

Book Reviews*

The Chemistry and Biology of Winemaking. By Ian Hornsey (Northgate Brewery). Royal Society of Chemistry, Cambridge. 2007. xii + 458 pp. 6 × 9 in. £29.95 ISBN 9780854042661.

Readers of this journal who appreciate a glass of good wine will probably share this referee's view that wine is one of the great natural products contributions to the health and happiness of mankind. This book covers, in 10 chapters and two brief appendices, the history of wine; details of the origin, taxonomy, and distribution of the *Vitis* spp.; fermentation and the yeasts involved; the winemaking process, including malolactic fermentation; clarification, stabilization, and preservation; maturation and aging; fortified wines; and other organisms important in oenology, including pests and diseases.

The book is well written and incredibly informative; with but a few dry spots and redundancies, it provides, in sweeping detail, a clear picture of the numerous factors and processes critical to winemaking, along with the challenges faced by winemakers in dealing with those issues. For those who want to understand the terminology of wine and winemaking, this book will deliver. For those who want to know more about winemaking or who may be considering winemaking as a hobby or career alternative, this book will be a valuable guide for the challenges ahead. In the end, this book celebrates a natural process observed long ago, now evolved into a bioengineering system, but still dependent on the skill, intuition, and artistry of the winemaker.

NP800517E

10.1021/np800517e

An Introduction to Molecular Biotechnology. Edited by Michael Wink (University of Heidelberg). Wiley-VCH, Weinheim. 2006. lvi + 768 pp. 17 × 24 cm. \$100.00. ISBN 3-527-31412-1 (soft).

This text brings together an extraordinarily diverse set of topics contributed by 40 authors. Technically, the book is of the highest quality, clearly printed, and quite durable. The book is organized into four main parts, comprised of 39 chapters, a large 43-page glossary, and a 45-page index. Additional supportive information found in the beginning includes an almost 9-page list of abbreviations and 18 pages of colored figures, whose black and white equivalents are integrated into their respective chapters.

Each chapter begins with a brief set of objectives, which, while not true learning objectives, do act as a brief abstract. For a reader to best profit from the text, one must have a thorough understanding of organic chemistry and some introduction to analytical and basic biochemistry. This is not a biochemistry text, and it does not come with a disk of the figures, which would have been useful.

Part I, "Fundamentals of Cellular Macromolecules", contains six chapters all written by Editor Wink. A 4-page description of the cell as the basic life unit is followed by four chapters (114 pp) on cell structure, function, and macromolecules. It concludes with a 5-page chapter on the "Diversity of Organisms". This final chapter also contains a very brief list of references for Part I, 26 of the 36 of which are other Wiley-VCH texts.

Part II, "Standard Methods in Molecular Biotechnology", contains 14 chapters (140 pp). It is quite good, with nice overviews of cloning procedures and DNA/RNA isolation methods. This reviewer felt that the chapters on PCR and DNA sequencing were overly brief, even though for most laboratories these techniques

are fully automated. References here, as throughout the rest of text, are found at the ends of the chapters; they are sparse but current through 2003/2004, with occasional citations to 2005.

Part III, "Key Topics", encompasses 13 chapters (339 pp). Genomics and functional genomics lead, followed by protein–protein and protein–DNA interactions. There is a commendable overview of bioinformatics, but incomplete coverage of drug research, drug targeting, and prodrugs/molecular diagnostics. The chapter on gene therapy is a nice overview, as is the chapter on biocatalysis. However, chapters on antisense and plant biotechnology are weak. There is virtually no discussion of SiRNA or nanotechnology's impact on drug delivery/biotechnology.

Part IV, the final section, "Biotechnology in Industry", consists of 6 chapters (73 pp). All are frustratingly brief, as exemplified by the topics the environment, industry's status quo, and a global view of the industry, all appearing on the same page! A scan of the industry's emergence, its marketing, and "101 of founding a biotech company" make up 3 chapters (29 pp).

This is not a text to use as the foundation for a comprehensive course in molecular biotechnology. Its length and cost question its use as an introductory course text. It may prove to be a good reference that university or departmental libraries would want to own for advanced undergraduate/graduate use. It is a tour de force of hundreds of topics for which the authors are to be commended, but like its kaleidoscopic approach, it leaves one somewhat puzzled when trying to interpret the final result.

Robert J. Krueger

Ferris State University
Big Rapids, Michigan

NP800519C

10.1021/np800519c

Studies in Natural Products Chemistry, Vol 30, Bioactive Natural Products (Part K). Edited by Atta-ur-Rahman (University of Karachi). Elsevier Science, Amsterdam. 2005. xiv + 963 pp. 17 × 24.5 cm. \$506.00. ISBN 0-3444-518-54-1.

Volume 30 of this series continues the tradition of a broad review of current topics in the field. This book is comprised of 20 chapters, all written by leading international experts in various fields of natural product chemistry. The chapters are well written and cover a depth of topics in natural products research. Included are discussions of synthetic routes to discodermolide and pironetin (Cossy and Bouzbouz); antitumor and vascular effects of natural products (Kimura); antiobesity effects of natural products (Han, Kimura, and Okuda); bioactive phenolic lipids (Kozubek and Tyman); natural products as a source for new analgesic drugs (Yunes, Filho, Ferreira, and Calixto); biological active polyphenols from acid treatment of arylpropanoid and aryloethanoid derivatives (Cotelle); bioactivity of labiate flavonoids (Ulubelen, Topcu, and Kolak); biological activity of quinones (Martinez and Benito); serotonin and the etiology of autism (Ruiz-Rubio and McInnes); antiviral activities of polysaccharides from natural sources (Martinez, Del Olmo, and Benito); recent advances in the chemistry of bioactive 3-deoxy-ulosonic acids (Banaszek and Mlynarski); structure–activity relationships of naturally occurring active forms of vitamin D analogues (Tachibana and Tsuji); charged carotenoid species (Liaaen-Jensen and Lutnaes); bioactive constituents of the genus *Hernandia* (Gu and Kinghorn); a survey of bioactive secondary metabolites from the genus *Hypericum* (Avato); bioactive

*Unsigned book reviews are by the Book Review Editor.

triterpenes and related compounds for Celestraceae (Alvarenga and Ferro); biologically active substances from the genus *Baccharis* (Martinez, Bessa, and Benito); host defensive and pharmacological study of *Chlorella vulgaris* strain CK (Hasegawa, Kumamoto, Nomoto, and Yoshikai); pharmacological activity of new μ , δ , and κ receptor agonists and antagonists (Capasso and D'ursi); and clinical applications of earthworm fibrinolytic enzyme (Zhao, Qi, Wu, Li, and He).

The wide range of topics covered in this volume from structure elucidation to synthesis and biology will be appealing to a diverse audience. Overall, the volume is well written and contains very few errors. The chemical structures are well presented, and the subject index is comprehensive. Diagrams and figures are clear. Some formatting differences can be noted between the various chapters. This book is a valuable source of information for research scientists and scholars working in the field of natural product chemistry and medicinal chemistry. It is a good reference book and should be on the shelves of most chemical libraries. Regrettably, the price of this volume will put it beyond the budget of most individual scientists.

Jimmy Orjala

*University of Illinois at Chicago
Chicago, Illinois*

NP800521P

10.1021/np800521p

Applied Thin-Layer Chromatography—Best Practice and Avoidance of Mistakes. 2nd ed. By E. Hahn-Deinstrop. Translated by R. G. Leach. Wiley-VCH, Weinheim. 2007. xvi + 330 pp. 16.5 × 24.5 cm. \$190.00 or £100.00. ISBN 978-3-527-31553-6 (hard-cover). ISBN 978-3-527-61025-9 (e-book).

The art of thin-layer chromatography (TLC), as introduced in the mid-1950s by Egon Stahl, has proven its use not only in pharmacognosy or phytochemistry but also in almost all experimental pharmaceutical sciences, as well as in food, chemical, and environmental quantitative, qualitative, and bioactivity analyses. Economical, fast, powerful, and easy, this underestimated chromatographic technique has developed over the years many useful features also favored and employed in teaching, research, and industry. All these aspects are smartly covered in the second edition of *Applied Thin-Layer Chromatography—Best Practice and Avoidance of Mistakes*, which has been revised, enlarged, and improved from the first edition translated from German to English.

The well-organized book contains 12 chapters and more than 150 subheadings, including an appendix as the final chapter, where amazing art applications of TLC, such as CHROMart, are described. Annexed listings containing more than 200 updated references, abbreviations, and a market overview are the other subheadings in this last chapter. The introductory chapter contains new and revised guidance on the current world TLC literature. In addition, this second edition contains a completely revised Chapter 8 on documentation, including the current use of digital cameras. Selected new sorbents, instruments, and methods, such as diode array detection or bioluminescence, are also introduced in relevant chapters. Compliance with standards and GLP/GMP regulations is described in detail, including the required documentation and illustrations. The subject index, containing more than 500 entries, is satisfactory, but could be improved.

The book contains 27 very useful, educational, well-organized, and colorful tables, more than 100 figures, 122 illustrative cartoons and documents, and more than 100 color photographs, mainly on TLC separations. Practical, indeed, and complementary to the title (*Best Practice and Avoidance of Mistakes*) information boxes, tips, directions, hints for trouble-shooting, examples, and applications

are very supportive for users from undergraduate up to the professional level. Such features distinguish this particular book from other TLC application books, which are actually very few in number.

From the pharmacognosy, phytochemistry, and natural products point of view, in general, natural product separations are known to be quite challenging, both qualitatively and quantitatively. However, preparative isolation of and analytical approaches to the broad array of natural product classes are rather limited in this book.

This book should be of interest, if not “a must”, to professionals frequently using analytical/preparative chromatographic techniques. Pharmaceutical, food, and chemical investigators in routine and research analysis would certainly benefit from the practical and illustrative information contained herein. Although the book may be rather sophisticated and expensive for undergraduates, it is a useful handbook for professionals. However, the book is also available in electronic form from the publisher, perhaps expanding its accessibility.

Fatih Demirci

*Anadolu University
Eskisehir, Turkey*

NP800516P

10.1021/np800516p

The Emergence of Life—From Chemical Origins to Synthetic Biology. By Pier Luigi Luisi (University of Rome). Cambridge University Press, 2006. xvi + 315 pp. 17 × 25 cm. \$64.00. ISBN 0-521-82117-7.

“Do you accept the idea that a rose is made up only by molecules and nothing else?” “Is an apple—hanging on a tree—living? When it falls to the ground, is it still living?” These are two of the many questions raised by the author in this book, as he develops models to explain how life arose on Earth. This book introduces concepts related to prebiotic chemistry and artificial biomolecular systems that have been designed to mimic biochemical reactions of a living cell. From the outset, readers are presented with challenging topics, such as “Conceptual Framework of Research on the Origin of Life on Earth” and “Approaches to the Definitions of Life”. Starting from a historical perspective, the book moves very quickly to the current concepts and scientific achievements that provide explanations of how life may have arisen (“one or many startings?”). Luisi’s handling of such tricky questions is both conceptual and based on impressive and extensive experimental work, thoroughly referenced, developed by his group and by many other groups all around the world. Luisi emphasizes the importance of defining terms in order to explain his and other arguments, such as contingency, self-organization, emergence, self-replication, self-reproduction, and autopoiesis. In the early part of the book, the reader is placed in a somewhat uncomfortable position, since the author leaves many questions unanswered. Perhaps a third to halfway through the book, a picture starts to form and to become more clear, but several questions still remain unanswered. By the end, many questions have not been answered at all; however, the author’s purposes and proposals can be beautifully understood.

Undoubtedly, Luisi’s *tour de force* is a significant achievement. The text is easy to read and the pictures, diagrams, and graphs make it easier to grasp the ideas behind the incredible amount of experimental data collected since Miller’s and Oparin’s first experiments on prebiotic chemistry. The reader must be aware that not only biochemical and organic chemistry experiments have been developed during the almost one century of investigations toward the understanding of life. Also, and perhaps more important, biophysical and physicochemical experiments provided amazing information on the behavior of lipid, micelle, vesicle, and liposome

systems, which, according to Luisi's arguments, seemed to be of seminal importance for the emergence of a first operational living cell. The book goes into a crescendo and ends up supporting "Approaches to the Minimal Cell" proposals in the last chapter.

It is not a book to read without some curiosity about the fundamental questions of life. At the end of each chapter the author presents three to four questions, most of them difficult to answer. Actually, in the opinion of this reviewer, the book has many more questions than answers, but could it be otherwise on such a subject? I really do recommend the book for those who like to think about interesting questions concerning life, evolution, prebiotic chemistry, determinism, biochemical models, and many other questions related to the current philosophical, ethical, social, and ecological problems of mankind's activity on Earth.

Roberto G. S. Berlinck

*Universidade de São Paulo
São Carlos, SP, Brazil*

NP800506R

10.1021/np800506r

Organic Synthesis with Enzymes in Non-Aqueous Media. Edited by G. Carrea and S. Riva (Istituto di Chimica di Riconoscimento Molecolare, Milano, Italy). Wiley-VCH, Weinheim. 2008. xvii + 310 pp. 7 × 9¹/₂ in. \$215.00. ISBN 978-3-527-31846-9.

The book explores recent advances in the use of alternative media to conduct organic synthesis with the catalytic help of enzymes. The text is directed toward professionals working on industrial scale biotransformations; therefore, the examples presented are mostly reactions either currently used or suitable to employment on a preparative scale. This well-written book is organized into three parts: Biocatalysis in Neat Organic Solvents—Fundamentals (Chapters 1–3); Biocatalysis in Neat Organic Solvents—Synthetic Applications (Chapters 4–7); and Biocatalysis in Biphasic and New Reaction Media (Chapters 8–12).

The first part of the book analyzes the biophysics involved in biocatalytic reactions in nonaqueous media. This information could be useful for the synthetic organic chemist looking for nontraditional synthetic methodologies, although it is essential when industrial processes need to be improved. In particular, Chapter 3, which discusses the different options to activate and protect enzymes without water as the bulk solvent, is a very handy compilation of resources to increase the potential of the biocatalysis independent of the process scale.

The following two chapters contain successful examples illustrating why enzymatic catalysis is alternatively chosen over the use of traditional chemical catalysis: highly enantioselective reactions (fourth chapter) and dynamic kinetic resolutions of mixtures (fifth chapter). As a result of the relative youth of this area, only a few aspects of the mechanism of these types of reactions are known (and not presented in this text), but some empirical rules are shown in the second part of this book.

The considerable potential for exploiting the chemoselectivity and regioselectivity of nonaqueous enzymology is presented in Chapter 6. These two topics are fascinating, but the text covers only transformations involving peptides, polyols, sugars, and natural glycosides as substrates, probably due to the likely industrial

application in the development of new material in these areas. Following the main focus of this book, Chapter 7 outlines those successful nonaqueous biocatalytic processes that made their way to the industry.

Alternative transformation media are presented in the final five chapters. This extensive section includes not only the most classic biphasic system, organic solvent–aqueous phase, but also some very imaginative reaction conditions, including buffer/ionic liquid and solid/gas.

In summary, the book possesses a good compilation of examples of organic synthesis in nonaqueous media that could be used by professionals in the field looking to improve yields of problematic biotransformations. Further, this is an interesting complementary textbook to bring into play in a bioorganic chemistry class, covering this fascinating, growing, but still not thoroughly explored subject.

Tamara L. Meragelman

*National Cancer Institute
Frederick, Maryland*

NP800520S

10.1021/np800520s

Meaningful Scents around the World. By Roman Kaiser (Givaudan Schweiz AG). Verlag Helvetica Chimica Acta, Zürich. 2006. vi + 3004 pp. 21 × 23.5 cm. €98.00. ISBN 978-3-906390-37-6.

This book is both an overview of the state of the art in the science and technology of the natural fragrance industry and also a delightful, if not breathtaking, glance at some of the rare or endangered fragrant plants from around the world. The author has skillfully and elegantly crafted a book that will engage both scientists and laymen. The pictures and habitat descriptions will capture the attention of any reader, while the scientific data illustrate so clearly how the analytical technology now at our disposal permits a quite thorough, but nondestructive sampling and analysis of plant volatiles in the wild.

There are only three chapters in the book. Chapter 1 is an introduction to the biological meaning of and historical facts about botanical scents; following this is a brief description of the field techniques used by the author to collect and study botanical scents. Chapter 2 is the main course of the book, consisting of 23 short vignettes describing unique plant species from around the world, the area where each grows, and what the author and his team found in their analyses. Sampling sites are widely distributed around the world and include South America, Europe, Africa, Asia, and the Indo-Pacific. Chapter 3 provides the technical details and the analytical data from each analysis (the compounds identified and their relative percentages); an incredible amount of data is summarized in this chapter.

The book is laced with beautiful color photographs; the chemical structure renderings and chromatograms are clear and consistent; and the text is easy to digest, but rich with detail. This is an excellent book for any number of interest groups: natural products chemists, botanists, conservationists, and anyone who would like an introduction to the fragrance industry and its underlying research.

NP800518X

10.1021/np800518x