Book Reviews

The Alpha-1 Adrenergic Receptors. Edited by Robert R. Ruffolo, Jr. Humana Press, Clifton, New Jersey. 1987. xx + 543 pp. 15 × 23 cm. ISBN 0-89603-110-1. $79.50.

A review of the biochemical and pharmacological properties associated with the alpha-1 adrenergic receptor has been long overdue in part, I suspect, to the rapid explosion of work in this area in recent years. This book describes the current level of understanding of the "biochemical machinery" associated with this adrenergic receptor subtype.

The book is divided into seven main sections, beginning with a historical perspective on the alpha-1 receptor, followed by characterization of the receptor and its binding site, biochemical mechanism of receptor action, correlation of receptor binding and function, regulation of alpha-1 adrenergic receptors, agents interacting with alpha-1 receptors, and, finally, future vistas. The chapters contained within each of the main sections are authoritatively presented by individuals who have worked in the areas covered. The information contained within these chapters should prove useful to those investigators with a casual interest in adrenergic receptors and those active in the field (both the medicinal chemist, as well as the pharmacologist). In my opinion, even the most knowledgeable investigator will learn a thing or two from this book.

The chapters address all aspects of the alpha-1 adrenergic receptor ranging from characterization of the receptor binding site, structure–activity relationships associated with both agonists and antagonists, alpha-1 receptor heterogeneity, regulation of the alpha-1 receptor, the signal transduction process(es), to therapeutic applications of alpha-1 adrenergic agents. Information pertaining to both the peripheral and central alpha-1 receptors relating structure and function is also well presented.

As this field is very rapidly growing, the reader needs to be aware that parts of the book will most likely become quickly outdated. Nonetheless, the book is a good comprehensive review of the literature through 1985 and early 1986.

This book will prove to be a valuable resource to those active in the field and those interested in obtaining detailed information on any of the above-mentioned special topics. It is a recommended addition to one's own personal collections, but, at the very least, it is certainly desirable to have this book as a library holding in both industry and universities where there are medicinal chemists and pharmacologists.

Abbott Laboratories **John F. DeBernardis**
Drug Discovery
Pharmaceutical Products Division
Abbott Park, Illinois 60064

QSAR in Drug Design and Toxicology. Proceedings of the Sixth European Symposium on Quantitative Structure–Activity Relationships. Edited by Dusan Hadzi and Borka Jerman-Blazic. Elsevier Science Publishers B.V., Amsterdam, The Netherlands. 1987. x + 375 pp. 17 × 25 cm. ISBN 0-444-42767-8. $97.75.

This 10th volume in the Elsevier Pharmacochemistry Library contains the proceedings of the Portorose QSAR Conference. The book is divided into five sections of about 15 three- to four-page reports.

The headings in the five sections are as follows: Section I, Chemometrics in Drug Design; Section II, QSAR in Medicinal and Pharmacokinetics; Section III, Ligand–Receptor Interactions; Section IV, Structure–Activity Relations of Peptides; Section V, QSAR in Toxicology and Non-Medicinal Areas.

These 72 contributions include some very interesting developments in QSAR as well as reports on the continued use of established methods. Although these papers are of necessity quite brief, they are typically accompanied by appropriate data tables and illustrations. A list of references is given for each paper.

Section I: Chemometrics in Drug Design deals with a range of topics including Cramer's DYLOMMS, Kier Kappa shape analysis, Kaliszan principal component analysis, and Johnson's metric for structural similarity.

Section II: QSAR in Medicinal Chemistry and Pharmacokinetics includes papers by Seydel, Austel, Verloop, Tichy, Kuchar, van der Waterbeemd, and P. J. Taylor.

Section III: Ligand–Receptor Interactions includes Hopfinger on shape analysis, Lehmann on stereoselectivity, Hadzi on electrostatic potentials, and Janssen on thermodynamics of drug–receptor interactions.

Section IV: Structure–Activity Relations of Peptides. Fauchere discussed new strategies for peptide drugs. Meyer described crystallographic approaches to inhibitor design; Wold applied SIMCA and PLS; and Charton described parameters for peptide QSAR.

Section V: QSAR in Toxicology and Non-Medicinal Areas. Lipnick presented QSAR models of acute toxicity; Dearden described BOD models; Laass disclosed multivariate analysis; Hermans presented data on organophosphorus compounds; Benigni explored a data base for carcinogenicity, mutagenicity, and toxicity; and Deneer described QSAR for nitroaromatic compounds.

It is inevitable that the quality of papers is somewhat uneven in a volume of this type. This book is certainly a useful addition to the library. For those large numbers of persons interested in QSAR, this volume is recommended.

Department of Chemistry **Lowell H. Hall**
Eastern Nazarene College
Quincy, Massachusetts 01170

Receptor Biochemistry and Methodology, Vol. 11. Adenosine Receptors. Edited by D. F. Cooper and C. Londos. A. R. Liss, New York. 1988. xi + 134 pp. 18 × 26 cm. ISBN 0-8451-3710-7. $42.00.

Adenosine is a ubiquitously occurring modulator of mammalian cell function. With the publication of this volume, the third on this subject in the past year, the purine might also be considered ubiquitous in terms of monographs detailing its actions. However, unlike the other volumes, the present monograph does not reflect the proceedings of a symposium but is part of a continuing series on receptor function. The current volume comprises eight chapters, five of which are devoted to the characterization of adenosine receptor functionality, two to potential physiological roles, and one to adenosine-uptake sites. Overall the quality (and usefulness) of the chapters is high, those on chemical approaches (Jacobson), receptor binding (Bruns), structural studies (Cooper), cyclic nucleotide second messenger systems (Londos) and immunological aspects (Polmar et al.) being especially noteworthy. However, the chapters on mast cell secretion and adenosine transporters are so short (8 pages of text each) as to be superficial to the point of irrelevancy.

Of the more current volumes in the area of adenosine research, this is one of the more cohesive and objective and, to the ardent adenophile, will be required reading. However, inevitable comparisons will be made to Gerlach and Becker's encyclopedic *Topics and Perspectives in Adenosine Research* (Springer-Verlag, 1987) which resulted from the 3rd International Symposium on Adenosine. Thus for the medicinal chemist, pharmacologist, and molecular pharmacologist more broadly interested in the pharmacological and physiological potential of adenosine, the latter volume is far more comprehensive and correspondingly useful.

While the present slim volume is overall of high standard, its size and coverage tends to limit its usefulness. To the present reader, a volume three times the size under the same capable

editorial leadership would have been most welcome.

Research Department **Michael Williams**
Pharmaceuticals Division
CIBA-GEIGY Corporation
Summit, New Jersey 07901

Patent Law for the Nonlawyer; A Guide for the Engineer, Technologist and Manager. By Burton A. Amernick. Van Nostrand Reinhold, New York. 1986. xii + 177 pp. 21 × 28.5 cm. ISBN 0-442-20788-3. $36.95.

The intent of this book is to explain current patent laws in a manner that avoids complex legal terminology and enables ready understanding by someone not trained in patent law. It is intended for engineers, scientists, and managers. The underlying reasons and philosophy for having a patent system are explained. In addition, the important differences between patents, trademarks, copyrights, and trade secrets are described. Among other important topics covered are the criteria of what constitutes a patentable invention in the United States and presents the major provisions of international patent treaties, such as the Paris Convention, the Patent Cooperation Treaty, and European Patent. The book also includes a description of what must be included in a patent application and why, how a patent is processed by the United States Patent and Trademark Office, the determination of inventorship and the importance of keeping proper records. By far, the major portion of the book is devoted to utility patents, although a description of design and plant patents is also included. There are also details on the relatively new procedure for the reexamination of already issued patents and recent case laws in computer programming and genetic engineering. The book includes a number of appendices that present very useful information, e.g., exemplary patents, rules of practice in patent and trademark cases, United States Patent and Trademark Office fees, an exemplary employee confidentiality agreement, a model record of invention, and a guide to the public patent search facilities of the U.S. Patent and Trademark Office. The book is concluded with a very adequate index.

This clearly written book is highly recommended for all medicinal and other research chemists and managers who want to protect their inventions.

Staff

Tumor Cell Differentiation. Edited by J. Aarbakke, P. K. Chiang, and H. P. Koeffler. The Humana Press, Inc., Crescent Manor, P.O. Box 2148, Clifton, New Jersey 07015. 1987. xv + 347 pp. 16 × 23 cm. ISBN 0-89603-134-9. $64.50.

This is a disappointing book. Containing the proceedings of an international symposium by the same title held in Norway in mid-1986, it describes, according to the editors, "recent advances in tumor cell differentiation and [an attempt] to bridge the gap between experimental findings and clinical application of new knowledge". A worthy goal indeed, but unfortunately there is really insufficient new information to go around and justify a volume of this size (and price). The overwhelming emphasis (16 of 24 chapters) is on the hematopoietic system, and while here there have been significant advances in the form of colony stimulating factors (CSFs), the lack of any discussion on epithelial cell differentiation is a serious omission. The vast majority of human malignancies arise from epithelial cells, and it is this population that must move to center stage if tumor cell differentiation is to make a significant impact in the clinic. Over the last few years tangible progress has been made in this area, particularly with colorectal and lung cancer, but these terms along with breast neoplasms do not find their way into the index. This is not to dismiss the importance of understanding differentiation in the hematopoietic system, but even here although a thorough background chapter is presented by Leo Sachs, the authoritative review of G-CSF by Malcolm Moore was out of date over 18 months ago. Interested readers should consult more nimble and recent publications to keep abreast of the exciting CSF developments in the clinic. While this volume may provide a useful purpose to those wishing to review aspects of hematopoietic cell differentiation, it is not recommended for the generalist, clinical oncologist, or those seeking up-to-date insights into the maturation of human epithelial cells and their malignant counterparts.

Smith Kline & French Laboratories **Russell G. Greig**
P.O. Box 1539
King of Prussia, Pennsylvania
19406-0939

Alternatives to Animal Use in Research, Testing and Education. Compiled by the Congress of the United States, Office of Technology Assessment. Marcel Dekker, New York. 1988. xii + 441 pp. ISBN 0-8247-7977-0. $59.75.

The estimated 17–22 million animals used for experimental studies in the United States each year has caused much public concern. Clearly there is a societal need for the use of animals to enable continued progress in biomedical, toxicity, testing, and related science. The humane use of these animals is imperative and has been dealt with by Congress which enacted three laws and amendments to the Animal Welfare Act in 1985. In this book the Office of Technology Assessment analyzes the scientific, regulatory, economic, legal, and ethical considerations in alternative technologies for deriving vital scientific information. The 16 chapters plus appendices A–H focus on tissue-culture procedures and computer simulation for replacing, reducing, or refining current experimental methods using procedures that are simpler, more reliable, economical, and humane. Federal, state, and institutional regulation of animal use are carefully reviewed.

The book draws on the expertise of animal and welfare groups, industrial testing laboratories, medical/veterinary schools, federal regulatory agencies, scientific societies, academia, and concerned citizens to advance practical options in important areas of public policy regarding animals. Many advances have been made in developing new alternatives to the routine use of animals in deriving biomedical and related information. This book goes a long way to disseminating this information and is a must for all medical and related libraries.

Staff

Approaches to Elucidate Mechanisms in Teratogenesis. Edited by Frank Welsch. Hemisphere Publishing Corporation, Washington, D.C. 1987. xvi + 285 pp. 15 × 23 cm. ISBN 0-89116-584-3. $79.95.

One of the stated aims of the Eighth CIIT Conference on Toxicology which was held in Research Triangle Park, NC, on April 2–3, 1986, was to indicate how little is known concerning the mechanisms of action of various developmental toxicants, including established human teratogens such as thalidomide and retinoic acid. In this, the participants, a group of leaders in the field of prenatal toxicology, succeeded. Nearly every chapter presents a different approach currently being used to address mechanistic questions. Although only mammalian systems are covered, both in vivo and in vitro methodologies are included. It is clear that no one approach will be appropriate for every chemical, and many chemicals may act via multiple mechanisms.

Individual approaches to mechanistic studies vary. In some chapters the approach is compound-oriented and in others it is technique-oriented. For example, the chapter on cyclophosphamide reviews in depth results using a variety of methods, both in vivo and in vitro, which have been utilized to address the question of the mechanisms of cyclophosphamide-induced teratogenesis. On the other hand, the chapter on correlation of DNA alkylation and abnormal development focuses on results derived from employing the technique of DNA alkylation to examination of several methylating and ethylating agents.

The issues of extrapolation from animal studies to humans and the role of mechanistic studies in human risk assessment are briefly discussed in a few chapters and are considered at greater length in the closing panel discussion. A number of chapters focus on retinoids and discuss structure–activity relationships, pharmacokinetics, placental transfer, metabolism, the role of receptors, effects on gap junctions, and effects on protein synthesis. A few chemicals, such as retinoic acid, phenytoin, the glycol ethers, and

valproate are discussed in several chapters.

A good deal of emphasis has been placed on the role that in vitro techniques are beginning to play in addressing mechanistic questions. The utility of the rodent whole embryo culture system in directly assessing the effects of chemicals on the embryo in the absence of confounding maternal factors is made clear in a number of chapters. In addition several chapters focus on the effectiveness of the culture of embryonic cells using a variety of endpoints.

As in any volume of this type, the style and quality of writing varies from chapter to chapter. In addition, a good deal of the data has in all likelihood been published in the two years since the meeting. However, as a general overview on the types of approaches currently being employed to address the issues of mechanisms in teratogenesis, this book will be a valuable addition to the teratologists' bookshelf.

Deborah K. Hansen
Division of Reproductive and Developmental Toxicology
National Center for Toxicological Research
Jefferson, Arkansas 72079

Tetratogens. Chemicals Which Cause Birth Defects. Edited by Vera Kolb Meyers. Elsevier, Amsterdam. 1988. xii + 472 pp. 17 × 25 cm. ISBN 0-444-42914-X. $171.00.

This book is Volume 31 in the *Studies in Environmental Science* series. It deals with the practical aspect of teratogens, i.e., chemicals which cause birth defects. It deals with fundamental issues, such as how to obtain information about the teratogenic potential of chemicals. The book consists of eight chapters. The first chapter addresses the teratogenic potential of chemicals. Other chapters give lists of names of close to 5000 chemicals associated with the causation of birth defects (Chapter 2, 196 pages), teratogenic chemicals in academic and industrial chemical laboratories, the safe handling of these chemicals, the utilization of registered data in studies of occupational exposure and pregnancy outcome, the long-term effects of chemicals on developing brain and behavior, and the teratogenicity of pesticides and other environmental pollutants.

The book, which was designed as a unique guide to chemicals that cause birth defects and how to find information about these agents, seems to meet this objective very effectively. A comprehensive bibliography, with up-to-date references for more in-depth coverage, is included with each chapter. The book should be of interest, or at least available, to medicinal chemists who are designing and studying new chemicals as potential therapeutic agents. Other academic and industrial chemists, health professionals, as well as students in the health and related sciences, will find this book of interest at least as a library source.

Staff

Pain and Headache. Volume 9. Neurotransmitters and Pain Control. Edited by H. Akie and J. W. Lewis. S. Karger AG, Basel. 1987. x + 304 pp. 17 × 24 cm. ISBN 3-8055-4579-7. $98.00.

This is the ninth volume of *Pain and Headache*, Series Editor, Philip L. Gildenberg; it addresses one of the most severe obstacles in developing effective analgesia-inducing drugs, that is, the identification of neurotransmitters of pain. As no single transmitter or modulator is solely responsible for pain perception or inhibition, almost every central neutrotransmitter has been studied and found to have some relation to pain. In this book, the editors have collected the knowledge of various experts in the field of neurochemistry of pain and analgesia with the primary objective of presenting the reader with an overview of the potential modulatory role of the three principal classes of neurochemical substances, namely: (1) classical neurotransmitters, e.g., the catecholamines, serotonin, and acetylcholine, (2) the opioids, and (3) the non-opioid peptides. In each of the areas there is a general overview, as well as chapters devoted toward specific aspects of the particular topic. The section on non-opioid peptides and analgesia focuses mainly on cholecystokinin, but also addresses more than 30 non-opioid neuropeptides ranging from substance P to vasopressin to bradykinin that have been identified in mammalian brain. This chapter should be particularly thought-provoking to medicinal chemists searching for new approaches to analgesia. The final section of the book focuses on known analgetic phenomena, e.g., acupuncture and stress-induced and stimulation-produced analgesia.

The book should be of significant interest to medicinal chemists and other scientists and practitioners concerned with development of new pharmaceutical agents for relief from pain.

Staff

Actions of Prolactin on Molecular Processes. Edited by James A. Rillema. CRC Press, Boca Raton, Florida. 1987. iv + 222 pp. 18 × 26 cm. ISBN 0-8493-5376-9. $112.00.

Prolactin is a hormone secreted by the pituitary gland. Prolactins found in both mammalian and nonmammalian species are quite similar in molecular structure and produce a number of proliferative and differentiative actions on many cell types from a number of animal species. This book focuses on the molecular processes involved in the induction of these effects. Most of this research has been conducted employing the mammary gland as the target organ. As a consequence most of the book addresses how prolactin produces its effects on this organ, where it has been implicated in promotion of neoplastic processes as well as other events. Although the initial interaction of prolactin is with specific receptors, subsequent molecular events that culminate in the biological actions it evokes are not fully understood. In this book a variety of topics, e.g., the effect of prolactin on membrane fluidity and prostaglandin formation, as well as the role of calcium, phospholipids, polyamines, tubulin, protein phosphorylation, and many other aspects of responses to this hormone are comprehensively reviewed in 11 chapters. Unfortunately, very few post-1984 references are cited and the book is quite expensive.

The greatest value of this book resides in its assembly of a series of thorough reviews on a specialized topic. As such, it may provoke additional research in this area; however, it will probably be of interest to a very select group of scientists.

Staff

Synthesis of Fused Heterocycles. By Gwynn P. Ellis. Wiley, New York. 1987. xii + 660 pp. 16 × 24 cm. ISBN 0-471-91431-2. $288.00.

This book represents the 47th volume of the Interscience Series, The Chemistry of Heterocyclic Compounds, edited by E. C. Taylor. The author's stated intention is "to provide a convenient way of locating papers (and reviews) on methods for the synthesis of a heterocyclic ring which is fused to another ring". This goal is accomplished admirably. In this book, the newly formed ring is limited to five to eight atoms, at least one of which is nitrogen, oxygen, or sulfur, and may be fused to a homocyclic or heterocyclic ring. In the 106 chapters following the introduction, these cyclizations are classified according to the functional groups present in the precursor that are undergoing reaction. In addition, an Index of Ring Systems produced by these reactions is included at the rear of the text for those interested in methods of preparation for a particular fused heterocycle. Each reaction sequence is presented with reactants, conditions, products, and reference. No mechanisms are presented for the transformations, although occasional comments concerning possible mechanisms are scattered throughout the descriptive portion of the book.

The author has provided a valuable service to the reader by showing the IUPAC-approved method of drawing each of the fused heterocycles whose synthesis is described. In addition the approved name of the product ring system is listed with the formula. An appendix provides a condensed version of naming fused heterocycles. This commitment to following the rules is highly commendable in this area of complex systems, where many authors draw structures according to a favorite preference.

A list of Books and Monographs utilized for subject matter is included as are the 2027 references that include papers from about 1970 to 1986. A treasure scattered throughout the book is the

surprise mention of a review (with reference) for a variety of reagents, reactions, and products.

As with any coverage of this magnitude, a number of typographical errors or structural ambiguities occur. However these are generally insignificant and easily recognized. This volume continues the high quality and tradition of this valuable series.

Medicinal Chemistry Department **Kenneth L. Shepard**
Merck, Sharp and Dohme Research Laboratories
West Point, Pennsylvania 19486

Drugs Affecting Lipid Metabolism. Edited by R. Paoletti, D. Kritchevsky, and W. L. Holmes. Springer-Verlag, New York. 1987. xvi + 451 pp. 17 × 25 cm. ISBN 0387-17277-7. $76.50.

The volume is a collection of papers presented at the Drugs Affecting Lipid Metabolism Meeting, held in Florence, Italy (October 1986). With the wide acceptance of the clinical efficacy of cholestyramine and establishment of a direct association between drug-induced reductions of plasma levels of total and LDL cholesterol and coronary heart disease in a high-risk population, there has been an exponential growth of interest in drugs and strategies to control plasma cholesterol levels. Two of the most significant advances since cholestyramine have been the discovery and development of HMG-CoA (hydroxymethylglutaryl-CoA) reductase and ACAT (cholesterol acyltransferane) inhibitors.

The volume consists of 84 papers of an average length of five pages. The papers are structured in a standard research format and are liberally illustrated with figures and tables and well referenced. The papers are arranged loosely around particular topics, strategies, or specific agents, but without specific subdivisions, headings, or introductory or summary chapters. Subject and contributor indexes are adequate. In general, there are few attempts to summarize the state of the broader areas of research or to elucidate future directions. The organization of the volume will not be useful to readers not at least generally familiar with the subject matter. Subjects covered include turnover of HMG-CoA reductase, regulation of ACAT cholesterol, 7α-hydroxylase, apolipoprotines, and lypoprotein lipase, animal models, considerations for controlled clinical testing of antilipid drugs, dietary manipulations, and characterizations and efficacies of new drugs.

Drugs Affecting Lipid Metabolism is a state-of-the-art (1987) research update; it is of specific interest to investigators actively engaged or intending to be engaged in studies of lipid metabolism with an emphasis toward therapeutic interventions and is a must for major academic and industrial research libraries. However, the volume will rapidly become dated and of diminished interest as its contents are eclipsed by the rapid pace of research in this area.

Smith Kline & French Laboratories **Lewis B. Kinter**
Philadelphia, Pennsylvania 19101

Nitrosation. By D. L. H. Williams. Cambridge University Press, New York. 1988. x + 214 pp. 15 × 23 cm. ISBN 0-521-26796-X. $49.50.

This book is devoted solely to chemical reactions in which a nitroso group (NO) is introduced into molecules. Thus, it is a first compilation on a very old subject. As a result many references to the long-standing literature, as well as a few recent additions, are cited in this up-to-date review that covers topics such as the reagents used to effect nitrosation as well as nitrosation reactions at aliphatic carbon, aromatic carbon, nitrogen, oxygen, and sulfur atoms. Other sections discuss the rearrangement of aromatic *N*-nitrosamines (the Fischer-Hepp rearrangement), other reactions of nitrosamines, including the carcinogenic behavior of these compounds especially those formed endogenously, and the 1,5-rearrangement of the nitroso group in alkyl nitrites to give 4-nitroso alcohols (the Barton reaction). Both synthetic and mechanistic aspects of nitrosation are presented.

Despite its age, nitrosation remains an important process in organic chemistry. This book will at times be of interest to most synthetic organic chemists and deserves a place in libraries available to these scientists.

Staff

Nutrients and Brain Function. Edited by W. B. Essman. Karger, Basel, Switzerland. 1987. vii + 252 pp. 17 × 24 cm. ISBN 3-8055-4566-5. $146.00.

This book presents the papers delivered at a conference sponsored by the American College of Nutrition and a pharmaceutical company. The meeting was held in Scottsdale, AZ, in February 1986. As stated in the preface, the book's aim is to give a representative cross section of contemporary approaches to nutrients and brain function. Toward this goal, 39 participants contributed 19 chapters in the following sections: Basic Processes, Behavioral Processes, Behavior Pathologies, and Psychosocial Processes. Each of these topics is addressed in three to eight papers.

The first quarter of the book contains information that will be of interest to biochemists and neuroendocrinologists. Empirical and theoretical papers address protein glyconeogenesis, prevention of free-radical formation by phosphatidylserine, the neurophysiological sequelae of magnesium deficiency, and precursor-dependent neurotransmitter synthesis in brain. All of these papers are well written and referenced with recent citations.

In our estimation, the best chapters appear in the section on Behavioral Processes. Some of these address (and negate) the theory that sugar causes hyperactivity. Others, interestingly, represent different points of view concerning the involvement of nutrition in the etiology and alleviation of age-related memory decline. These chapters are timely, well-written presentations that will appeal to readers with an interest in brain–behavior relationships. The remaining half of the volume considers nutrients as causes or treatments of behavior disturbance. Discussion is directed toward many different problems: eating disorders, psychosis, attention deficit disorder, criminality. Unfortunately, some of these later chapters are not as well-written, clearly understood, or referenced with recent citations as those in the initial part of the book. They do, however, represent the state of the art in nutritional therapies, and all provide interesting case material or novel treatment ideas. This volume will be of interest to those specializing in research or treatment involving nutrients and behavior.

Department of Psychology **Bonnie Spring**
Texas Tech University **Candy Mathers**
Box 4100
Lubbock, Texas 79409

Brain 5-HT$_{1A}$ Receptors. Edited by C. T. Dourish, S. Ahlenius, and P. H. Hutson. Published jointly by Ellis Horwood, Ltd., Chichester, England, and VCH Verlagsgesellschaft, Weinheim, Federal Republic of Germany. 1987. 306 pp. 17 × 24 cm. ISBN 0-89573-575-X. $85.00.

Brain 5-HT$_{1A}$ Receptors is a complication of 23 papers by an esteemed group of European authors who have made significant contributions to this field of study. All of the chapters are short—some being brief reviews and others being original research contributions—and most are easy to read. Although this volume is obviously devoted to a particular population of serotonin receptors (i.e., 5-HT$_{1A}$ sites), it is, in actuality, devoted primarily to the considerable impact that the 5-HT$_{1A}$-selective agent 8-hydroxy-2-(di-*n*-propylamino)tetralin (8-OH DPAT) has had on the study of this important neurotransmitter. Of the several different populations of 5-HT receptors currently known, few are associated with agents that display significant selectivity as agonists or as antagonists; thus, the discovery of 8-OH DPAT has been a real boon to investigations involving 5-HT$_{1A}$ receptors.

Following an introduction by Arvid Carlsson, whose group was largely responsible for the development of 8-OH DPAT ,the book is divided into four sections: Chemistry, Biochemistry, Pharmacological and Physiological Effects, and Behavioral and Clinical Effects. Particularly interesting are the chapters describing the functional relevence of 5-HT$_{1A}$ receptors and the potential clinical

significance of 5-HT_{1A} agents. Whatever criticisms might be levied relate not to content but rather to depth. All pertinent aspects of 8-OH DPAT are given at least some mention and those areas not discussed in great detail do provide references for those with further interest. Nevertheless, some topics might have been given more coverage. The Chemistry section is a case in point. Six pages (excluding references) are devoted to the medicinal chemistry of 8-OH DPAT, and approximately five are devoted to molecular modeling studies. There are no chapters describing the medicinal chemistry of other agents with 5-HT_{1A} activity, nor to the structure–activity relationships (SAR) of such agents (including the SAR of indolealkylamines such as 5-HT, itself), which might have been expected of a book bearing the present title. Finally, a summation chapter highlighting some of the more important findings might have been a useful addition. Nevertheless, being the first published review of its kind, it is an excellent source book for those neuroscientists interested in 8-OH DPAT, and a valuable reference for those working in the serotonin area.

Department of Medicinal Chemistry **Richard A. Glennon**
School of Pharmacy
Medical College of Virginia
Virginia Commonwealth University
Richmond, Virginia 23298-0581

Advances in Enzymology and Related Areas of Molecular Biology, Vol. 61. Edited by Alton Meister. Wiley, New York. 1988. vii + 557 pp. 15 × 23 cm. ISBN 0-471-81830-5. $59.95.

Within this most recent addition to the series of *Advances in Enzymology*, eight diverse, yet timely, topics are presented. The first chapter in this volume by H. F. Fischer (pp 1–46) describes a unifying model of the thermodynamics for the formation of dehydrogenase–ligand complexes. This provocative theory is supported primarily by evidence with complexes formed with one enzyme, glutamate dehydrogenase; that the theoretical relationships are maintained for other systems within this class is supported by fragmentary evidence. Extrapolation of the theory to other enzyme classes is proposed, leaving to the reader the challenge of experimentally testing the model as a more general theory.

Three contributions represent generalized enzymological concepts with technical or investigative protocols for their implementation. The first of these topics, determination of the molecular size of enzymes by radiation inactivation, is presented by E. S. Kempner (pp 107–148). The broad description of this technique begins with its theoretical basis; additional discussion includes approaches toward validation of the theory, typical experimental conditions, methods of data analysis, and representative applications. The chapter on the behavior and significance of slow-binding enzyme inhibitors (pp 201–302) is an extremely thorough and interesting overview. In this section, authored by J. F. Morrison and C. T. Walsh, a brief description of the commonly recognized classes of enzyme inhibitors precedes an ample presentation of theoretical and practical considerations of the title topic. Examples of specific cases classified within six distinct mechanistic categories allow the reader a good feel for the scope of the research that has been conducted with slow-binding inhibitors. Topic three by C. L. Tsou (pp 381–436) focusses on an approach to the study of substrate reaction kinetics during irreversible modification of enzyme activity. A theoretical discussion of substrate kinetics during irreversible enzyme activation and inhibition is followed by results from several examples studied since this kinetic approach was first proposed by the author in 1965. Of particular interest are applications of the method to obtain results which may be more difficult to approach through more conventional kinetic techniques.

The other four contributions to this volume represent reviews of specific enzyme systems that have been the research focus of the contributing authors. J. Jeffery and H. Jornvall (pp 47–106) present a broad-based discussion on sorbitol dehydrogenase. Topics of this well-presented review include substrate specificity, genetics and regulation, functional and structural properties, predicted molecular structures, structural relationships to other enzymes, and metabolic roles. An excellent overview of calcineurin (pp 149–200), the major soluble calmodulin-binding protein in brain extracts, was written by C. B. Klee, G. F. Draetta, and M. J. Hubbard. This article includes discussions on purification, structural and catalytic properties, structure–function relationships, and physiological role of this highly regulated Ca^{2+}-calmodulin-dependent protein phosphatase.

The third topic emphasizes ADP ribosylation of guanyl nucleotide binding regulatory proteins (G-proteins) by bacterial toxins (pp 303–380). Herein, J. Moss and M. Vaughan describe the recognized perturbations and alterations in normal functions of the G-protein signal transduction and regulation of metabolic pathways induced by pathogens; subtopics include the pertussis toxin, choleragen, *E. coli* enterotoxin, and mono-ADP-ribosyltransferases from animal cells. The final special topic (pp 437–458), contributed by V. Mizrahi and S. J. Benkovich, describes dynamics of the reactions catalyzed by DNA-polymerase. This review emphasizes chemical principles at the molecular level which underlie DNA replication, focussing on the dynamics of the polymerase-catalyzed phosphodiester bond making and breaking reactions. Contents of this chapter include considerations of the mechanism of the polymerization reaction and integration of both the polymerase and exonuclease activities.

As in previous volumes of this series, the diversity of topics should present to most readers one or more articles of personal interest and utility. The volume is an excellent addition to the continuing series, and should be given special consideration by those investigators specifically interested in the theory, applications, and special topics described in the chapters.

Research and Development Division **Mark A. Levy**
Department of Medicinal Chemistry
Smith Kline & French Laboratories
King of Prussia, Pennsylvania 19406-0939

The Opiate Receptors. Edited by Gavril W. Pasternak. Humana Press, Clifton, NJ. 1988. xviii + 499 pp. 16 × 24 cm. ISBN 0-89603-120-9. $79.50.

Because of the steady growth of and interest in this facet of opioid research which now includes almost all areas of the neurosciences and biochemical pharmacology, *The Opiate Receptors* is a timely volume with international and renowned authorship. The editor has succeeded admirably in his stated goal, "to give a coherent overview of opiate receptor pharmacology and to provide insights into both the molecular and the classical pharmacology of the opiate and the opioid peptides".

Section 1, Historical Perspectives, is composed of two chapters: The Evolution of Concepts of Opioid Receptors by W. R. Martin and The Opioid Peptides by C. J. Evans, D. L. Hammond, and R. C. A. Frederickson. Chapters 3 (Early Studies of Opioid Binding by G. W. Pasternak), 4 (Multiple Opioid Binding Sites by Y. Itzhak), 5 (The Receptor by R. S. Zukin and S. R. Zukin), and 6 (Solubilization and Purification of Opioid Binding Sites by E. J. Simon and J. M. Hiller) constitute Section 2. Characterization of Opioid Receptor Binding Sites, Section 3, Location of Opioid Receptors, is contributed by R. R. Goodman, B. A. Adler, and G. W. Pasternak as Chapter 7. Mechanisms of Receptor Action (Section 4) is presented in Chapters 8 and 9 (Opioid-Coupled Second Messenger Systems by S. R. Childers and Electrophysiology of Opiates and Opioid Peptides by C. Chavkin, respectively). Chapter 1 (Central Action of Opiates and Opioid Peptides by P. L. Wood and S. Iyengar) and Chapter 11 (Peripheral Actions Mediated by Opioid Receptors by B. M. Cox) make up Section 5, Pharmacological Correlation of Binding Sites with Function. Section 6, Regulation of Opioid Receptors, is contributed by S. G. Blanchard and K.-J. Chang (Regulation of Opioid Receptors, Chapters 12) and A. P. Smith, P.-Y. Law, and H. H. Loh (Role of Opioid Receptors in Narcotic Tolerance/Dependence, Chapter 13). The final section (7), Future Vistas (Chapter 14, Opiate and Opioid Peptide Receptors: The Past, The Present and The Future) is, appropriately, by the editor, G. W. Pasternak, who discusses The Classical Era, The Molecular Era, Receptor Homogeneity, Receptor Functions, Tolerance and Dependence, and Clinical Perspectives.

This book, the only (minor) criticism of which is that opioid rather than opiate should have been used in the title and some places in the text, will be a valuable resource for researchers and

educators in the opioid area. It correlates well the biochemical, physiological, and pharmacological aspects of opioid actions.

Medical College of Virginia **Everette L. May**
Richmond, Virginia 23298

Organoselenium Chemistry. Edited by Dennis Liotta. Wiley-Interscience, New York. 1987. ix + 422 pp. 16.5 × 24 cm. ISBN 0471-88867-2. $65.00.

The aim of this book is to cover developments in organoselenium chemistry since 1973. Special emphasis is placed on the use of selenium compounds as synthetic intermediates. Chapters include Electrophilic Selenium Reactions (T. G. Back), Organoselenium-Based Ring Closure Reactions (K. C. Nicolaou et al.), Seleninic Anhydrides and Acids in Organic Synthesis (S. V. Ley), Nucleophilic Selenium (D. Liotta et al.), Selenium Stabilized Carbanions (H. J. Reich), The Chemistry of Selenocarbonyl Compounds (F. S. Guziec), Radical Reactions of Selenium Compounds (T. G. Back), [2,3] Sigmatropic Rearrangements of Organoselenium Compounds (H. J. Reich), Organic Metals Based on Selenium Compounds (F. Wudl).

As would be expected in multiauthored books, the coverage of the literature and the quality of the writing are quite uneven. Several of the chapters provide very little material beyond 1984. It should also be noted that most of the chapters look at selenium compounds in isolation from analogous oxygen, sulfur, and tellurium compounds with little effort being made to correlate the chemistry and the physicochemical properties of the chalcogenic isologues. It is unfortunate that the very interesting subject of selenium-containing enzymes such as glutathione peroxidase and glycine reductase is just barely mentioned and that there is very little discussion of other biologically active selenium compounds. The last chapter on the very interesting subject of organoselenium-based conductors could have been expanded.

On the other hand, the book provides an excellent review of recent developments in the organic chemistry of selenium compounds and provides an excellent addition to other texts such as the admirable (but out of date) volume by Klayman and Günther. This book will be an essential addition to the library of every selenium chemist.

Tufts University **Henry G. Mautner**
School of Medicine
Department of Biochemistry
Boston, Massachusetts 02111

Hydrogels in Medicine and Pharmacy. Vol. I, Fundamentals; Vol. II, Polymers; Vol. III, Properties and Applications. By Nikolaos A. Peppas. CRC Press, Boca Raton, FL. Vol. I: 1986. 180 pp. 18 × 26 cm. ISBN 0-8493-5546-X. $94.00. Vol. II: 1987. 171 pp. 18 × 26 cm. ISBN 0-8493-5547-8. $95.00. Vol. III: 1987. 195 pp. 18 × 26 cm. ISBN 0-8493-5548-6. $110.00.

This book consists of three volumes. Volume I is entitled *Fundamentals* and is divided into five chapters with the following titles: Preparation Methods and Structure of Hydrogels, Characterization of the Cross-Linked Structure of Hydrogels, Solute Diffusion in Hydrophilic Network Structures, Hydrogel Surfaces, Immobilization of Biomolecules and Cells on and Within Synthetic Polymer Hydrogels, and Protein Adsorption to Hydrogels. Volume II is entitled *Polymers* and is divided into five chapters with the following titles: Hydrogels of Poly(Vinyl Alcohol) and its Copolymers, Structure and Physical Properties of Poly(2-Hydroxyethyl Methacrylate) Hydrogels, Biomedical Applications of Poly(2-Hydroxyethyl Methacrylate) and its Copolymers, Poly(Ethylene Oxide) and Related Hydrogels, and Water-Swollen Cellulose Derivatives in Pharmacy. Volume III is entitled *Properties and Applications* and is divided into nine chapters with the following titles: Hydrogels for Blood Contact, Heparinized Hydrogels, Hydrogels as Contact Lens Materials, Hydrogels for Artificial Tendons, Equilibrium Swollen Hydrogels in Controlled Release Applications, Dynamically Swelling Hydrogels in Controlled Release Applications, Bioerodible Hydrogels, Bioadhesive Hydrogels, and Other Biomedical Applications of Hydrogels. The 20 individual chapters were prepared by 29 contributors, many of them well-known and prominent scientists in the hydrogels area. Dr. Peppas, in addition to being the editor, also was a contributor to seven individual chapters.

Since this is a multiauthored book, one could expect an unevenness in the presentation of the subject matter. It is evident that the editor has worked hard to prevent this from occurring, as evident by cross-listing of chapters, equations, and theories. All three volumes are laid out in a fashion with the reader in mind and written in clear English. As with any major undertaking such as this, the timeliness of the cited references leave something to be desired and varies from chapter to chapter. In many cases, the most recently cited references are from the time period of 1983–1986. There is an adequate subject index in each volume.

All three volumes deal with a subject of substantial current interest and should be valuable to both the nonexpert and expert. The three volumes provide an excellent source for literature and represent an excellent first place to go for important information. They should be a valuable addition to an industrial or academic library, and to the personal library of those specializing in hydrogels.

Research and Development Division **Gerald P. Polli**
Smith Kline & French Laboratories
King of Prussia, Pennsylvania
19406-0939

Art in Organic Synthesis. By Nitya Anand, Jasjit S. Bindra, and Subramania Ranganathan. Wiley, New York. 1988. xix + 427 pp. 16 × 24 cm. ISBN 0-471-88738-2. $39.95.

Nearly 100 objets d'art have been selected for display in this second edition of *Art in Organic Synthesis*, which follows the first by 18 years. Needless to say, the state of the art has advanced considerably in the interim. The authors have chosen 62 major works of the new period while retaining slightly more than half that number of the old masterpieces. It could be argued that a second volume entirely devoted to post-1970 efforts might have allowed greater coverage. On the other hand, side by side comparison of old and new renderings of the same subject has certain pedagogical value. Thus, for example, a 12-part collage provides an interesting chronicle of advances in the strategy and methodology of estrone synthesis from 1958 to 1986.

As in the previous edition, the flow chart approach is used to outline each work following a brief introduction of historical or biological relevance. Noteworthy steps are elaborated briefly in footnotes. Reagents for a given step or, more often, a sequence of several numbered steps are enclosed in brackets which interrupt the usual arrow symbol. This deviation from the more common listing of numbered steps above and below the arrow symbol does little to enhance clarity and actually wastes space. Furthermore, the occasional grouping of 5–10 steps within one bracket tends to decrease the visual connectivity of the synthetic chain and undermines a major strength of the flow chart format.

The works displayed range from such Renaissance selections as quinine, reserpine, strychnine, and estrone, efforts that marked the beginnings of the modern synthesis era, to such "hopelessly complex" contemporary targets as erythromycin, rifamycin S, monensin, and vitamin B_{12} with their "plethora of asymmetric centers". Included also are ample samplings of art nouveau represented by betweenanenes, catenanes, cavitands, cubane, prismane, the venerable dodecahedrane, sexipyridine, and superphane, to mention a few. To complete the picture the authors have sketched out examples of gene and peptide syntheses.

At $39.95 *Art in Organic Synthesis* is below the lofty price range of many art books and, with the 25% discount available to members of the ACS Organic Division, it should be affordable to most. The structures are clearly presented and almost free of errors. Footnotes amplifying mechanistic points or directing the reader to related work are located at the bottom of the pages on which they are cited for easy accessiblity to the reader. Indexes of Reagents and Reaction Types catalog various synthetic transformations, but the categories tend to be broad and the collections are of marginal value. Readers who would most likely benefit from this work are students with a developing interest in synthetic organic chemistry and chemists with some synthesis

background who would like a broad overview on developments in the art. The highly visual format encourages casual browsing, and the eclectic mixture of targets provides a good sampling of major happenings in synthesis over the past four decades.

Department of Chemistry **James A. Marshall**
University of South Carolina
Columbia, South Carolina 29208

Characterization of Proteins. Edited by Felix Franks. Humana Press, Clifton, NJ. 1988. xix + 561 pp. 15.5 × 23.5 cm. ISBN 0-89603-109-8. $69.50.

This book provides a unified approach to several essential aspects of protein technology: the parameters that are essential for the successful isolation, separation, characterization, and stabilization of proteins are included. This monograph treats proteins as valuable but labile chemical raw materials that are easily inactivated by conventional processing techniques. The content is presented by six authorities in their respective areas and is based on several postexperience courses taught by the authors in the U.S. and Europe. The first five chapters are written by Franks and start with a general survey of the chemical and functional properties of proteins and the economics of protein isolation and processing. Parameters such as internal structure, solution properties, conformational stability, and hydration which define protein stability in vitro are then reviewed. In the next three chapters (P. J. Thomas), the emphasis shifts from proteins as chemical compounds to the functional, biological properties of peptides and proteins. The characteristics of proteins as carriers, receptors, and hormones are treated along with methods of assaying these functions. Four chapters (C. Simpson) then describe in detail chromatographic and electrophoretic methods employed in the analytical and preparative separation, isolation, and characterization of amino acids, peptides, and proteins. After a brief consideration of the use and production of antibodies to proteins (A. W. Schram), the final four chapters are concerned with the processing and quality control of technologically important proteins. The methods for large-scale separation and isolation are considered both in general (P. J. Lillford) and for plant proteins in particular (C. Meyers). These authors then conclude with the procedures for characterizing the functional attributes of protein isolates, both in biochemical terms and for application in the food industry.

Most of the above subject matter can be found in other publications, but the value of this book is its unusual scope in collecting this material in one volume. The organization of the book gives a logical and concise treatment although the multiauthor nature of the work leads to some inevitable unevenness in detail and coverage. However, overall the monograph succeeds in presenting a unified consideration of the methodology that is relevant to protein technology. The citations to relevant literature are up to data and there are indices to both the proteins and subjects covered. Some previous knowledge of protein analysis, biophysics, and biochemistry is assumed, and with this in mind, the book will be valuable to research and development scientists involved in protein isolation, purification, characterization, and the setting and measurement of protein standards of performance.

Physiology & Biochemistry Department **Michael C. Phillips**
The Medical College of Pennsylvania
Philadelphia, Pennsylvania 19129

Phenylpropanolamine. A Review. By Louis Lasagna. Wiley, New York. 1988. xv + 440 pp. 16 × 24 cm. ISBN 0471-81977-8. $40.00.

It is unusual to devote an authoritative and extensively documented monograph of 455 pages to a single drug that has been around for almost 75 years and is consumed in the United States alone at an annual rate of 5 billion doses. It is even more unusual that this book is authored single-handedly by the dean (an administrative officer) of a major biomedical school who had earned his fame as the father of clinical pharmacology. One would expect that ancient data and references, gathered by outdated methods, would provide a dim history of this drug. Instead, the text comes alive throughout and leads us into a fascinating and diversified story of many pharmacological fields.

Phenylpropanolamine (2-amino-1-phenylpropanol, also called *dl*-norephedrine) was synthesized by F. W. Callies in 1912; its synthesis has been simplified and refined many times since then. First regarded as a mydriatic of doubtful value, its effects on the peripheral, autonomic, and the central nervous systems have been studied thoroughly. And therein lay its pitfall. Like most other CNS-active agents, phenylpropanolamine has been incorporated in "street drugs" and has caused alarm in psychiatry, in the FDA, and in the legitimate pharmaceutical industry which had long presented it as an effective drug in vasoconstriction, in cardiovascular therapy, and other adrenergic applications. By itself, phenylpropanolamine is not a euphoriant, but in combination with other drugs (alcohol, caffeine) it appears to play a role in illegitimate uses.

Sixty-five years is a long time for studying every activity of a drug. Lasagna has done a beautiful job recording critically these hundreds of investigations in the major areas of pharmacology. Inevitably, comparisons with other adrenergic agents had to be contemplated, and the review has branched out to a survey of older and contemporary autonomic and hormonal pharmacology. This book is bound to become a clasic and will soon be found on the desks of all biochemical and clinical pharmacologists.

Department of Chemistry **Alfred Burger**
University of Virginia
Charlottesville, Virginia 22901

Books of Interest

Advances in Electrophoresis. Volume 1. A. Chrambach. VCH Publishers, New York. 1988. ix + 441 pp. 17 × 24 cm. ISBN 895-73-669-1. $110.00.

Basic Biotechnology: A Student's Guide. P. Prave. VCH Publishers, New York. 1987. x + 344 pp. 17 × 24 cm. ISBN 3-527-26678-X. $29.95.

Improving Safety in the Chemical Laboratory. A Practical Guide. Jay Young. Wiley, New York. 1987. viii + 350 pp. 17 × 24 cm. ISBN 0-471-84693-7. $45.00.

International Conference on Circular Dichroism. Bulgarian Academy of Sciences. VCH Publishers, New York. 1987. vii + 442 pp. 15.5 × 22 cm. ISBN 0-89573-620-9. $60.00.

Leukolysins and Cancer. Janet H. Ransom. The Humana Press, Clifton, NJ. 1988. xviii + 344 pp. 16 × 23.5 cm. ISBN 0-89603-125-X. $69.50.

Pathology of Cell Receptors and Tumor Markers. G. Seifert. VCH Publishers, New York. 1987. 206 pp. 17 × 24.5 cm. ISBN 0-89574-249-7. $90.00.

The **Additives Guide.** Christopher C. Hughes. Wiley, New York. 1987. 146 pp. 13 × 20 cm. ISBN 0-471-91496-7. $37.95.

Drug Delivery Systems. Fundamentals and Techniques. P. Johnson. VCH Publishers, New York. 1987. 282 pp. 16 × 25 cm. ISBN 0-89573-580-6. $108.50.

Drug Delivery to the Respiratory Tract. D. Ganderton. VCH Publishers, New York. 1987. 141 pp. 17 × 24 cm. ISBN 0-89573-586-5. $95.95.

Modern Methods in Protein Chemistry. Volume 3. Review Articles. H. Tschesche. Walter DeGruyter & Co., West Germany. 1988. ix + 385 pp. 17 × 24 cm. ISBN 3-11-011216.7. DM 240.00.

Quantitative Bioassay. David Hawcroft, Terry Hector, and Fred Powell. Wiley, New York. 1988. xxiii + 300 pp. 15 × 12.5 cm. ISBN 0-471-91401-0. $26.95 (Pbk).

Carbohydrate Chemistry. Vol. 19, Part I. Senior Reporter: N. R. Williams. Royal Society of Chemistry, London. 1987. xii + 292 pp. 14 × 22 cm. ISBN 0-85186-222-5. $116.00.

Ion-Exchange Chromatography of Proteins. Vol. 43. Yamamoto, Nakanishi, and Matsuno. Marcel Dekker, New York. 1988. vii + 401 pp. 15.5 × 23.5 cm. ISBN 0-8247-7903-7. $110.00.

Psychopharmacology and Reaction Time. I. Hindmarch, B. Aufdembrinke, and H. Ott. Wiley, New York.