by Stahlmann and Lode in Chapter 6. Arthropathy seen in laboratory animals is considered in depth. The results of mutagenicity studies, reports of central nervous system side effects, and interactions of quinolones with agents such as theophylline, caffeine, and warfarin are reviewed. In the final chapter, Neu presents the clinical prospects of the quinolones and describes the criteria which new quinolones will have to meet.

In summary, this book will be useful for infectious disease specialists and those interested in keeping abreast of the field of antibacterial agents. This book is not intended to provide structure–activity relationships of the quinolones to medicinal chemists who are looking for guidance in making an even more active antibacterial agent.

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Chemistry of Heterocyclic Compounds. Edited by J. Kovāč and P. Zālupskỳ. Elsevier, Amsterdam, The Netherlands. 1988. xx + 600 pp. 17 × 24 cm. ISBN 0-444-98917-X. $223.75.

This is Volume 35 in the Studies in Organic Chemistry series; it gives an account of the Proceedings of the IXth Symposium on Chemistry of Heterocyclic Compounds held in Bratislava, Czechoslovakia, August 23–28, 1987. In general, the plenary lectures reflect current trends in the field of heterocyclic chemistry. In addition to presentations directed toward classical heterocyclic chemistry, some more general aspects, such as organic synthesis, synthesis with coenzyme models, physical organic chemistry, and structural features of heterocycle-containing natural compounds, are included. The majority of this book is devoted to accounts of short oral and poster communications covering a wide range of topics of such heterogeneity that subdivision into specialized areas was not undertaken. As a result, the book presents a great deal of information about the chemistry of heterocyclic compounds in a somewhat random fashion. This, coupled with the lack of subject index, results in the accumulation of a large amount of very difficultly accessible information. Thus, the value of the book is seriously diminished.

This book, as a consequence of the cited deficiencies, will be of interest to only those chemists specializing in the chemistry of heterocyclic compounds.

Staff

Progress in Medicinal Chemistry. Volume 25. Edited by G. P. Ellis and G. B. West. Elsevier, Amsterdam, The Netherlands. 1988. vii + 351 pp. 14 × 21 cm. ISBN 0-444-80965-1. $95.00.

This "milestone" volume of *Progress in Medicinal Chemistry* is comprised of six chapters. These are written by experts in the field. Specifically treated are (1) Cyclosporins, Fungal Metabolites with Immunosuppressive Activities; (2) Structural Aspects of Antineoplastic Agents—A New Approach; (3) Synthesis of Analogues of Folic Acid, Aminopterin and Methotrexate as Antitumor Agents; (4) New Benzimidazole Carbamates as Antifilarial Agents; (5) The Pharmacology of Vitamin E; and (6) Multivariate Data Analysis and Experimental Design in Biomedical Research. Each chapter is well-written, up-to-date, and thoroughly referenced.

The book concludes with a comprehensive index plus author and subject indices for Volumes 1–25.

This series is a must for all health sciences libraries. It will obviously be of greatest relevance to medicinal chemists involved in those areas specifically covered.

Staff

Natural Products Isolation. Edited by Gerald H. Wagman and Raymond Cooper. Elsevier, Amsterdam. 1989. xiii + 618 pp. 17 × 25 cm. ISBN 0-444-87147-0. $139.00.

This is an important book, and the editors as well as the 25 authors deserve to be congratulated. In 14 chapters, some of the most important recent advances in the isolation of natural products have been described in detail. Updated methods for the separation of antimicrobials, antivirals, and enzyme inhibitors from a variety of sources are presented. These methods include counter-current chromatography, liquid chromatography, HPLC, and affinity chromatography.

Chapter topics are as follows: (1) counter-current chromatography; (2) HPLC detection methods for microbial products in fermentation broth; (3) affinity and HPLC purification of glycopeptide antibiotics; (4) nikkomycin and polyoxin nucleoside peptide antibiotics; (5) saffamycin and isoquinoline antibiotics; (6) new cephalosporins from *Streptomyces*; (7) monocyclic β-lactams: the nocardicins and monobactams; (8) isolation of carbapenem antibiotics; (9) avermectins: powerful microbial metabolites active against parasitic infections; (10) bioactive compounds from marine organisms and cultivated blue–green algae (these include the didemnins, the bryostatins, the manoalides, the clavulones, the pseudopterosins, the eudistomins, okadaic acid, sceptrin, the hapalinodoles, the manzamines, the calyculins, tunichrome B-1, doridosine, jaspamide, and the anthopleurins; (11) interferons; (12) enzyme inhibitors produced by microorganisms (this chapter was written by the late Prof. H. Umezawa and completed by his son, Dr. Kazuo Umezawa); (13) alkaloidal glycosidase inhibitors from plants and microorganisms (these are usually of the piperidine or pyrrolidine types); (14) on the unusual topic of chemical communications and cell–cell recognitions in developing tissues.

Specific information on extraction, separation, and purification techniques is presented. Each chapter has an extensive bibliography, and where warranted an appendix listing sources of materials and equipment.

The importance of this book is in pointing out some of the more exciting directions in modern, natural products chemistry. It dramatizes the fundamental need for close cooperation between microbiologists and chemists to ensure that compounds of pharmacological importance are isolated and investigated.

A striking feature is that American academics are almost completely missing from the list of authors. This simply reflects the present overemphasis on total synthesis that is endemic in chemistry departments at American universities, at the expense of a more balanced approach which would include modern endeavors at compound isolation and structure elucidation as represented by the work described in this volume. It is to be hoped that the National Institutes of Health will rearrange its research grant priorities so as to obtain a more judicious equilibrium between the isolation and the synthesis of natural products. Such a reconsideration of priorities, which would also involve steps to encourage cooperation between natural product chemists and microbiologists, is long overdue.

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Biotechnologically Derived Medicinal Agents. The Scientific Basis of Their Regulation. Edited by John L. Gueriguian, Vittorio Fattorusso, and Duilio Poggiolini. Raven, New York. 1988. xii + 195 pp. 15 × 24 cm. ISBN 0-88167-428-1. $45.00.

This book represents the proceedings of a conference sponsored and organized by Interscience in Paris, September 1987. The focus is on the scientific and technological basis of biotechnologically derived drugs—used here for the most part to indicate protein products of genetic engineering (recombinant DNA technology) including those produced to provide active immunization schemes, monoclonal antibody products, and a variety of related products of biochemical engineering made possible by recent advances in cell and molecular biology. The purpose of the conference was to develop a consensus on the major aspects of regulatory control of these agents among academic, industrial, and government participants.

The book is divided into four sections. Eight contributions to the first section represent more than half of the text. These are "scientific presentations". In section two the current regulation of these drugs is described by representatives of the countries participating in the conference. In section three, two presentations discuss the "view of industry", while in section four, entitled Thematic Discussions, four issues are raised leaving the reader with a summary of incompletely resolved matters on the regulation of biotechnologically derived medicinal agents.

Many of the contributions in the first section provide unconnected experimental details that are unnecessary to the understanding of the major scientific issues. These major issues are considered in the first, fourth, seventh, and eighth contributions in section one. Nevertheless, the reader derives from this first section some sense of the specific problems encountered in the development and manufacture of biotechnologically derived medicinals. Thus, the subsequent discussions are clear.

The statement of conclusions at the end of some of the longer presentations and the occasional remarks under "comments and discussions" are useful. The latter suggested some spirited debate at the conference on issues which appear far from settled. As the number of biotechnologically derived products is still small, the regulatory agencies appear to be approaching each new agent on a case-by-case basis. However, as the number and complexity of such agents increase, a focus emerges in regard to their safe development. Some, it appears, would like a clear statement of what is required to bring one of these drugs to market. Others feel that a more flexible policy is required for the moment. The focus of the conference and the text appears to have been drawn finally to the ideas (1) that analytical and pharmacotoxicological testing requirements will be generally different for these agents even in comparison to nonrecombinant DNA produced biologicals, (2) that purification standards occasionally may be stringent especially when eukaryotic (especially mammalian) cell lines are employed in production, and (3) that immunogenic effects may need to be carefully evaluated. The eventual importance of this book may be in its synthesis and summary of ideas on the regulation of biotechnologically derived medicinal agents put forward at this early stage.

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Progress in Clinical and Biological Research. Volume 291. QSAR: Quantitative Structure–Activity Relationships in Drug Design. Edited by J. L. Fauchere. Alan R. Liss, New York. 1989. xxiv + 443 pp. 15 × 23 cm. ISBN 0-8541-5141-X. $85.00.

This is the Proceedings of the 7th European Symposium on QSAR held in Interlaken, Switzerland, September 5–9, 1988. It is truly remarkable that this book, which is composed of articles from more than 200 contributors, including the foremost authorities in the field, should be reviewed in less than 6 months following the meeting. These scientists have treated in detail the main quantitative approaches, including the most recent advances, to the design of new therapeutic agents. These descriptions of QSAR studies are covered in eight sections, namely, (I) QSAR: General Aspects; (II) Hydrophobicity (Lipophilicity): Concepts, Methodology, and New Values; (III) Applications of Multivariate Analysis; (IV) Advanced Techniques and Expert Systems in Computer-Aided Design; (V) Molecular Modelling and Graphics Systems; (VI) Peptide Drug Design; (VII) QSAR Applications in

Medicinal Chemistry; and (VIII) QSAR Applications in Non-Medicinal Areas. Each of the sections is treated in depth by experts in this rapidly expanding area of research. QSAR studies in medicinal chemistry cover such diverse drug classes as antibiotics, antimicrobials and fungicides, carcinogens and antineoplastic agents, analgesics, benzodiazepine and dopamine agonists, histamine agonists, and calcium channel blockers. Nonmedicinal applications of QSAR relative to olfaction, toxicology, and environmental sciences are presented. Other topics, such as comparative structure–activity relationships, surface area and hydrophobicity of small molecules, principal properties of aromatic substituents, logic-based methods for drug design, computer-aided peptide and protein engineering, combined QSAR and molecular graphic analysis of cholecystokinin inhibitors, conformational study of erythromycin analogues, and QSAR and pesticides design are also covered.

The book, which consists of "camera ready" presentations, is nicely organized. References are uniformly up-to-date. The author and subject indices are quite adequate. Clearly this book will be a valuable addition to the libraries of all medicinal chemists. It will also be of interest to physical and organic chemists, biochemists, enzymologists, and pharmacologists.

Staff

Receptor Pharmacology and Function. Edited by Michael Williams, Richard A. Glennon, and Pieter B. M. W. M. Timmermans. Marcel Dekker, New York. 1989. xv + 778 pp. 16 × 23.5 cm. ISBN 0-8247-7841-3. $150.00.

This is Volume 13 in the series of *Clinical Pharmacology* edited by Murray Weiner and is the outcome of a symposium held in 1985, sponsored by the American Society for Pharmacology and Experimental Therapeutics and the Medicinal Chemistry Division of the American Chemical Society. The volume is designed to present a factual and theoretical basis for the understanding of receptor function. In view of the fact that much of the recent advance in this area of knowledge, which has grown "exponentially" in the past two decades, has been derived from radioligand binding studies, both for receptor proteins and antigen–antibody interactions, determination of protein sequences and the ability to isolate fragments essential to receptor function, relation of the affector and messenger functions to receptor conformation and folding, and computerization techniques making these complex interactions realizable, the selection of authors for this volume was exceptionally good.

The first six chapters may be regarded as presenting the basic background of receptor concepts, and the remainder (16 chapters) are concerned with the present state of knowledge of individual receptors. The first chapter, by M. D. Hollenberg, is a particularly effective overview of receptors, acceptors, channels, and mechanisms of transmembrane signaling. The second, by M. Titeler, is concerned with receptor binding theory and methodology. The third, by G. A. McPherson, provides a mathematical approach to receptor characterization. Receptor-linked second messenger systems are discussed by W. J. Kinnier in the fourth chapter, and synthesis and handling of radioligands is presented by C. Filer, S. Hurt, and Y.-P. Wan in the fifth chapter. Molecular Modeling of Receptor-Ligand Interactions by Y. C. Martin and E. Danaher in the sixth chapter provides a lucid discussion of computer modeling of three-dimensional structures of ligand binding sites and ligand–receptor complexes.

The rest of the chapters present discussions of individual receptors that have been relatively well characterized. The texts include historical surveys; classification of receptors; the nature of agonists and antagonists; distribution, localization, and function of the receptors; binding studies; pathophysiological and drug-induced alterations; hormonal regulation; and usually future perspectives. The specific receptors discussed include the following: α- and β-adrenoceptors; central serotonin and histamine receptors; GABA and benzodiazapine receptors; receptors for excitatory amino acids; cholinergic, purine, and peptide receptors; opioid and eicosanoid receptors; tetrahydrocannabinol, phencyclidine, and tricyclic antidepressant receptors; calcium channels and their receptor sites; and dopamine receptors. Another chapter takes up intact cells as a model for studying receptor binding and function.

The volume should be of great value to chemists and biologists knowledgeable in the field, particularly to those concerned with the discovery of new therapeutic substances. The structures and figures are clearly delineated, the chapters are well referenced, and there is a fair amount of tabulation of data. The editors and authors are commended for a most useful sourcebook, and one that provides a good foundation for understanding the present development of this rapidly growing area of research.

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The Alpha-2 Adrenergic Receptors. Edited by Lee E. Limbird. Humana Press, Clifton, NJ. 1988. xi + 367 pp. 15.5 × 24 cm. ISBN 0-89603-135-7. $69.50.

This book describing various aspects of regulation, isolation, and biochemistry associated with the α-2 adrenergic receptor is a welcome addition. Like its predecessor on the α-1 adrenergic receptor, this book should prove to be a valuable resource for both the medicinal chemist and the pharmacologist.

The book is divided into six main sections, each containing one or more chapters which are further subdivided into specialized topics. Starting with historical perspectives and ending with future vistas, the intermediate sections on characterization of the receptor and its binding site, containing the chapter on biochemistry of the α-2 adrenergic receptor, on biochemical mechanisms of receptor action, which contains the chapter on inhibition of adenylate cyclase, on correlation of receptor binding and function, containing chapters describing structure–activity relationships for α-2 agonists and antagonists and functions mediated by α-2 receptors, and finally on receptor regulation provide a good basis for an in-depth understanding of α-2 adrenergic receptor mediated functions. The subtopics in each chapter are broken down in a manner allowing for ready access of the material contained within the chapters.

The major criticism associated with the book is the usual time delays associated with placing together a volume of this type. The book describes the field quite adequately through 1985 and early 1986. However, considering the plethora of information published since then on the α-2 adrenergic receptors (especially pertaining to the molecular biological information), the book will quickly become outdated. In spite of this shortcoming, I recommend this book for those active in the field. For those with only a casual interest, the cost does not warrant the purchase. However, the book is recommended as a library holding in both the industrial setting as well as academia where there are medicinal chemists and pharmacologists.

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Essentials of Medicinal Chemistry. Second Edition. By Andrejus Korolkovas. John Wiley & Sons, Inc., New York. 1988. xii + 1204 pp. 19 × 26 cm. ISBN 0-2171-88356-5. $125.00.

This book was written primarily for use as a medicinal chemistry textbook and for use in pharmacy and chemistry courses. It is also an invaluable reference source of information for professionals involved in medical fields such as dentistry, nursing, veterinary medicine, and pharmacology.

This work is comprised of 22 chapters and is arranged in 7 sections. The chapters are well referenced with current literature often cited. The first section, which encompasses three chapters, covers the basic fundamentals of medicinal chemistry and the theoretical development and action of drugs. The remaining 19 chapters cover many of the different pharmacological classifications of drugs as considered by the World Health Organization such as psychopharmacological, pharmacodynamic, and chemotherapeutic agents, drugs for metabolic diseases and endocrine

function, vitamins and hormones, and miscellaneous agents. The book mentions most of the 5000 drugs on the market in addition to many of the new drugs that are currently under investigation. Contained in the individual chapters that cover the various drug types used in therapeutics are sections on history, mechanism of action, therapeutic use, biotransformation, bioavailability, dosage, storage, and synthesis of representative examples.

This book should be of significant interest to medicinal chemists and other scientists both as a textbook and reference source.

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Chemical Carcinogens. Edited by P. Politzer and F. J. Martin, Jr. Elsevier, New York. 1988. xiv + 366 pp. 17 × 25 cm. ISBN 0-444-43008-3. $147.25.

This book provides 15 chapters, each of which is a review, of current topics in chemical carcinogenesis. As the editors admit in the preface, the topics are diverse, covering not only a variety of chemicals, but also chemical, physical, and biological studies of these chemicals. The major strength of the book is that internationally recognized cancer researchers have contributed the chapters and written high quality reviews that both introduce the topic for the general reader and also summarize the latest developments for the specialist. Most of the chapters have bibliographies exceeding 100 references so the reader has the opportunity to gain a significant perspective of the current status of chemical carcinogens. The book begins with three general reviews of DNA adducts emphasizing metabolism and polyaromatic hydrocarbons, but also covering epoxides, nitrogen mustards, and cisplatin. Following are chapters mostly on several specific classes of carcinogens: halogenated aliphatics, chloroethers, ethylene derivatives, epoxides, *N*-nitroso compounds, nitropolyaromatics, estrogens, and methylated polyaromatics (especially the importance of methyl bay region diol epoxide structures). Also there are chapters on irregularities of DNA structure, the k_e carcinogens-screening test (chemical carcinogens that covalently attack DNA, as most of them do, are electrophilic, so a measure of the electron attachment rate constant, k_e, of chemicals is a way to screen them for carcinogenicity) and (where was I) microfluorescence as a technique for studying cell organelle activities in response to carcinogens. Anyone interested in the mechanisms of chemical carcinogenesis will find this to be a valuable book.

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Computer-Aided Drug Design. Methods and Applications. Edited by Thomas J. Perun and C. L. Propst. Marcel Dekker, New York. 1989. xii + 493 pp. 15.5 × 23.5 cm. ISBN 0-8247-8037-X. $99.75.

The book, as stated by the authors in their preface, has been written to provide an overview of the process of mechanistic, computer-aided drug design. The process begins with considerable knowledge of the enzyme or receptor targets of substrates or ligands. This knowledge is based to a considerable extent upon information gathered from spectroscopy NMR, enzyme kinetic evaluation, and other techniques. Descriptions of these methods are collected into six initial chapters under a methods label. The latter half of the book is made up of six applications chapters.

Following a good introductory chapter by the editors, a chapter on computer graphics reveals much about current technology, methods, and software. This is followed by a description of molecular mechanics and molecular dynamics. The chapter on X-ray crystallography in drug design presents this important topic in a clear thorough manner. NMR is described in its role in conformation analysis, interactions, and enzyme reactions in the next chapter. Completing the methods half of the book is a chapter on enzyme kinetics and its role in structure–activity studies.

The second half of the book, dealing with applications, begins with a chapter on computer-aided design of angiotensin-converting enzyme inhibitors. This is followed by chapters on the design of inhibitors of renin and dihydrofolate reductase. A chapter on approaches to antiviral drug design looks into this new area. A chapter on the design of conformationally constrained opioid peptides focuses on a dynamic area of research. The final chapter deals with the design of inhibitors of collate uptake of hepatocytes.

The book is well constructed in terms of the mix of chapters and the quality of the scholarship in each. A number of color plates add value to the discussions.

The book should be in the libraries of academic or industrial departments with any activity in drug design. It should be in libraries of individuals directly involved in research in any of these areas.

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Principles and Methods of Toxicology. Second Edition. Edited by A. Wallace Hayes. 1989. Raven, New York. xiii + 929 pp. 21 × 28.5 cm. ISBN 0-88167-439-7. $79.00.

This second edition of *Principles and Methods of Toxicology* has been expanded to add a more systematic approach to toxicology without losing the methodological basis of the first edition. The present volume describes current testing procedures, provides useful guidelines on data interpretation, and accentuates major areas of controversy. The book is intended to be sufficiently simple for use as a textbook in graduate teaching. It has been organized to facilitate this objective. Thus, the first section treats basic toxicologic principles and the philosophies that led to these testing strategies. The second section deals with basic toxicologic testing methods and includes most of the testing procedures now required to meet regulatory standards. The third section describes specific organ systems and contains chapters on kinetics and effects on cellular organelles and target organs. A state-of-the-art approach is emphasized. Each chapter is sufficiently detailed to permit performance of an experiment or testing of a protocol and also provides insight into the rationale for the experiment.

This book that deals with the study of the harmful actions of chemicals on biologic tissues is a useful text for introductory courses in toxicology. It will also be of interest as a review for the practicing toxicologist. Medicinal chemists will find it of value as a reference source.

Staff

Selenium in Biology and Medicine. Edited by J. Nêve and A. Favier. Walter de Gruyter, Berlin. 1989. xix + 411 pp. 17 × 24 cm. ISBN 3-11-011770-3. $290.00.

This book collects the lectures given at a symposium held at Avoriaz, in the French Alps, in March 1988 where, to quote from the Preface "numerous winter sport possibilities together with weather varying from beautiful to abominable harmoniously tempered the intense scientific work of the participants".

In reviewing this work, it should be noted that the title is misleading since this volume, by and large, is not a review of important recent work dealing with the biology and medicine of selenium but rather presents a collection of seminars dealing, with several exceptions, with very specialized and—sometimes—statistically dubious studies in this field.

The book is organized into the following sections: Selenium Intake, Metabolism and Homeostasis; Biological Functions of Selenium; Assessment of Selenium Status; Selenium in Human Diseases; Selenium Supplementation and Toxicity; Selenium in Animals. Subjects covered range from those as abstruse as studies of selenium in wine, selenium metabolism and availability in rainbow trout, serum selenium in alcoholic diseases, and selenium in marine waders to dozens of other topics, and a few reviews trying to summarize recent developments in this interesting research field.

We have had a recent explosion of research in the areas of selenium chemistry and selenium biochemistry. The discovery of selenium-containing enzymes such as glutathione peroxidase and glycine reductase coupled with the advancement of selenium, in the public mind, from a toxic element to be feared to a beneficial element to be sought in health-food stores has greatly expanded interest in selenium research. Claims have been made that "selenium may prevent cancer (a very old idea, incidentally) and that it may stimulate the immune apparatus". Either an excess or a lack of selenium may have unfortunate results in animals including humans. In view of all this, it is not surprising that a lot of basic and clinical research involving selenium is being carried out. The present book presents a rather uncritical selection of such research in several (mainly European) laboratories. Any reader interested in recent progress in selenium research will find some work of interest within this volume. However, in view of the high price and the wide range in the quality of the papers presented, purchase of this book can be recommended only to dedicated selenium enthusiasts.

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Basic Neurochemistry. Molecular, Cellular, and Medical Aspects. Fourth Edition. Edited by George J. Siegel, Bernard W. Agranoff, R. Wayne Albers, and Perry B. Molinoff. Raven Press, New York. 1988. xviii + 984 pp. 19 × 24 cm. ISBN 0-88167-343-9. $55.00.

The phrase "Molecular, Cellular, and Medical Aspects" has been added to the fourth edition of this classic book first published in 1972. It derives from the editors' belief that neurochemistry is flourishing because of the observations among various levels. This edition is practically a new book. More than half of the chapters appear for the first time, and the others have been extensively revised to reflect the many significant new developments in neurobiology. The book is divided into six parts: (1) Neural Membranes, (2) Synaptic Function, (3) Molecular Neurobiology, (4) Cellular Neurochemistry, (5) Medical Neurochemistry, and (6) Behavioral Neurochemistry. Each part consists of a number of more specialized chapters written by experts in the particular area. The new section on molecular neurobiology describes molecular mechanisms, applications of nucleic acid probes for gene expression, and molecular approaches to the elucidation of inherited diseases of the nervous system. New chapters in other sections are devoted toward molecular structures and mechanisms of membrane channels, neurotransmitter receptors, receptor-activated phosphoinosotide turnover, G-proteins, cyclic nucleotides, and phosphorylation in regulation of neuronal signaling functions. Other new chapters include ones on the molecular structure and dynamics of the cytoskeleton of the cell and biochemical changes in brain development, regeneration, plasticity, and aging, i.e., topics important to the understanding of neuronal growth, neuropsychiatric disease, biologic repair mechanisms, and other treatment strategies such as tissue transplantation.

Basic Neurochemistry is a very thorough treatment of molecular genetics and neurobiology. It is clearly written with current references, along with complete author and subject indices. It is recommended for all scientists involved with CNS research. In addition, the editors clearly achieved one of their objectives, i.e., to make available such a massive treatise at a modest price.

Staff

McGraw-Hill Concise Encyclopedia of Science and Technology, Second Edition. Edited by Sybil P. Parker. McGraw-Hill, New York. 1989. 1xxvii + 2222 pp. 21 × 28 cm. ISBN 0-07-045512-0. $110.00.

This is the second edition of this widely acclaimed encyclopedia of science and technology. It is a completely up-to-date, authoritative reference in a convenient one-volume format. In this extensively revised and updated second edition is presented current accurate information on the key concepts and issues in more than 75 major areas of science and technology, including such topics as expert systems, Alzheimer's disease, high-energy physics, AIDS, and medical imaging. The 7700 articles in this encyclopedia have been extracted from the articles in the sixth edition of the 20-volume encyclopedia set published in 1987. The articles have been carefully condensed to ensure full coverage of each topic while retaining the substance and clarity of the parent encyclopedia. The index contains more than 30000 entries.

This compact, readable, basic science reference is recommended not only for academic but also for public and school libraries.

Staff