Book Reviews

Enzyme Chemistry. Impact and Applications. Second Edition. Edited by Colin J. Suckling. Chapman and Hall, London. 1990. xii + 383 pp. 16 × 24 cm. ISBN 0-412-34970-1. $79.95.

This second edition of *Enzyme Chemistry, Impact and Applications* is a result of the impact of rapid progress in biotechnologies such as genetic engineering, site specific mutagenesis, and catalytic antibodies as well as their industrial applications on enzymology in general and enzyme chemistry in particular. Hence, in the second edition, the scope of the book is extended to cover the above developments while still retaining the overall aims of the first edition.

There are nine well-written chapters with good bibliographies in the book and, as before, they are written by experts and leading investigators in the field. Several of these chapters are completely rewritten to accommodate the recent developments mentioned above and a new chapter on enzymes in food industry is included to cover the breadth of applications of enzyme chemistry. The first three chapters offer good coverage of how enzymes work and chemical models of their cofactors. In chapter 4 selectivity of enzymes and chemicals are compared. Their application in biomimetic reactions and the usefulness of catalytic antibodies are also described here. In addition, this chapter includes a great deal of useful information and briefly covers advances in protein chemistry and molecular biology. For organic chemists with a good understanding of reaction mechanisms and medicinal chemistry, chapter 5 discusses enzymes as targets for drug design. In the rest of the chapters, the role of metal ions in enzymology and the role of enzymes in biosynthesis are discussed. Chapter 9 is specifically included to provide some insights into protein chemistry and enzymology.

The book on the whole is useful for advanced students of bioorganic chemistry, biochemistry and medicinal chemistry. Although it has no author index, it has good subject index. It is well-bound and the price is reasonable.

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Receptor Purification. Volume 1. Receptors for CNS Agents, Growth Factors, Hormones, and Related Substances. Volume 2. Receptors for Steroid Hormones, Thyroid Hormones, Water-Balancing Hormones, and Others. Edited by Gerald Litwack. Humana Press, Inc., Clifton, NJ. 1990. xiii + 501 pp (Vol. 1). xiii + 417 pp (Vol. 2). 19 × 26 cm. ISBN 0-89603-167-5 (Vol. 1); 0-89603-183-7 (Vol. 2). $89.50 (each volume).

Receptor Purification is a unique, practical two-volume guide to the purification of most receptor types. It provides a comprehensive source of techniques that enable the purification of both cloned receptors and receptors from cells and tissues. From the techniques that are described researchers should be able to select the best approaches to a purification problem.

In the two volumes there are contributions from leaders in the field of purification and phenomenology of receptors. In volume 1 there are contributions on serotonin receptors, adrenergic receptors, the purification of GTP-binding proteins, opioid receptors, neurotensin receptor, luteinizing hormone receptor, human chorionic gonadotropin receptor, prolactin receptor, epidermal growth factor receptor, colony stimulating factor receptor, insulin-like growth factor receptors, insulin receptor, fibronectin receptor, interferon receptor, and the cholecystokinin receptor. In volume 2 there are contributions on dexamethasone mesylate, dexamethasone-biotin affinity probes, the purification of different forms of the glucocorticoid receptor, the mineralocorticoid receptor, the androgen receptor, the estrogen receptor, the progesterone receptor, the vitamin D receptor, the retinoic acid binding protein, thyroid hormone receptor, vasopressin VI receptor, prostaglandin E1/prostacyclin receptors, angiotensin II receptor, asialoglycoprotein receptor, and receptors of bacterial chemotaxis. The information about purification of each receptor is sufficiently complete so that the process can be followed without additional information from the literature. In some cases there are contributions about specific agents that are useful for covalent binding of ligands to their receptors. Moreover, considerable cloning information that might be useful to investigators considering overexpression systems is presented. Each section is thoroughly referenced and both volumes have an adequate subject index.

This two-volume set provides valuable information for all scientists involved in receptor research. It will serve as an excellent laboratory resource for biologists, biochemists, and molecular biologists involved in protein or receptor purification.

Staff

Nitric Oxide from L-Arginine: A Bioregulatory System. Edited by S. Moncada and E. A. Higgs. Excerpta Medica, Amsterdam. 1990. ix + 512 pp. 17 × 24.5 cm. ISBN 0-444-81154-0. Dfl. 340.

This book describes research activities in the rapidly developing area of biochemistry and pharmacology of nitric oxide and was developed on the basis of the proceedings of an international symposium held at the Royal Society, London, September 14–15, 1989. There are 61 well-written chapters by leading and active researchers in the book. The first section, which comprises 39 chapters, deals with the role of nitric oxide in the endothelium, brain, and other target organs including tumor cells. The second section details 14 posters presented at the symposium, and the third section is comprised of eight chapters and deals with current topics in the area of nitric oxide research. The book is well-indexed and has both subject and the author indexes. Although there is some overlap, this book has a wealth of useful information and references for pharmacologists, biochemists, and medicinal chemists concerned with this area of research. The binding is sturdy and the price of the book seems reasonable.

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Guide to Clinical Trials. By Bert Spilker. Raven Press, New York. 1991. xxv + 1156 pp. 23 × 29 cm. ISBN 0-88167-767-1. $130.00.

Dr. Bert Spilker is well-known for his excellent series of "how to" books on clinical research. His experience in the field, both with pharmaceutical companies and as a consultant, has resulted in the trilogy *Guide to Clinical Studies and Developing Protocols*, *Guide to Clinical Interpretation of Data*, and *Guide to Planning and Managing Multiple Clinical Studies*. These are to be found on the library shelves, or more likely on the desks, in clinical research departments throughout the U.S.A. In the present volume, Dr. Spilker has updated, rewritten, and combined much of his previous work into a single, albeit large, volume which clearly represents *the* definitive work on the topic.

If you like checklists, Dr. Spilker is your man. Take, for example, chapter 83, Specific Factors to Consider In Interpreting Efficacy in Safety Data. Tables 83.2–83.101 classify and list most of the factors that require consideration at one time or another in evaluating clinical study results. There is a slight risk here; in spite of a warning at the start of the chapter, the novice may be tempted to assume that such an exhaustive listing is indeed all-embracing. The author repeatedly points out he does not

pretend to cover all bases, but the book is so comprehensive that his warning is likely to be ignored. The checklist approach can be irritating. I am reminded of a note I found on the kitchen table while housesitting for one of the most efficient homekeepers I know. It began "get up, get dressed..." before proceeding to more specific activities.

This said, I cannot fault the book. The chapter titles and indices help one to find what one wants quickly, in spite of its size. There are useful chapters on helping explain statistics for nonstatisticians, and I enjoyed the quotations—including the less well-known ones—which introduce each part.

This book is a fitting summation of Dr. Spilker's contribution to the performance of clinical trials. The FDA and other drug regulatory bodies have set the standard for high quality clinical research, and Dr. Spilker gives excellent directions as to how to reach and exceed those standards in this monumental work. It is a superb reference source for active participants in clinical research, but, unfortunately, it will probably be of limited use to most medicinal chemists.

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Polarity Control for Synthesis. By Tse-Lok Ho. John Wiley & Sons, Inc., New York. 1991. xii + 403 pp. 16 × 24 cm. ISBN 0-471-53850-7. $59.95.

Author Ho introduces a useful concept that affords the retrosynthetic practitioner the most logical bond disconnections for a particular synthetic problem. The purpose of this book is not to review retrosynthetic analysis, but to bring forth the concept of "polarity control" and show its usefulness in retrosynthetic design. The book's emphasis is on the use and proper manipulation of the electronic properties of synthons in response to a retrosynthetic plan. Using this concept a carbon–carbon or carbon–heteroatom bond is derived from electronically charged synthons that are logically based upon known synthetic methods. Ho also points out that "the less logical disconnections should not be ignored".

The book is divided into 18 chapters; the first two chapters introduce the reader to Polarity Alternation and Umpolung (polarity inversion). Additional chapters cover individual topics, for example Synthesis of 1,2; 1,3; 1,4; and 1,5-Difunctional Compounds, Carbonyl Condensations, Diels–Alder Reactions, Photochemical Reactions, Fragmentation Reactions, and Rearrangements. Additional topics include the Michael and Mannich reactions, odd-membered ring compounds, and focusing on oxidoreductions. The book is comprised of many examples from the synthetic literature (natural products, etc.) which show the usefulness of polarity control in synthesis. A reference section is included and contains many citations from 1990. An index is also included.

This book should be of interest to all chemists involved with organic synthesis and particularly to graduate students in synthetic organic chemistry.

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Advances in Drug Research. Volume 20. Edited by Bernard Testa. Academic Press Inc., San Diego, CA. 1991. xi + 319 pp. 16 × 23.5 cm. ISBN 0-12-013320-2. $46.00.

This is the most recent addition to the popular continuing series and, as indicated in the editor's introduction, it is intentionally somewhat leaner than its predecessors. In the words of the editor, this volume strikes a blow against "elephantiasis of the textbook".

The lean and mean volume begins with the longest of four chapters, Extrapolation of Toxicological and Pharmacological Data from Animals to Humans, by W. R. Chappell and J. Mordenti. This is a subject about which most medicinal chemists (and, this reviewer suspects, some pharmacologists) are woefully ignorant. The chapter is comprehensive and provides much insight into problems involved and rational approaches to their solution.

The second chapter, Tissue Binding versus Plasma Binding of Drugs: General Principles and Pharmacokinetic Consequences, by B. Fichtl, A. v. Nieciecki, and K. Walter provides a lucid discussion and some mathematical aspects of another topic which is important in medicinal chemistry. This review should be an excellent introduction for the novice who wishes to expand his/her understanding of drug binding in the body and its therapeutic consequences.

Search for New Drugs of Plant Origin, by M. Hamburger, A. Marston, and K. Hostettmann, provides a contemporary view of a classical topic. Recent studies on natural products as anticancer agents, antagonists of platelet-activating factor, antimalarial agents, and AIDS-antiviral agents are addressed. The structures of many of these organic molecules provide raw material for philosophical contemplation by the chemist interested in structure–activity relationship and drug-design studies.

The final chapter, Histaminergic Agonists and Antagonists: Recent Developments, by R. Leurs, H. van der Goot, and H. Timmerman, provides a readable and useful survey and update of agonists and antagonists at the various subpopulations of histamine receptors.

All chapters in the volume are well-organized and well-written. Proofreading has been carefully done. The subject index seems to be well done. A cumulative index of authors and a cumulative index of titles for all 20 volumes in the series are included. References in all chapters are timely; the latter two chapters include some 1990 and 1991 literature citations.

This volume is a worthy addition to the series, and it is highly recommended for researchers in, inter alia, medicinal chemistry, pharmacology, and pharmaceutics.

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Methods in Enzymology. Volume 195. Adenylyl Cyclase, G Proteins, and Guanylyl Cyclase. Edited by Roger A. Johnson and Jackie D. Corbin. Academic Press, Inc., San Diego, CA. 1991. xxx + 512 pp. 16 × 23.5 cm. ISBN 0-12-182096-3. $69.00.

This volume in the continuing series *Methods in Enzymology* extends the information previously summarized in volumes XXXVIII, 99, and 159 on cyclic nucleotide research. The chapters included in Volume 195 focus on recent methodologies in assaying, purifying, and characterizing adenylyl cyclases, guanine nucleotide-dependent regulatory proteins (G proteins), and guanylyl cyclases. Accordingly, the book is organized into three main sections with each subdivided into three parts containing varying numbers of articles; a total of 44 articles by 78 investigators responsible for the research described are presented.

Section I specifically addresses adenylyl cyclase. Part A is comprised of two articles on determining adenylyl cyclase activity; part B contains three articles on the preparation of useful reagents (such as α-^{32}P-labeled nucleoside triphosphates, nicotinamide adenine dinucleotide, cyclic nucleotides, forskolin-agarose affinity matrices, and [^{3}H]forskolin) for purification of components of hormonally responsive adenylyl cyclase systems; part C consists of eight articles on the purification of adenylyl cyclases from a number of different sources. The focus of section II are the G proteins: part A deals with purification and characterization of representative G proteins, including the preparation of reagents used for these purposes. Labeling and quantitating of G proteins by modification with chemical, enzymatic, and photoaffinity techniques, by quantitative immunoblotting, and by kinetic–fluorescence determinations are the topics of seven chapters in part B. Part C consists of one article on the reconstitution of receptors and G proteins in phospholipid vesicles. Part A of section III on guanylyl cyclases contains one article dealing with assaying the cyclase catalytic activity. The following extensive section of ten articles (part B) focuses on the molecular cloning,

purification, and characterization of guanylyl cyclase isozymes. Part C contains four chapters on the regulation of guanylyl cyclases by atrial natriuretic peptide/receptors, phosphorylation/dephosphorylation, and calcium.

As a consequence of the growth and diversity of research in these areas, a comprehensive review encompassing the breadth of the topics included would not seem possible for one book. Yet, in keeping with this continuing treatise, Volume 195 of *Methods in Enzymology* presents a good picture of the current status of research related to adenylyl and guanylyl cyclases and G proteins and the volume should prove to be a useful addition to the complete series. For interested researchers, additional information on the topics presented can be gleaned from the ample references provided within the individual articles.

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