Book Reviews

Complex Carbohydrates in Drug Research. Structural and Functional Aspects. Alfred Benzon Symposium 36. Edited by Klaus Bock and Henrik Clausen. Munksgaard, Copenhagen, Denmark. 1994. 454 pp. 16 × 24 cm. DKK 400.00.

By the end of this century, research on complex carbohydrates will emerge as a significant new approach to drug discovery; however, the current impact of this class of biomolecules in drug research is less than optimal. Complex carbohydrates are only found in localized areas of animal tissue, and the localization and functional characterization of these molecules are difficult. Structural analyses require not only the determination of the component monosaccharides and their sequence but the identification of the anomeric configuration, the linkage position, and any additional substituents. There is a lack of synthetic methods for controlling the anomeric stereochemistry and the multifunctional nature of these compounds. There are no existing automated solid phase technologies like those employed in peptide or nucleoside syntheses, and current enzymatic techniques are of limited pharmaceutical value. Probably most grave is the observation that complex carbohydrates are generally "weak binders" and have poor bioavailability profiles.

Nevertheless, research on complex carbohydrates is undergoing considerable growth. The book *Complex Carbohydrates in Drug Research*, which is a compilation of contributions and edited discussions of the participants at the Alfred Benzon Symposium held June 6–10, 1993, is an excellent review of the "state of the art" of complex carbohydrate research. Many of the obstacles mentioned in the preceding paragraph are examined on a theoretical basis. This volume starts with a chapter on oligosaccharide molecular dynamics calculations and ends with a chapter on the role carbohydrates may play in HIV antiviral intervention. I especially enjoyed the chapter by David Bundle because his work on carbohydrate–protein receptor binding has significant implications for agonist/antagonist design and the chapter by Ole Hindsgaul, despite the title, because his insights into glycosyltransferase reaction have potential for the discovery of inhibitors.

Other chapters of note for the medicinal chemists include glycosidase inhibitors by Andrea Vasella and analogs of anti-thrombin III glycosaminoglycans by C. A. A. van Boeckel. A word of caution for the medicinal chemists, however, is advisable. If looking for a book that delineates near term drug discovery targets, this volume will be a disappointment. Many of the chapter authors do not connect their research to specific therapeutic targets, and there are few examples of drug development candidates. Nevertheless, I recommend this book for those interested in reviewing the intermediate and long-term potential of carbohydate-based therapeutics or are interested in complex carbohydrates as a source of novel drug discovery leads.

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JM9407421

Topics in Stereochemistry. Volume 21. Edited by E. L. Eliel and S. H. Wilen. John Wiley & Sons, Inc., New York. 1994. xii + 533 pp. 16 × 23 cm. ISBN 0-471-52120-5. $135.00.

The current volume continues to provide the working chemist with thorough reviews on important topics in the area of stereochemistry.

The first chapter, by E. Vedejs and E. J. Peterson, covers the mechanistic and stereochemical aspects of the Wittig reaction. The Wittig reaction has been previously reviewed in Volume 5 of this series. In the past decade or so, extensive work on the mechanism of the Wittig reaction has been conducted, and yet controversy over the exact details still exist. In this chapter, an extensive tabulation of Wittig reactions should prove useful to the synthetic practitioner.

The second chapter, by P. P. Graczyk and M. Mikolajczyk, provides the reader with an extensive review on the aromatic effect including its theoretical and applied aspects.

The third chapter, by H. Dodziuk, is concerned with unusual saturated hydrocarbons. This chapter offers an overview of theoretical approaches to highly strained molecules, both real and hypothetical.

The fourth chapter, by D. W. Young, deals with the stereochemical course of enzymatic reactions of α–amino acids. Many of these enzymatic transformations involve reactions at prochiral centers, usually enantiotopic hydrogen atoms. Again an earlier part of this series, Volume 4, dealt with this subject in a general sense.

Chapter five, by M. G. Bures, Y. C. Martin, and P. Willett, deals with a recent topic of interest: the searching of databases of chemical structures in three dimensions.

References are numerous, through 1993, and are located at the end of each chapter. A Cumulative Title Index for volumes 1–21 and a Subject Index are included.

This excellent series is highly recommended to all chemists and is a requisite for all chemistry libraries.

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JM940743T