Book Reviews

Principles of Process Research and Chemical Development in the Pharmaceutical Industry. By Oljan Repic. John Wiley & Sons, New York. 1998. xvi + 213 pp. 16 × 24 cm. ISBN 0-471-16516-6. $74.95.

The first impressions one gets in reading this book are twofold. First, it is a thorough, well-written account of the principles underlying the related fields of process research and chemical development. This discourse is presented by a highly qualified and experienced author, often with a refreshing sense of humor (for example, chapters on product purity and resourcing the chiral pool are entitled "Impure Thoughts" and "Au Naturel", respectively). Second, this important contribution meets a real need for an in-depth description of chemical process R&D and should prove very useful to graduate students deciding between careers in either medicinal or process chemistry. In addition, entry level process chemists can jump-start their on-the-job training with a thorough study of the principles elaborated in this text. Finally, medicinal chemists will appreciate the challenges that are faced in real-world process chemistry.

After a stimulating foreward by Dr. Thomas J. Blacklock, which sets high expectations for the chapters to follow, the author describes the ideal plant process in Chapter 1, setting the stage for the remainder of the text which employs a large number of "case studies" to exemplify various efforts to approach the ideal. Chapter 2 is devoted to troubleshooting impurities, described as "a most exciting activity in chemical development". Indeed, no less than 20 informative examples are used to illustrate the sleuthing that is required to identify impurities in drug intermediates and product, determine their origin, and, on the basis of a deep understanding of reaction mechanism, either avoid their production entirely or at least rigorously control their level.

The next chapter recounts the process history of Lescol and traces 10 years of the chemical development of this product, affording the definitive example of the central thesis of this book. The next three chapters focus on the various methodologies for the production of enantiomerically pure drug substances. All the established approaches and technologies are discussed and again fortified with many instructive examples. After a useful chapter on isotopic labeling of drug candidates, an important discussion of the regulatory environment which embraces chemical development is presented. The text concludes with a set of speculations on the future of process R&D in which catalytic monoclonal antibodies are an important component of the synthetic organic chemist's toolbox.

In summary, this book is a valuable contribution and an important addition to the library of the pharmaceutical chemist. The wealth of information presented in the easy-to-read 213 pages is timely, relevant, and presented in a clear, instructional format, literally bristling with pertinent examples. I enthusiastically recommend the text to all current and potential process R&D chemists in the pharmaceutical industry.

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Glycoanalysis Protocols. Edited by Elizabeth F. Hounsell. Humana Press, Totowa, NJ. 1997. x + 262 pp. 15.5 × 23.5 cm. ISBN 0-896-0335-4. $64.50.

This book is Volume 76 in the Methods in *Molecular Biology* series, edited by John M. Walker for Humana Press. This second edition focuses less on clinical chemistry and more on the advances in the analysis of glycoconjugates prepared by biotechnological methods. The book consists of 15 multiauthored chapters covering topics including O- and N-linked glycoproteins (Chapters 2 and 3); lectin- and exoglycosidase-based analysis (Chapters 3 and 4); glycan analysis by chromatography, electrophoresis, and resonance energy transfer (Chapters 5−8 and 15); and analysis of glycosaminoglycans, proteoglycans, mucins, glycosphingolipids, and glycophosphatidylinositols (Chapters 9−14).

The chapter format is uniform and consists of an introduction, a detailed materials section, a step-by-step methods section, notes on the fine points of analysis, and a reference section. While the adherence to a uniform format makes this book better than many multiauthored texts, it still suffers from uneven quality. Some of the authors are clearly the leading experts in the fields they cover, but some are not. This unevenness shows as key procedures are omitted from some of the chapters. In addition some subject areas such as capillary electrophoresis in glycan analysis are simply not covered. The coverage of nuclear magnetic resonance and mass spectrometric analysis of glycans, while well-presented by the editor in the brief introductory chapter (Chapter 1), probably would have been better presented in separate chapters.

The first half of the book focuses on methods generally valuable to laboratories just beginning work in the glycosciences. The methods are described clearly and in sufficient detail for those inexperienced in the field. The second half of the book is more highly specialized and might be of more use to laboratories currently active in glycoanalysis. The text, while well-referenced, would benefit from a listing of key references. The many existing recent reviews and books in the field of glycoanalysis are simply not referenced. The index is well-constructed, and the text appears to be relatively free of substantive errors.

The book is recommended to both scientists just beginning glycoanalysis as well as to experts in the field. It certainly belongs in the laboratory and the libraries of both academia and industry.

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Pharmacology of Antimuscarinic Agents. By Laszlo Gyermek. CRC Press, Boca Raton, FL. 1997. xx + 501 pp. 16 × 24 cm. ISBN 0-8493-8559-8. $129.95.

This book is an extensive review on different aspects of the origin, history, pharmacology, and uses of antimuscarinic agents. The author devoted different sections to (1) mechanisms of action of antimuscarinic agents; (2) tropane alkaloids in their pharmacological actions on different organs innervated by parasympathetic nervous systems; (3) central effects of atropine including modification of behavior; (4) semisynthetic derivations of tropane alkaloids; (5) synthetic antimuscarinic agents; (6) clinical pharmacology and therapeutic uses; and (7) toxicity of standard antimuscarinic agents, atropine.

Modern developments in drug design have provided sensitive antagonists for muscarinic receptors in different tissues. These antagonists have become useful to subdivide muscarinic receptors into four (M_1−M_4) and possibly five or more subtypes. Several antimuscarinic antagonists are selective (not specific) to one subtype of muscarinic receptors. The author has made a special effort to list different antimuscarinic agents and their selectivity, if any, to the muscarinic receptor subtypes. Antagonists at M_1−M_4 receptor sites may be useful in the treatment of hypersecretion of exocrine glands (M_1), bradycardiac heart syndrome (M_2), abnormalities of smooth muscle functions of visceral organs (M_3), and smooth muscle spasms of respiratory tract (M_4), respectively. The selective use of M_5 receptor antagonists is not yet defined. There is need for the development of selective antimuscarinic agents for the muscarinic receptors in different locations of central nervous system. The author is successful in bringing together information on the antimuscarinic agents selective to different types of muscarinic receptor. This volume will provide a necessary stimulus to create more research in developing new specific antimuscarinic agents to different subtypes of muscarinic receptors.

An extensive list of referenes (114 pages) to discuss the pharmacology of antimuscarinic agents (359 pages) makes this book a rich resource on this topic. According to the author, his list of references may not be complete, so other authors whose work was not cited were invited to submit necessary information and references. Some references on structure−activity relationships may have been omitted. However, it does not fall short of meeting the requirements of many scholars interested in this subject matter.

In general, this book represents an excellent effort on the part of the author to present well-written authoritative information on antimuscarinic agents. The book is a useful addition to any medical library which serves teachers, researchers, and medical personnel who use anti-muscarinic agents. The book is recommended for biomedical scientists in pharmacology and drug-development professions.

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Approaches to Design and Synthesis of Antiparasitic Drugs. By Satyavan Sharma. Edited by Nitya Anand. Elsevier Science B.V., Amsterdam. 1997. xi + 511 pp. 17 × 25 cm. ISBN 0-444-89476-4. $265.75.

This book is Volume 25 in the "Pharmacochemistry Library" series edited by H. Timmerman. A descriptive introduction to parasitic diseases is presented in Chapter 1. The remainder of the book is divided into two sections, the first on anthelmintic agents and the second on antiprotozoal agents. Chapters 2−12 form the Anthelmintic Section (278 pages) and are titled Biochemical Targets for Anthelmintic Activity, Natural Products, Organometallics, Piperazines, Tetrahydropyrimidines, Imidazothiazoles, Benzimidazoles, Salicylanilides, Nitroaryl Compounds, Tetrahydroquinolines and Isoquinolines, and Miscellaneous Anthelmintics. Chapters 13−21 form the Antiprotozoal Section (163 pages) and are titled Biochemical Targets for Antiprotozoal Activity, Natural Products, Organometallics, Quinolines, Nitroheterocycles, Antifolates, Bisamidines, Haloacetamides, and Miscellaneous Antiprotozoals. There is an adquate subject index, but no author index.

As is apparent, the chapters are conveniently organized according to structural class. Most of the chapters, especially those in the anthelmintic section, are divided into five major subheadings: (1) Introduction; (2) SAR; (3) Synthesis; (4) Biological Activity; and (5) Mode of Action. However in some chapters, especially those in the antiprotozoal section, not a word is mentioned about mode of action. This flaw is exemplified in the chapter on antiprotozoal quinolines in which an assessment of the voluminous literature on the mode of action of chloroquine and other 4-aminoquinolines has been entirely omitted.

Although the quality of this single-author text is quite good, the book is somewhat dated as the most recent references are from the early 1990s. For example, there is no mention of the naphthoquinone drug atovaquone,