

Book Reviews

Classics in Total Synthesis II. By K. C. Nicolau and S. A. Synder (Scripps Research Institute). Wiley-VCH, Weinheim. 2003. xix + 639 pp. 7¹/₂ × 11 in. \$64.95. (soft). ISBN 3-527-30684-6.

This is the second volume of *Classics in Total Synthesis* started in 1996. The first volume was written to advance chemical synthesis to new heights and to train the next generation of synthetic organic chemists. Given that the field of total synthesis of natural products has continued to flourish, the authors have compiled over 30 total syntheses accomplished since 1992. Among the syntheses covered are swinholide A, dynemicin A, ecteinascidin 743, resiniferatoxin, epithilones A and B, manzamine A, vancomycin, colombiasin A, quinine, vinblastine, diazomamide A, and plicamine. The book also covers domino reactions, cascade reactions, biomimetic strategies, and asymmetric catalysis. In addition, the topics of solid phase synthesis, combinatorial methods, and solid-supported reagents are also discussed.

Overall, this is an excellent teaching text for graduate courses in synthetic organic chemistry. This volume is set up more clearly for teaching than Volume 1. A nice addition to this volume is the discussion of more than one synthetic approach to the featured target. The book also uses text boxes to highlight key concepts and important reactions discussed. Furthermore, the book has excellent discussions of the mechanisms or proposed mechanisms of action of the target molecules. A minor weakness of the book is the brevity given to the efforts needed to isolate, characterize, and evaluate the natural products selected. An exception is the in-depth discussion of the structure elucidation of diazomamide A. Regardless, this book is a welcome addition to the library of organic chemists, young or old.

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Forensic Botany. Principles and Applications to Criminal Casework. Edited by H. M. Coyle (Department of Public Safety, Meriden, CT). CRC Press, Boca Raton, FL. 2005. xviii + 318 pp. 16 × 24 cm. \$119.95. ISBN 0-8493-1529-8.

The foreword (B. Budowle) to this text declares, "Therefore, a primer book was needed to familiarize the forensic scientist about the plant world." An admirable goal, but, unfortunately, this text is plagued by poor organization, numerous errors, old information, indiscernible figures, and numerous "case" examples that are neither cases nor examples that support the text. The chapters should be reordered to present basic information on DNA and other new biotechnological advances to the reader first, before he/she encounters them in the heart of the book. Other chapter sections and parts that do not support the topic as titled should have been eliminated, i.e., 13.6.2 (Cat Hair Evidence), 13.6.3 and 13.7 (Dog Evidence), 6.4 (Tracing the History of the Potato), 6.5 (The Origin of Rice), 6.6 (Evolution of Corn), and 2.9 (the Great Hedge of India). The plant binomials in the tables in Chapter 6 need to be completely spelled out in order to be useful to the reader. *Ledum* spp. owe their toxicity to the presence of andromedatoxin analogues, not resins (2.7), and Figures 15.1A and 1B are photographs of lichens, not mosses as identified.

As to "old" information, Chapter 11 is a reprint of an article published in 2001, and many chapters list no references or none more recent than the late 1990s–2001 (2, 5, 10.2, and 14). In Chapter 5, the section "History of DNA—Timeline (5.12)" stops at 1999, neglecting recent work in plants such as rice. Most of the figures reproduced from photographs are too dark to be discernible (1.1, 1.2, 4.1, 6.3, 9.2, etc.). The line drawings in the introductory chapters on botany are oversimplified and scientifically inaccurate as a result (2.4, 3.1, 3.2, and 3.3). The placement of excellent figures supporting the text in Chapters 5 (5.2, 5.3) and 10 (10.3, 10.4, 10.6) as a cluster into the text of Chapter 14 may be convenient to the publisher, but not to the reader.

Some excellent chapters are included in the text, namely, 14 on Forensic Palynology (Milne et al.); 11.2, re The Hoeplinger Case (E. Pagliaro); and Appendix A, Considerations for the Use of Forensic Botanical Evidence: an overview. Unfortunately, these high points do not offset the plethora of shortcomings, making it difficult to recommend this text to anyone.

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Phytopharmaceuticals in Cancer Chemoprevention. Edited by D. Bagchi (Creighton University) and H. G. Preuss (Georgetown University). CRC Press, Boca Raton. 2005. xvi + 665 pp. 18 × 26 cm. \$139.95. ISBN 0-8493-1560-3.

The association between cancer incidence and dietary composition of geographically distinct populations led to the original hypothesis that phytochemicals derived from foodstuffs might be used to prevent cancer. This book represents an assembly of a remarkable cadre of international experts from specific areas of cancer causation and the phytochemistry of cancer chemoprevention. The strengths of this book are numerous, and most chapters address each topic with comprehensive authority.

The book is comprised of three general sections: a short section on cancer statistics and epidemiology and a larger section on the pathophysiology of various cancers that points to specific opportunities for cancer chemoprevention, followed by the largest section, which is devoted to the various, specific chemopreventive modalities and current state of science on each. Common to all chapters is an unusual but welcome level of detail on the history of each field or modality. For example, an outstanding discussion of the chemopreventive effects of curcumin that spans from its structural description in 1815 to clinical interventional trials ongoing today is offered by Dr. Bharat Aggarwal and colleagues. Probiotic bacteria, while not necessarily phytochemicals, are also discussed, starting with the observation over a century ago by the Nobel laureate Elie Metchnikoff of a high life expectancy in Bulgarian peasants who consumed large amounts of fermented dairy products. Together with historical perspective, there are discussions of timely conundrums as well, such as, "Why did β -carotene supplementation increase lung cancer risk in the ATBC and CARET studies?" and "Do dietary antioxidants really help prevent or treat cancer?". Mehta and Pezzuto discuss the methodological challenges in developing suitable surrogate markers in screening phytochemicals for chemopreventive outcomes.

Perhaps the only shortcoming of this otherwise superb reference text is that the chapters are uneven in addressing the physiological realities of achieving concentrations of phytochemicals in humans that would be consistent with cancer prevention. Granted, this concern is one for pharmacologists and clinicians, and some authors pay significant attention to this detail. However, the ultimate application of the chemistry of chemopreventive phytochemicals, as well as the future for chemoprevention research, will undoubtedly require that basic scientists begin to appreciate the barriers to bioavailability of phytochemicals.

During the preparation of this review, the significant loss of life in the wake of Hurricane Katrina on the U.S. Gulf Coast brought to mind what the fractional cost might have been to prevent many of the avoidable injuries and deaths relative to the costs incurred in the aftermath. Likewise, the measured application of the principles of cancer chemoprevention could do more to reduce pain and suffering due to cancer than any group of so-called targeted therapies.

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Making the Right Moves. A Practical Guide to Scientific Management for Postdocs and New Faculty. Developed by M. Franko (Howard Hughes Medical Institute) and M. Ionescu-Pioggia (Burroughs Wellcome Fund). Howard Hughes Medical Institute, Chevy Chase, MD, and Burroughs Wellcome Fund, Research Triangle Park, NC. 2004. xiv + 233 pp. 21 × 28 cm. No charge. ISBN: none.

Graduate students and postdocs focus on achieving research results and advancing science, with little or no training devoted to career development and management. This training gap adds to the difficulty of finding a faculty position and becoming a successful independent investigator. Now, a book is available that begins to fill that gap, answering many of the questions that plague those seeking a faculty position. The book is free and also available online at <http://www.hhmi.org/grants/office/graduate/labmanagement.html>.

Sixty-three contributors, including scientists, teaching specialists, administrators, and others, share their hard-earned wisdom in this volume, providing an understanding of how to obtain an academic position, and once there, how to be successful. It is impossible for any such book to exhaustively cover all topics or to be precisely tuned to all scientific disciplines, but it comes quite close to being complete, especially in the section on how to obtain a job. Probably the best strategy in using this book would be to read the appropriate chapter, then to ask advisors or mentors more specific questions.

The first section of the book provides details on the job search, negotiations, and what is expected on the path to tenure. For example, the book describes in detail successful application packages and common interview formats. The middle series of chapters covers lab management, especially focusing on how to find and mentor lab personnel. Many scientists do not fully consider the practical management aspects, such as how to set and achieve goals, and the book provides time-tested strategies. Final chapters concern more global research management issues, such as obtaining funding, intellectual property, publishing scientific manuscripts, and collaborating. While it is possible to obtain information on funding by asking many detailed questions and reading long grant guidelines published by federal agencies, readers of the funding chapter will learn the most important points within a few pages of text and simple diagrams.

Additional sections at the end of chapters provide links to specialized online resources. Since the chapters are short and pro-

vide a reasonable but cursory overview of their subjects, these links contain crucial additional information on important topics.

This book should also be useful for those unsure of whether they want to take the academic route, since it provides an accurate picture of what is expected of junior faculty members. The chapter on time management is particularly illustrative, in addition to being helpful for those already occupying faculty positions. Tips are given that will help faculty to maintain protected time for creative research—the reason many of us are in it to begin with.

This book is strongly recommended for anyone considering a faculty position or in the first few years on the job.

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Perspectives in Flavor & Fragrance Research. Edited by Philip Kraft (Givaudan Schweiz AG) and Karl A. D. Swift (Maybridge Ltd.). Verlag Helvetica Chimica Acta AG, Zurich, and GmbH & Co. KGaA, Weinheim. 2005. vi + 242 pp. 24 × 17 cm. \$170.00. ISBN 3-906390-36-5.

This compendium, written to document the proceedings of the “Flavor & Fragrance 2004” meeting held in Manchester U.K., covers a diverse collection of research within the world of fragrance and flavor. The text is broken down into four chapters addressing natural products chemistry, two relating to olfaction, three on foods and flavors, and nine covering various aspects of fragrance chemistry. An introduction to the molecular aspects of olfaction, written to lure even the most novice individuals, allows the reader to brush up on the complexities surrounding the science of smell. Further investigation of the text offers insight into a variety of subject matter ranging from “Scent Exploration” to the volatiles from breakdown of roasted spotted shrimp.

Fragrance chemistry was heavily represented in this text, with three chapters dedicated to musk: “brain aided” design and alicyclic and macrocyclic synthesis. Two chapters addressing chirality covered the synthesis of stereoisomers as well as a thought-provoking discussion on the impact of enantiomeric purity in biodiversity. Axillary sweat of Japanese males was examined in a chapter identifying two new compounds described as “spicy” and “sulfurous”. The organic chemists’ plight to fulfill the demands for new fragrance materials was acknowledged in a chapter written to highlight the development of aromatic nitrile compounds. The pursuit of “green” chemistry was a driver in the chapter outlining the various synthetic raw materials derived from longifolene and α -cedrene that deliver new environmentally friendly woody and ambery notes. The research on *Angelica archangelica* that led to the first published report of muscolide (14-methylpentadecano-15-lactone) from a natural source can be found within this text.

The text offers the synthetic chemist insight into usage of silylating reagents to create unique organosilicon molecules that deliver ozone-like and sandalwood character. A novel approach to the synthesis of the tricyclic framework of prezizaane sesquiterpenes is presented, exhibiting better control of the stereoselectivity issues previously encountered in past synthesis. For the biochemist, an interesting chapter on the use of computer-aided modeling and binding studies shared a new β -lactoglobulin–lactone binding position, as well as improvements around the understanding and ability to predict free energies of binding between lactones and β -lactoglobulin.

While studies around fragrance seemed to reign in this compendium, flavor research was represented with an assortment of themes, starting with a chapter on the volatile development of Linden honey

from the source flower through the bee-stomach to the finished good. Clery et al. expanded volatile research by identifying pyrazines and pyridines extracted from black pepper oil and vetiver oil. David Rowe reminds the reader of the power and “fun” of working with furans in a chapter that points out the desirable and potentially undesirable effects furans can have on flavors.

This book reflects but a small glimpse of the vast amount of research currently taking place in the flavor and fragrance world. Overall, the text was very strong in fragrance work, and the biochemical and organic chemistry papers were interesting and thought provoking. I would recommend this text to anyone who is

interested in reading a broad overview of the various types of research taking place in the fragrance and flavor fields; it contains both general and specific work, allowing readers to pick and choose, based on their interests and experience.

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