

(Chapter 2), traceability and reference materials (Chapter 3), and the analytical process (Chapter 4). Chapters 5 and 6 then discuss qualitative and quantitative aspects respectively. "The Analytical Problem" (Chapter 7) and "Analytical Chemistry and Quality" (Chapter 8) are the subjects of the last two chapters. A very comprehensive 23-page glossary of the most important analytical terms is an important feature at the end of the book. Links are provided to those chapters in which particular terms are introduced or discussed in detail. A list of symbols and abbreviations used in the text completes the book.

My personal opinion on the general conception of the book is mixed. On the one hand, the book is valuable for introducing to students those characteristics of analytical chemistry that are not generally understood by chemists from other fields who rely on results from analytical methods. On the other hand, despite the technical quality, the concept is very theoretical and therefore difficult to understand for students in their first years. Unfortunately, the book does not sufficiently illustrate the importance of the subject in supporting experimental chemistry. The newcomer to analytical chemistry would gain a better understanding of the author's discussions if they were illustrated by examples of analytical applications. The appeal of analytical chemistry for students is based to a large extent on the relevance of this discipline to practical problems. Therefore, I do not share the author's opinion that this book is particularly valuable for persons who come into contact with analytical chemistry for the first time.

However, this does not mean that I would not recommend this book at all. On the contrary, it complements the large number of textbooks on analytical chemistry in an excellent way. Those aspects which are strongly emphasized by Valcárcel tend to be neglected in many textbooks. As a university teacher of analytical chemistry, I will certainly incorporate into my lectures the important and well-structured general aspects of analytical chemistry as presented by the author. A table at the beginning of Valcárcel's book is a very helpful tool in this matter: the author recommends which contents of his book should be considered, depending on the available

time. This is particularly valuable in view of the wide variations in the position accorded to analytical chemistry in the curricula of different countries. For advanced students who are majoring in analytical chemistry, much of the material suggested by Valcárcel can be taught in parallel with analytical applications.

Therefore the book is a valuable tool for all university teachers in analytical chemistry, and it can also be recommended to advanced students or graduate students in this field.

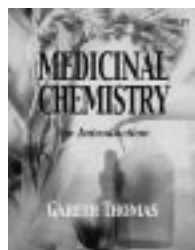
Uwe Karst

Anorganisch-Chemisches Institut
Universität Münster (Germany)

Medicinal Chemistry. An introduction. By *Gareth Thomas*. John Wiley & Sons, Inc., New York 2000. xxvii + 539 pp., paperback \$ 45.00.— ISBN 0-471-48935-2

This textbook on medicinal chemistry is intended for students of chemistry, biology, medicine, pharmacy, and pharmacology. It provides an introduction to the principles of pharmaceutical agents, their modes of action, and their development. To understand the contents requires a basic knowledge of chemistry, and of other sciences to some extent, even though many elementary principles of biochemistry are explained within it.

The 12 chapters cover many different aspects of pharmaceutical research and development. Chapter 1 gives a brief overview of some of the topics treated, and provides introductions to a few aspects that are covered in detail in the following chapters. It also gives a little information about some topics that are not treated in detail in the rest of the book, such as the clinical development of drugs. Chapter 2 describes the many different strategies that are used in modern pharmaceutical research and development, such as SAR, QSAR, CAD, and combinatorial chemistry. Chapter 3 discusses in detail the problems associated with the solubility of



drugs in water and lipids. That provides the background for Chapter 4, which is concerned with the structure of biological membranes and their importance in relation to the effectiveness of drugs. The molecular mechanisms of some antibiotics are also considered in this context. Chapter 5 then presents the fundamentals of pharmacokinetics. Chapters 6, 8, and 10 are involved in the fundamental mechanisms of particular classes of drugs: enzyme inhibitors (Chapter 6), drugs for the blocking or activation of receptors (Chapter 8), and drugs that interact with DNA and RNA (Chapter 10). These chapters also explain the biochemical principles needed to understand the discussions, including the mechanisms and kinetics of enzyme-catalyzed reactions, the structures and distribution of receptors, the structures and functions of nucleic acids, the flow of genetic information, and the structures of viruses. Chapter 7 is devoted to metal complexes and their importance in the interaction of drugs with target structures in organisms. Chapter 9 deals with some important aspects of the metabolism of drugs, including also the pro-drug principle. Lastly, Chapter 12 discusses synthetic aspects, with particular emphasis on the stereoselective synthesis of organic compounds. Whereas all the above chapters explain general principles and illustrate them with examples, the penultimate chapter, Chapter 11, is a special one devoted to nitrogen monoxide, a small molecule with far-reaching effects. The chemical reactions and properties of NO are described, followed by its importance in organisms, as well as its therapeutic possibilities.

The book presents the organic principles and reactions that are important in the development of drugs and in their effectiveness. The reader learns which structural elements of an organic compound can make it a useful active agent. Pharmacodynamic and pharmacokinetic aspects are considered from the standpoint of chemical structure. This new textbook offers a concise, but nevertheless easily understandable, presentation of many aspects of drug mechanisms and drug development. It first gives the reader a basic knowledge of the fundamentals, then illustrates the principles by focussing on specific drugs. The book also gives insights into many widely

different topics, such as QSAR, stereoselective synthesis, and combinatorial chemistry. The theoretical discussions are reinforced by describing many important practical examples. Summaries and exercise questions are given at the end of each chapter to help the reader's learning and understanding. The book is mainly suitable for students of chemistry, biochemistry, biology, and pharmacology, and will introduce them to the fundamentals of drug action and drug development. It can also be recommended for those studying pharmacy, as a valuable resource that collects together many relevant aspects and can be used alongside the usual pharmaceutical chemistry textbooks. Advanced students and pharmaceutical chemists will also find that it contains a wealth of information in a compact form.

Tanja Schirmeister
Institut für Pharmazie und
Lebensmittelchemie
Universität Würzburg (Germany)

New Trends in Synthetic Medicinal Chemistry. (Series: Methods and Principles in Medicinal Chemistry, Vol. 7.) Edited by *Fulvio Gualtieri*. Wiley-VCH, Weinheim 2000. xv + 353 pp., hardcover DM 248.00 (ca. 126 Euro).—ISBN 3-527-29779-5

In this seventh volume of the series *Methods and Principles in Medicinal Chemistry*, 19 authors from academia and industry have aimed to identify new trends in synthetic medicinal chemistry. In the last few years the number and complexity of the tools available to the medicinal chemist have increased dramatically. High-throughput screening, combinatorial chemistry, biotechnology, and computer modeling are some of the

key developments that have influenced and altered the thinking and the working methods of chemists in the pharmaceutical industry to an extent never seen before. The editors have taken on the difficult task of providing an up-to-date overview of this ever more rapidly advancing field.

A short introduction by the editor (F. Gualtieri) is followed by a chapter on computer modeling supported design, for identifying those molecular series that can yield the most useful information. The authors give an interesting introduction to this theoretical aspect of medicinal chemistry, which should stimulate readers to dig deeper into the topic. The next two chapters outline the fundamentals of combinatorial chemistry, but unfortunately they fail to cover some important recent developments. The treatise is essentially limited to an account of the beginnings of this branch of chemistry, with the main emphasis on the encoding of compound libraries. On the other hand, the detailed descriptions of commercially available automation systems that follow will be useful for some readers.

About 50% of the pharmaceutical agents currently undergoing development are enantiomerically pure compounds, and accordingly two excellent chapters are devoted to the synthesis and isolation of chiral compounds. By relating the discussion to practical examples, the authors enable the reader to assess the relative importance of the many different methods for preparing enantiomerically pure compounds. The detailed description of methods for kinetic separation of racemates serves as a good introduction to the following chapter on biotechnological syntheses. This conveys a good basic understanding of the technological importance of biocatalytic processes, and discusses some recent examples from the literature.

The last two chapters of the book are devoted to two classes of biopolymers which, despite the difficult syntheses involved, have recently attracted growing interest from pharmaceutical research groups because of their pharmacological activity and potential. The first chapter, on the synthesis of oligosaccharides, offers only a superficial treatise of protecting group strategies and glycosylation methods. In contrast, the second chapter, on oligonucleotides, is excellent and contains a wealth of important information, as well as being the longest and by far the most interesting in the book. The authors cover the topic comprehensively, from the beginnings of oligonucleotide synthesis to the successful introduction of the first antisense drug licensed for clinical use.

Although the overall concept is good, like any multiauthor work the book suffers from a certain lack of consistency in the presentation, with variations in the quality of the chapters, and some overlapping of material in the first part. Also the quality of several of the figures (of which all but two are black-and-white) falls short of the best modern standards. Also some chapters show evidence of having been produced under time pressure (e.g., place markers not removed, figures interchanged or even missing, and incorrect citation of well-known authors).

To summarize, the book gives the reader an insight into some important new aspects of medicinal chemistry. It succeeds well for some parts of the subject, but it has a few weaknesses. Prospective buyers must consider carefully whether this work meets their needs.

Olaf Ritzeler, Jörg Habermann
Aventis Pharma Deutschland GmbH
Frankfurt am Main (Germany)