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Synthetic Oligosaccharides. Indispensable Probes for the Life Sciences. ACS Symposium Series 560

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BOOK REVIEW

Synthetic Oligosaccharides. Indispensable Probes for the Life Sciences. ACS Symposium Series 560. Edited by P. Kováč (National Institutes of Health), American Chemical Society: Washington, D.C. 1994, viii+306 pp. \$ 79.95. ISBN 0-8412-2930-9.

This volume, developed from a symposium sponsored by the Division of Carbohydrate Chemistry at the Southeast Regional Meeting of the American Chemical Society in Johnson City, Tennessee, October 17-20, 1993, is a concise compilation of new developments in the field of oligosaccharides. The editor is to be congratulated for drawing together these new developments in a comprehensive way. The book is divided into two sections. The first section comprises a compilation of five introductory chapters in the form of review articles. The first review, by Lee deals with synthetic oligosaccharides in glycobiology. It is a rather quick overview of different aspects of synthetic and enzymatic approaches dealing with anomeric specificity, positional isomerism, as well as compatibility of protecting groups. The second review, written by Petitou briefly describes some carbohydrate based drugs. The third review, by Backinowsky, provides a deep study of applications of cyanoethylidene derivatives in the synthesis of oligosaccharides and regular polysaccharides. A similar application of stannyl ethers and stannylene acetals in oligosaccharides synthesis is a subject of review by Grindley. The last, rather short review, article in this section was written by Lerner and deals with the important problem of flexibility of biomolecules and its implications for oligosaccharides by determining their molecular conformations in solution through various NMR techniques.

The second section of the book is concerned primarily with strategies for the synthesis of oligosaccharides as tools in the life sciences and consists of eleven chapters. The first chapter, by Petitou, reviews synthetic oligosaccharides as probes for investigating the binding of heparin to Antithrombin III. Conclusive evidence indicates that unique pentasaccharide sequence of glycosaminoglycan heparin is responsible for activating and binding of Antithrombin III. The second chapter, by Roy, et al., provide an interesting review on the synthesis and antigenic properties of sialic acid dendrimers as inhibitors of influenza virus hemagglutinins. The third chapter actually looks more of a research paper than a review. Matta, et al., describe total synthesis of some trisaccharides as acceptors for α -L-fucosyltransferases. Table 1 with ^{13}C NMR data of synthesized compounds is entitled Proposed Assignments. Chemical shifts should be always measured not proposed. The contribution by Chernyak reviews synthetic studies toward oligosaccharide-polyacrylamide conjugates of immunological interest. Oligosaccharide-polyacrylamide conjugates of synthetic fragments of *Salmonella* and *Proteus* O-antigens and capsular polysaccharides of *Streptococcus pneumoniae* and *Escherichia coli* are discussed.

The chapter by Glaudemans, et al., is an excellent review of approaches to study antibody-antigen interaction. Application of these approaches to study the binding of synthetic oligosaccharide ligands to two monoclonal antidextran antibodies is discussed. The chapter by Hasegawa deals with the synthesis of sialo-oligosaccharides and their ceramide derivatives as tools for elucidation of biological functions of gangliosides. An interesting contribution by Lehmann et al., provides a deep study of photolabile spacer-modified oligosaccharides for regioselective modification and probing of receptor binding sites. Ganglioside lactams, as analogues of ganglioside lactones, is a subject of a chapter by Magnusson, et al.

Stereoselective approaches to O-glycopeptide synthesis is a subject of Ogawa's chapter dealing specifically with the synthesis of sialyl glycosides and glycopeptides. The chapter by Nifantiev, et.al. deals with one of the most important topics currently: new synthetic ligands as probes for the study of adhesion molecules from the selectin family. The final chapter, written by Schmidt, is an excellent review on chemical synthesis of sialylated glycoconjugates and serves as a fundamental introduction to the chemistry of this fascinating group of carbohydrates.

The book concludes with an author index, affiliation index, as well as a subject index. All of the chapters were submitted in a camera-ready format, so the lay-out of the text, the quality of the chemical drawings, and the notation of references, etc. is different throughout the book. In spite of only these minor shortcomings, this book will provide a highly valuable and essential addition to any institutional, as well as personal library of every scientist engaged in research on the chemistry and biochemistry of carbohydrates.

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