Design and Strategy in Organic Synthesis

Any chemist who engages in the synthesis of complex natural products has been asked at some point in their careers "Why did you decide to synthesize that particular molecule?" This new book *Design and Strategy in Organic Synthesis* by Stephen Hanessian and his students Simon Giroux and Bradley Merner affords a compelling and historical perspective on that question. In 18 instructive chapters, the authors explore natural product synthesis from various viewpoints, ranging from the inherent beauty and challenge of a molecule itself to the art of its preparation to applications in addressing critical questions in chemical biology. And, it does so with a deep sense of the era in which a given molecule was tackled, highlighting that as the field has evolved, so too have the answers to that core query.

Using a visually appealing two-color format in well-rendered schemes and clear text, the authors organize the reader's journey in synthesis largely through source of chiral materials, exploring with each subclass the methodological and strategic questions that have captured the imagination and creativity of the field as well as how asymmetric catalysis, cascade chemistry, and other modern developments have advanced the art of chiral molecule construction. Where several approaches to a given target have been presented, the authors are careful to describe the unique components of each in a style that is didactic and accessible to any graduate student or postdoctoral fellow, with mechanistic details provided judiciously to enhance understanding. Moreover, the authors have not elected to focus solely on recent accomplishments; classic works are provided as well with strong historical context for what was achieved at the time the work was executed. Indeed, the format of the text readily lends itself to instruction for advanced students, with given chapters easily constituting pre-made lectures ready to be served by a willing and able instructor. For the established practitioner looking for inspiration (whether in research or for a new example to teach in class), a well-composed index, based either on target structure, chiral starting material, or primary author, makes the book readily searched, yielding answers even faster than one might achieve with an internet search engine!

Supplementing this pedagogy are several opening chapters, and a concluding capstone synopsis (entitled "The Essence of Synthesis—A Retrospective") which serves not only to frame the main heart of the book, but also to afford a powerful vision and perspective on the field: its accomplishments, its goals, and most significantly, its future potential (which is bright).

To be sure, there are several books (and series of books) available on the topic of natural product synthesis. Nevertheless, this text is a welcome addition to that collection, one that offers many unique perspectives and connections to other areas of inquiry and the human experience that are likely to be of great value to any serious student of organic chemistry. Its organization affords a distinct way to catalog, consider, and explore synthetic efforts, and the play-by-play for the works described could not be clearer or more concise. It is highly recommended.

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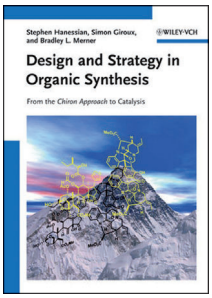
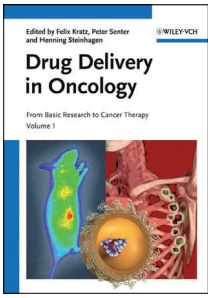


Design and Strategy in Organic Synthesis
From the Chiron Approach to Catalysis. By Stephen Hanessian, Simon Giroux and Bradley Merner. Wiley-VCH, Weinheim, 2013. 828 pp., hardcover, € 139.00.—ISBN 978-3527333912

Drug Delivery in Oncology

Modern oncology is a multidisciplinary field, with thousands of clinicians and researchers committing enormous efforts and resources to develop novel and/or improve existing therapies for cancer. However, current success in treating cancer is mostly due to early detection and better screening rather than improved treatment. Therefore, it is critical to understand why current therapies fail, how they can be improved and what best approaches should be taken to design safer and more effective therapies. The three-volume book *Drug Delivery in Oncology* under edition of Felix Kratz, Peter Senter, and Henning Steinhagen provides a state-of-the-art review of the field and represents a unique source of information to anyone who is interested in the topic. The book contains 49 chapters divided in three volumes, which are contributed by 121 internationally recognized experts. Each chapter is written by foremost experts in the respective fields, and comprehensively describes the basic scientific background, as well as preclinical and clinical research status, which makes the material clear and understandable to readers with diverse backgrounds.

Volume 1 covers general principles of tumor targeting (part I) and tumor imaging (part II). It starts with a historic overview of conventional



Drug Delivery in Oncology
From Basic Research to Cancer Therapy. 3 Volumes. Edited by Felix Kratz, Peter Senter and Henning Steinhagen. Wiley-VCH, Weinheim, 2011. 1690 pp., hardcover, € 449.00.—ISBN 978-3527328239

chemotherapy and its limitations, followed by chapters on pathophysiological and vascular characteristics of solid tumors in relation to drug delivery and enhanced permeability and retention effect. These chapters contain a lot of basic information supported by specific examples that is essential for successful design of anticancer drug delivery systems. Following chapters are more case-specific and describe the role of neonatal Fc receptor in drug design (chapter 4) and "Antibody-Directed Enzyme Prodrug Therapy (ADEPT)" (chapter 6). Finally, Part I also reviews the development of cancer targeting ligands (chapter 5) and ligand–drug conjugates. This chapter, however, is very brief and introductory to the subject and describes only several examples despite of extremely extensive research in this area. More examples and details are provided in specific sections in volumes 2 and 3.

The second part of volume 1 is attributed to various methods of tumor imaging (chapters 7–9). The field is actively growing and developing and it is extremely important for clinical applications (diagnosis and cancer detection, therapy efficacy monitoring), as well as in preclinical development of drug delivery systems. This part starts with general overview of imaging techniques, followed by a chapter on MRI contrast agents and tumor imaging using SPECT/CT and PET/CT, delivering a comprehensive overview of modern tumor imaging approaches.

Overall, volume I can be called "introductory" to the drug delivery field, but still contains a lot discussion on clinical applications of various drug delivery and imaging systems. It is an excellent resource for academic students and professionals, as well as practicing clinicians. This volume also summarizes basic tumor biology aspects that are critically important for successful design of new therapeutics and/or improvement of existing treatments.

Volume 2 contains 26 chapters on macromolecular drug delivery systems (part III, chapters 10–26) and nano- and microparticulate drug delivery systems (part IV, chapters 27–36). Part III begins with an impressive body of information on antibody-based systems for cancer therapy, targeting, and imaging. The area of utilizing antibodies for cancer has been developing in several directions, including therapeutic antibodies, targeting antibodies and antibody fragments. There are chapters devoted to each of these aspects with emphasis on specific examples. Second half of part III is dedicated to polymer-based systems, specifically to polymer–drug conjugates, and covers basic principles of design of polymer–drug conjugates, dendrimer-based systems, poly(ethylene glycol)–drug conjugates, etc. Of particular interest is the chapter 26 about clinical experience with drug–polymer conjugates. It provides deep analysis of polymer–drug conjugates that have entered clinical development in the past 15–20 years, and explains the reasons why most of them have failed. Part IV covers nano- and microparticulate drug delivery systems, from liposomes, immunoliposomes to polymer-based systems and albumin-drug nanoparticles and carbon nanotubes.

Altogether, volume 2 covers the state of the art of various drug delivery systems with historic overview and their current status. Any reader interested in drug delivery would find something useful for himself here. The presented information is strongly supported by numerous examples from both academic side as well as clinical side.

Finally, volume 3 focuses on ligand-based drug delivery systems (Part V, chapters 37–41) and special topics (part VI, chapters 42–49), including delivery of RNA, genes, proteins, and specific organ-targeting strategies.

Generally, each chapter in the book represents an independent and complete review of a specific topic. There is a considerable crosstalk between the chapters (including different volumes) that is not cross-referenced in the text. For instance, polymer-based drug delivery systems are discussed in volume 1 and in several chapters in volume 2, and those interested in polymer-based drug delivery systems will have to jump between different chapters. This however doesn't in any way diminish the value of the book, which provides an outstanding amount of information in a clear and precise way. This material is suitable for a broad readership with various backgrounds. We strongly recommend this book as an encyclopedia of drug delivery in oncology.

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