Book Reviews

Methods of Protein Microcharacterization. A Practical Handbook. Edited by J. E. Shively. Humana Press, Clifton, NJ. 1986. vii + 456 pp. 15.5 × 23.5 cm. ISBN 0-89603-090-3. $64.50.

This book provides an outstanding and highly detailed, practical laboratory handbook of techniques for microcharacterization of proteins. There has been a pressing need to compile such a volume, and this book documents applications of existing technologies as well as approaches to technical problem solving in this challenging and rapidly expanding field.

The 16 chapters in this book are organized into five parts: a section on microisolation techniques has chapters with reverse-phase HPLC microisolation and sequence analysis as well as polyacrylamide gel electrophoresis purification; a section on microamino acid analysis has two chapters, one covering post-column fluorescent derivation methods, the other covering pre-column o-phthaldialdehyde derivatization; a section on amino terminal analysis has chapters covering manual Edman sequencing, comparison of spinning cup and gas-phase sequencer instruments, design of a multipurpose sequencer, gas-phase protein/peptide sequencer, solid-phase protein microsequencing, HPLC analysis of phenylthiohydantoin amino acids, and purification of microsequencing chemicals; a section on carboxyl-terminal analysis has chapters on this type of microsequence analysis using enzymatic, chemical, and chromatographic methods; a final section on mass spectrometric analysis has chapters describing general GC–MS techniques for sequencing as well as fast atom bombardment and secondary ion mass spectrometric techniques.

This book has many remarkable features that make it uniquely useful and valuable to those attempting to develop appropriate methodology for microcharacterization of specific polypeptides or proteins: the text is elaborately detailed and thorough in its description of instrumentation design, set up and operation, preparation of reagents and precautions in their handling, system trouble shooting, examples of isolation, purification and sequence analysis of specific biologically active proteins or polypeptides, etc. Thus, as a practical handbook, it succeeds admirably. The editor has chosen the book's contributors exceedingly well, and in many cases the chapter authors, themselves, are the original developers of the techniques they describe.

This book suffers from evident shortcomings that relate to the manner in which the included material has been organized: There are many instances where material on the same subject can be found dispersed in several different chapters. In some cases, the material is repetitive, but in other cases, the individual chapters are not all inclusive, and information within another chapter contributes to a more comprehensive treatment of a specific subject. As an example, Chapter 10 on solid-phase methods in protein microsequence analysis has lengthy discussions on electrophoretic techniques that are dispersed throughout the chapter, and yet a previous chapter, 3, is devoted entirely to the subject of microgram protein purification by polyacrylamide gel electrophoresis. Another example is seen in chapters 6 and 11: In the former chapter on a manual Edman sequencing system, two very brief sections on Analysis of PTC–Amino Acids and Analysis of PTH–Amino Acids, discuss methods for analysis of the amino acids formed during Edman degradation; yet, it is in the latter chapter that one finds a comprehensive treatment of HPLC methods of analysis for phenylthiohydantoin amino acids derived from Edman degradation. Although one expects some problems in organization of material in a volume containing contributions from many authors, the editor does not seem to have seriously addressed these deficiencies. Additionally, although it is not a critical problem, just an annoying one, numerous typographical errors and omissions appear throughout the text.

The organizational deficiencies of this volume need not ultimately detract from its uniquely valuable contents, if the interested reader is aware of the need for careful perusal of its contents to cover a given subject thoroughly. Indeed, the editor has succeeded well in his intent to compile a comprehensive and exceedingly practical handbook. This book could very well become an indispensible laboratory manual for the many chemists, biochemists, and molecular biologists whose research requires the separation and sequencing of microgram quantities of peptides and proteins.

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Pharmacology in Medicine: Principles and Practice. Edited by S. N. Pradhan, R. P. Maickel, and S. N. Dutta. SP Press, Bethesda, MD. 1986. xii × 1087 pp. 21 × 27.5 cm. ISBN 0-9617129-0-2. $55.00.

The objective of this text is to be a source of drug information that is neither too voluminous and extensive nor too superficial. It is intended to provide not only new and up-to-date information about therapeutic agents but also to focus on new horizons of pharmacology. It is intended to be a "midsize" book that presents selective, current, and balanced information based on drugs as modifiers of physiological function. Each chapter goes beyond the traditional textbooks of pharmacology and provides new vistas by introducing chapters on topics varying from pharmacogenetics to peptides to radiation and drugs to systemic pharmacology, i.e., ocular pharmacology to environmental pharmacology and to over-the-counter drugs.

In each chapter there is presented a short table of contents, a brief introductory section, many tables, schematics, and figures to aid in the presentation of the subject matter in a readily comprehensible manner. The book is of multiauthorship, which of necessity presents some problems in presenting in a uniform, balanced, and flawless fashion all of the vast data in the first publication. Despite this obvious handicap, the chapters are well edited and reviewed, and as a consequence, are clearly and well written in a manner that easily compares with the traditional texts in pharmacology and medicinal chemistry.

The book is comprised of seven sections: "General Principles", "Drugs Affecting Regulation of Function", "Drugs Affecting Regulation of Function", "Drugs Affecting Systemic Functions", "Drugs Acting via Cytotoxic and Therapeutic Mechanisms", "Environmental Pharmacology and Toxicology", and "Special Areas in Pharmacology". In my opinion, each of these sections in well written, as up-to-date as reasonable, and remarkably free of errors. Of necessity the chapters are somewhat sparsely referenced. The index is brief, but adequate for its purpose.

In this reviewer's opinion, this is a very useful book that supplements more detailed texts in the field in a manner that should be beneficial to medical students, practitioners, medicinal chemists, pharmacologists, and those of related disciplines. It should provide not only a useful text for students but an introduction for scientists of various other disciplines concerned with therapeutic agents. As a medicinal chemist I definitely value this book in a readily accessible location either in a personal or in an institutional library. It is unquestionably a bargain at its price.

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Regulation of Immune Gene Expression. Edited by M. Feldmann and A. McMichael. Humana, Clifton, NJ. 1986. xiii + 359 pp. 15 × 23 cm. ISBN 0-89603-104-7. $64.50.

The complex field of immune regulation is undoubtedly at the crossroads of several disciplines pertaining to the drug discovery

process. This book clearly outlines the latest state-of-the-art status of central issues germane to the proper understanding of immune regulation. In this context, the editors have done a splendid job of compiling research articles from leading authorities in this area.

The book is divided into six sections dealing with molecular basis of MHC (pp 3–74), molecular basis of lymphocyte activation (pp 75–136), molecular analysis of T-cell receptors (pp 137–186), antigen presentation (pp 187–236), HLA and disease (pp 237–274), and T-cell repertoire (pp 275–319). These articles represent a substantial portion of the proceedings of a conference held at Trinity College, Oxford on September 21–25, 1985. The coverage on various topics in these articles is broad, thorough, and timely; the problems addressed are in the mainstream of research activities on immune regulation. Despite staggering advances in cell biology, it has been made abundantly clear in this book that the researchers are still probing the solution to fundamental problems such as receptor–ligand interactions, cell activation, and cell proliferation at the qualitative and quantitative level.

Perhaps, the quality of this book is adequately accentuated by incorporating well-written workshop summaries of the total number of papers presented at this conference. These summaries are in six categories, namely: relationship of idiotypes and MHC networks (pp 323–327), the relationship of T-cell receptors and factors (pp 329–334), T–B cell interactions (pp 335–337), regulation of antigen presentation and T-cell subsets (pp 339–340), transfection of MHC genes (pp 341–345), and tolerance and development of T-cell repertoire (pp 347–349). In essence, these summaries should provide an excellent overview of the subject matter in the area of immune regulation. The authors of these summaries should be complimented for distilling the proceedings of this conference for maximum benefits to the readers.

The book is virtually devoid of any typographical error with the exception of nsulin for insulin (p 353). Unfortunately, the usage of words such as hybridization vs. hybridisation, tumor vs. tumour is not consistent throughout the book. This causes a little bit of confusion when one glances through the subject index, e.g., the word "tumour" (pp 146–315) is replaced with the word "tumor" in the index (p 359). Barring this minor criticism, its conciseness and clarity of presentation of fundamental issues in immune regulation should make it a valuable reference book for researchers involved in immunology in general, and especially for pharmaceutical industries involved in immunotherapeutics. More importantly, for the development of immunochemistry, this book with up-to-date references should provide good reading material for medicinal chemists. Considering the high intensity of research activity in this area, this book will have to be updated by another volume within 2 years.

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Toxicology of the Nasal Passages. Edited by Craig S. Barrow. Hemisphere Publishing Corp., Washington, DC. 1986. xiv + 317 pp. 15 × 23 cm. ISBN 0-89116-397-2. $61.95.

This book is part of the Chemical Industry Institute of Toxicology (CIIT) series, and is the result of the Seventh CIIT Conference on Toxicology, "Toxicology of the Nasal Passages", February 1984. The nasal passages as a target organ for toxicity, as well as a site of absorption and metabolism of toxic chemicals, have received relatively little attention until recently. It was the intent of the Seventh CIIT Conference on Toxicology to summarize information regarding the structure and function of the nasal passages as they relate to toxicology, as well as provide both animal and clinical data on the toxic effects of specific chemicals on the nasal passages.

While there has been a longer-than-usual delay in the publication of the book resulting from this conference, it appears to be worth the wait. The number and quality of the illustrations, relative consistency of style among chapters by multiple authors, and the incorporation of a number of well-written introductory chapters have made this a much better than average conference-derived text.

The first five chapters deal with the comparative anatomy and function of nasal passages, detailed descriptions of nasal passages in the rat at both the light microscopic and electron microscopic levels, and the histopathology of acute, subacute and chronic nasal toxicity. Chapters 6–8 and 18 address nasal irritation produced by airborne chemicals, and include some structure–activity relationships and extrapolation methods pertinent to risk estimation. Chapters 10 and 11 present effects of chemical exposure on nasal function and olfaction in humans, and Chapters 12–16 cover the absorption and metabolism of chemicals by the nasal passages, including the bioactivation of toxic compounds. Chemical carcinogenicity in the nasal passages is specifically addressed in Chapters 5, 9, and 17.

While *Toxicology of the Nasal Passages* is based on information published during or before 1984, this does not seriously detract from its value as an excellent overview of an important area of toxicology. Though this book is not likely to have wide appeal, it nonetheless can serve as a valuable resource for pharmacologists, toxicologists, and medicinal chemists interested in the toxic effects of drugs and chemicals on the respiratory tract.

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Radicals in Organic Synthesis: Formation of Carbon–Carbon Bonds. By Bernd Giese. Pergamon, Oxford. 1986. xiii + 294 pp. 15 × 23 cm. ISBN 0-08-032494-0. $25.00.

The subject of carbon–carbon bond forming reactions is one of central importance to those chemists engaged in the target-orientated synthesis of organic molecules. Homolytic or radical reactions that lead to carbon–carbon bond formation have been extensively exploited in polymerization processes, but it is only in very recent times that they have achieved prominence in the arsenal of the synthetic organic chemist. The author of the present monograph is a seminal contributor to the area and is aptly qualified to acquaint the reader with the scope and limitations of this new methodology.

Following a very brief historical perspective, Chapter 2 outlines some of the basic principles of radical reactivity pertinent to the use of such species in the synthesis of complex, multifunctional, organic molecules. Chapters 3 and 4 are devoted respectively to the inter- and intramolecular formation of aliphatic carbon–carbon bonds, while Chapter 5 deals with carbon–carbon bond formation in aromatic systems.

In the final chapter, methods of carbon-centered radical formation are categorized according to the type of bond undergoing homolytic cleavage in their progenitors. This section is extremely useful since for each of the methods under consideration page numbers, within the text, are cited where detailed discussions and examples are to be found. Mechanistic details, particularly in the area of radical chain reactions, are dealt with admirably in the text and are of course of crucial importance in the adaptation of this methodology toward a particular synthetic goal. The text is well supported by over 450 references which cover the literature to mid-1986.

This excellent monograph will be of practical value to all synthetic chemists considering the use of this methodology.

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Bio-Organic Heterocycles, 1986. Synthesis, Mechanisms and Bioactivity. Proceedings of the 4th FECHEM Conference on Heterocycles in Bio-Organic Chemistry, Houthalen, Belgium, 25–28 May 1986. Edited by H. C. van der Plas, M. Simonyi, F. C. Alderweireldt, and J. A. Lepoivre. Elsevier, Amsterdam. 1986. xi + 325 pp. 16 × 24 cm. ISBN 0-444-42711-2. $94.50.

Like many other symposium volumes, these proceedings contain (seven) plenary lectures and (28) posters reproduced by offset type. The heterocyclic compounds discussed are called bioorganic but the only feature they have in common is that they occur in

natural sources and are therefore products of metabolism. A few of them have medicinal properties; most of them do not.

A subtitle of the book is "Studies in Organic Chemistry". Indeed, most of the posters are descriptions of organic chemical methods of synthesis of various heterocyclic compounds, whether occurring naturally or of synthetics related to such substances. These syntheses, mostly carried out by traditional methodology, may be useful examples of constructing specific heterocycles with appropriate functional substituents. By contrast, the plenary lectures present careful surveys of the biochemistry of porphyrine enzymes, certain antibiotics (ambruticin), alkaloids, modified nucleosides, and intercalating antitumor agents. In conformity with the purpose of the symposium, synthetic access to many of these agents is stressed but not at the expense of biochemical causation and molecular function.

The book is expensive but should be on the shelves of libraries of organic and biochemistry departments.

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Macromolecules as Drugs and as Carriers for Biologically Active Materials. Edited by David A. Tirrell, L. Guy Donaruma, and Anne B. Turek. The New York Academy of Sciences, New York. 1985. Volume 446. ix + 458 pp. 15 × 23.5 cm. ISBN 0-89766-286-5. $105.00.

This is a valuable compilation of review articles on macromolecules (synthetic copolymers, polysaccharides, polyanions, antibodies, and liposomes) as drugs and as drug carriers. About a half-dozen of the 35 individual review articles are devoted to the actual pharmacologic properties of copolymers with the majority of the articles devoted to macromolecules as drug delivery systems. The 35 articles are divided into three general areas: controlled release of drug from insoluble matrices, release of drugs from soluble macromolecules, and liposomes as carriers of biologically active materials. The editors have done an excellent job of organizing the various chapters in a way that allows the many chapters to run smoothly in a logical train, despite the numerous approaches under review. The informative and sometimes lively discussion following the individual chapters is also well edited. The Author Index appears complete, but there is no Subject Index.

The book implicitly illustrates the evolution of drug delivery systems in the 1980s as opposed to delivery systems of the 1970s. Ten years ago liposomes were much in vogue as a new drug delivery vehicle. Now it is clear that liposomes largely direct drugs selectively to the reticular–endothelial system with little distribution to other organs, particularly if the liposome is on the order of 0.5 μm. Smaller liposomes (e.g., 0.05 μm) have a greater extravascular distribution, but still these structures are large (500 Å) compared to the size of pores within most organ microvasculatures. Drug delivery systems evolving in the 1980s are becoming increasingly dependent on fundamental cell biology and receptor-mediated endocytotic mechanisms. Drug delivery systems that take advantage of the specificity of receptor-mediated uptake mechanisms have greater opportunities for targeted drug delivery. Indeed, the chapters discussing the coupling of target-specific antibodies to liposomes illustrate that even the liposome area of drug delivery will require expertise in cell biological mechanisms. Thus, volumes such as this might be improved by chapters describing the principles of receptor-mediated endocytosis of peptides and plasma proteins, as well as chapters on the mechanisms of macromolecule transport across capillary barriers. Hopefully, drug delivery systems in the 1990s will see a fusion of polymer chemistry and cell biology.

Finally, this volume did not escape the inevitable: delays that attend the preparation of the proceedings of such a meeting. The meeting was held in March of 1984, and although the volume is listed with a 1985 publication date, it apparently was not issued until late 1986 and was not listed in Current Contents until December of 1986.

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Henderson's Dictionary of Biological Terms. Ninth Edition. Edited by Sandra Holmes. Van Nostrand Reinhold, New York. 1986. xi × 510 pp. 13 × 20 cm. ISBN 0-442-23160-1. $29.95.

As medicinal chemistry is a multidisciplinary science, and considering the marked expansion in research in the biological sciences, it is virtually impossible for most medicinal chemists to keep abreast of the new vocabularies (terms) that have evolved in the various sciences. Indeed, in the 16 years since the last publication of the eighth edition of *Henderson's Dictionary of Biological Terms* there not only has been a marked expansion of research in biological sciences but important new branches of biology have evolved; others have expanded and some have come to maturity. As a consequence, definition of new terms in the latest edition is extensive. In addition to the definition of new terms, there are some deletions and redefinition of existing ones with the result that there is almost a 35% increase in new terms that are defined. Definitions are consistently of a nature that they should be readily comprehensible to almost all medicinal chemists.

For my use in reading the medicinal chemical literature, I appreciate having this dictionary of biological terms at my fingertips. I strongly recommend this dictionary for personal libraries, or at least for the ready accessibility, of all medicinal chemists.

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