Book Reviews[*]

Molecular Biology in Medicinal Chemistry, Volume 21. Edited by T. Dingermann (Johann Wolfgang Goethe-University), D. Steinhilber (Johann Wolfgang Goethe-University), and G. Folkers (ETH Zürich). Wiley-VCH, Weinheim. 2004. xxi + 413 pp. 18 × 24 cm. $175.00. ISBN 3-527-304431-2.

As both the series editors and the volume editors essentially ask in their Preface and Foreword, respectively, "what is a volume dealing with molecular biology doing in a series on methods and principles in medicinal chemistry?" By the end of this excellent book, the question is effectively answered in that there has been a paradigmatic shift in the last few years. The advent of the genomic information explosion, coupled with new knowledge on the intricacies of the eukaryotic cell cycle and the utilization of "chip technologies" with bound DNA, RNA, and peptides/proteins in drug discovery and development, requires that medicinal chemists must be aware of the utility and also the problems associated with the use of, and information from, molecular biological techniques.

To this end, the editors have assembled a well-qualified group of scientists (predominately from Germany, but also including Dutch and Swiss researchers), to address three basic areas of the interface: molecular targets from a cellular perspective, stereospecific synthesis of natural products and their mimics, and the synthesis of DNA-derived or protein-derived drugs. The latter two are followed by discussions of analytical techniques, including protein-derived affinity systems and NMR of labeled proteins and peptides to determine structures and interactions. The final section deals with pharmacogenomics and toxicogenomics, areas that, at first blush, might not be considered as falling within the bailiwick of medicinal chemistry. However, a little thought applied to the routes of elimination of a given drug may well lead to modifications that will either enhance or retard such metabolism/elimination.

Although there are various misspellings and some interesting sentence construction in almost every section, the overall standard of English is excellent; certainly the ability of the authors to compose in a foreign tongue is amply demonstrated. I would be very surprised if a comparable group of U.S.-based scientists could do the same in another language. All sections contain up-to-date references (i.e., up to the middle of 2002), a pleasant contrast to other books in certain review series.

Overall, this is a book that should definitely be on the shelves of a modern practitioner of medicinal chemistry, particularly if he/she is involved in either teaching graduate students or drug discovery and development programs in any disease modality.

David J. Newman

National Cancer Institute
Frederick, Maryland

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[*]Unsigned book reviews are by the Book Review Editor.

Managing Scientists. Leadership Strategies in Scientific Research, 2nd Edition. By Alice M. Sapienza (Simmons College). Wiley-Liss, Inc., Hoboken. 2004. xiii + 246 pp. 6 × 9 in. $39.95. ISBN 0-471-22614-9.

This book seeks to provide scientists (and engineers) with some fundamental understanding and guidance about leading and managing scientists. The author operates from the premise that few scientists undertake graduate education because they want or plan to lead other scientists, and yet most scientists are thrust, sooner or later, into management roles whether they seek such responsibility or not.

Early chapters lay an appropriate foundation for the book, reviewing surveys conducted by the author; characteristics of good and bad laboratories and leaders; the ethnic, cultural, and genetic (significant numbers of foreign and female scientists) diversity or lack thereof (poor representation of African Americans, Native Americans, and Hispanic Americans); and the principal challenges faced by managers.

The meat of the book lies in chapters on discerning and understanding what motivates scientists; different leadership styles; different corporate or organizational cultures; effective (versus ineffective) communication; scientific creativity and the factors that influence it (the preceding topics); and dealing with conflict. Interwoven with these chapters are two on project management and leading change.

There are a lot of practical, common sense suggestions or ideas in this book, as well as a number of thought-provoking concepts and interpretations. Scientists are likely to find parts of the book very absorbing and a few parts rather dry reading, but for any scientist who aspires to be a better leader or manager, of either projects or people or both, this book should be a very useful exploration.

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The Systematic Identification of Organic Compounds, 8th Edition. By R. Shriner, C. Hermann, T. Morrill, D. Curtin, and R. Fuson. John Wiley & Sons, Inc., Hoboken, NJ. 2004. ix +723 pp. 21 × 32 cm. $102.95. ISBN 0-471-21503-1.

Christine Herrmann has provided a comprehensive update of the 7th edition of this venerable and useful volume, whose original edition by Ralph Shriner and Reynold Fuson was published in 1935, nearly 70 years ago. Even the inside of the cover has been altered to more appropriately list the classification tests by functional group, rather than by reagent, as was done in the 7th edition. Overall, Herrmann's improvements make this a useful text for the qualitative organic course and a useful reference book that will also serve a variety of labs.

The 8th edition includes thoroughly revised and expanded spectroscopy sections, now placed in separate chapters. The mass spectrometry treatment has doubled, while the NMR section has tripled. The former now includes greater attention to fragmentation pathways,

while the NMR section treats many useful experiments that are now common, including COSY, HETCOR, and DEPT. By placing the NMR chapter first among the chapters on spectroscopy, Herrmann has subtlely signaled the relative importance of this kind of spectroscopy to organic chemists. The infrared chapter includes only a description of FT-IR instruments. In place of several large-format IR spectra of limited utility Herrmann has included several pages of useful functional group−IR band correlations. Unfortunately, any mention of UV spectroscopy has been omitted from the 8th edition.

In the first sentence of the Mass Spectrometry chapter, the author states, "Mass spectrometry is of lesser importance than NMR and IR spectroscopy." In the 21st century this is arguably not true, especially for IR spectroscopy, even in a qualitative organic laboratory. The statement reflects a rather parochial point of view that is unfortunate in my opinion. Advances in mass spectrometry have made the technique highly complementary to NMR spectroscopy and clearly more powerful than IR. Combined techniques such as GC/MS have brought mass spectrometry to most undergraduate colleges, and students in earlier courses, as well as qualitative organic courses, are using this technique.

This volume provides a great deal of valuable material. The extensive appendices retain the Handy Tables for Organic Laboratory, and the Tables of Derivatives that have been the hallmark of every edition have been reformatted to make them more readable. There are also more problems, particularly in the spectroscopy sections, to go along with the problem sets in Chapter 11.

It is not clear, however, what the demand for such a volume would be. Many chemistry departments no longer teach a course in qualitative organic chemistry, preferring instead to introduce students to research early in their undergraduate careers or to offer courses exposing the students to some of the diverse newer areas in chemistry, such as nanoscience or bioinorganic chemistry. Nevertheless, for those colleges and universities that continue to offer Qualitative Organic Chemistry, as well as for any good chemistry library, Herrmann has provided a significant improvement over the 7th edition that provides valuable and helpful material.

Robin B. Kinnel

Hamilton College
Clinton, New York

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Understanding Mass Spectra. A Basic Approach. 2nd Edition. By R. Martin Smith (University of Wisconsin). Wiley-Interscience, Hoboken, NJ. 2004. xviii + 372 pp. 16 × 24 cm. $79.95. ISBN 0-471-42949-X.

In the preface of the book, the author poses the question of why anyone would want or even need to understand mass spectra, given that several large, readily accessible databases already exist, databases that can be automatically searched for a match to identify a chemical entity. The answer is that just about anything can be matched to something, although the conclusion may not be scientifically defensible. Hence, as Ron Daniel once said, "The best practice is semi-automation, where a machine suggests something, and people look at it to correct the errors." One purpose of this book is to present the underlying concepts of mass spectra so that results obtained by automatic evaluation may be checked manually. Second, since all known chemical entities do not have a mass spectrum in the public domain, and not all chemical entities are known, new mass spectra obviously rely completely on manual evaluation for interpretation, which requires an understanding of mass spectra.

Requisites to digest the contents of the book include a background in basic chemistry and the structure and reactivity of organic compounds. Previous exposure to mass spectrometers and/or mass spectral data would be useful, but should not be necessary. This book would do well to serve as a basis for an upper level undergraduate or graduate course, and it is organized and sufficiently stocked with explanations, examples, and problems to be used by motivated self-learners. The sheer volume of detail, however, would likely overwhelm students in a typical one- or two-day short course setting. References appropriate to content are provided at the end of each chapter and add value to the already detailed discussions. In addition to being an excellent candidate for a classroom textbook, this book should also serve well as a desk reference for anyone practicing the art of interpreting mass spectra.

Most of the information contained in the book is easily accessible via the table of contents and general index. The first chapter provides an overview of how mass spectra are generated and then searched against databases. Also discussed are various criteria used in determining the validity of the mass spectra. The following seven chapters logically present, and re-enforce through examples and problems, many of the concepts necessary in order to approach manual interpretation of mass spectra. The final chapter begins with the refreshingly honest statement "The mass spectra of complex molecules usually defy complete interpretation", and then cautiously delves into the arduous task of interpreting some real-world examples.

The potential reader should be forewarned that the book deals with electron ionization (EI) mass spectra of small organic molecules. EI is a mature technique that is irreplaceable in a wide range of applications. The subject itself may seem somewhat ordinary, considering the current fashion of examining large biomolecules by the popular electrospray (ES) and matrix-assisted laser desorption (MALD) ionization methods. However, as new fields of research emerge, such as metabolomics, new applications of EI of small organic molecules will be developed. Also, starting small is the perfect place to begin an understanding of mass spectra.

Lawrence R. Phillips

National Cancer Institute
Frederick, Maryland

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