Book Reviews

Bioconjugate Techniques. Second Edition. By Greg T. Hermanson. Academic Press, San Diego, CA. 2008. xxx + 1202 pp. 19.0 × 23.5 cm. ISBN 978-0-12-370501-3. $99.95.

Phenomenal progress in recent chemistry collides with advanced biotechnology, creating novel, innovative bioconjugates of many types. Bioconjugate techniques indeed play a vital role right in this scenario and are proficiently summarized in this book. This book updates its previous edition with several modern bioconjugate techniques developed during the past decade and is organized into three parts. Part I deals with all fundamental chemistry of functional targets related to peptides, proteins, polysaccharides, and oligonucleotides, as well as reactive groups in established amino/hydroxyl reactions and photochemical and cycloaddition reactions, that frame the foundation of all conjugates. Part II includes reagents useful in the design and construction of bioconjugate entities, such as various cross-linkers, cleavable linkages, fluorescent probes, biotinyl chelating agents, dendrimers and dendrons, micro- and nanoparticles, nanotubes, chemoselective ligation, and distinct PEG reagents. Part III comprises several feasible bioconjugate applications that delivery systems rely on, such as immuno and immunotoxin conjugates, antibody conjugates, liposome and avidin−biotin systems, enzyme and nucleic acid/oligonucleotide modification, and synthetic polymer conjugate complexes. A protocol is included in each section to guide the reader on how to perform a specific reaction or to build a unique conjugate.

This second edition covers all reagents for chemical syntheses and more than 1800 references, constituting a comprehensive source for original designs of many varieties of bioconjugates. Extensive interactions between vital functional groups and biological molecules are exceptionally complicated but are well deciphered in Parts II and III and thereafter are capable of generating infinite novel entities to fulfill unmet therapeutic applications by assorted professionals. Well-schemed chemical reactions followed by protocols across all subjects are neat and intuitive, presenting two exceptional values for readers: generating inspiration and hands-on modus operandi. This book would definitely stimulate people who plan to or already pursue careers in medical, biosensor, pharmaceutics, bioengineering, diagnostics, biochemistry, and microbiological industries.

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Drug-like Properties: Concepts, Structure Design, and Methods. By Edward H. Kerns and Li Di. Academic Press, New York. 2008. xix + 526 pp. 19 × 26.5 cm. ISBN 978-0-1236-9520-8. $99.95.

There is little doubt of the important roles that chemistry and biology play in the development of novel medications. Modern drug discovery is dependent upon an ever growing arsenal of synthetic methodologies and novel molecular scaffolds from both synthetic libraries and natural product isolation. However, of the thousands of compounds a drug discovery project creates, only a fraction of these have the sufficient ADME/Tox (absorption, distribution, metabolism, elimination, and toxicity) properties to become a drug. This book is devoted to provide to drug research scientists and students an introduction to ADME/Tox property concepts, structure design, and methodology to arrive at an efficacious drug-like compound.

The book is divided into five broad parts, three appendices, and an index. Part 1 covers the advantages of drug-like properties and the barriers that a drug molecule encounters when entering living systems. Part 2 covers physicochemical properties including a discussion of Lipinski rules, lipophilicity, solubility, and permeability. The topics covered in part 3 are disposition, metabolism, and safety issues. In this section, the book discusses transporter fundamentals, including various efflux and uptake transporters; the blood−brain barrier; stability; plasma protein binding; and toxicity including inhibition of cytochrome P450s and hERG channels. Part 4 is devoted to methods for evaluating drug-like properties. Part 5 covers specific topics: improving pharmacokinetics, prodrugs, the effects of chemical and physical properties on biological assays, and formulation. In general, the authors do an excellent job of providing insight into the background of the many factors that influence drug-like properties. Key components of the book likely to be of utility to medicinal chemists are the many discussions of structural modification strategies to enhance drug-like properties. These cover such topics as pK_a, solubility, plasma protein binding, metabolic stability, and brain penetration. Pharmaceutical scientists will find part 4 an especially useful resource for methods to profile drug-like properties.

This easy-to-read text is suitable for use in a graduate course in the pharmaceutical sciences. The beginning of each chapter provides a brief overview and, at the end, includes problems and key references. In addition, the book contains appendices with the answers to the problems and a glossary. Overall, this work would be an excellent addition to the library of practicing medicinal chemists and of graduate students in the pharmaceutical sciences. It provides a wealth of information for a reasonable price.

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