

Book Review

Modern methods in carbohydrate synthesis, Edited By Shaheer H. Khan and Roger A. O'Neill, March 1996, Harwood Academy, Cloth 3-7186-5785-6. £102, \$170

During the last two decades, complex oligosaccharide synthesis has captured the 'limelight' of bioorganic chemistry. This appreciation is mainly due to the realisation that saccharides are involved in many crucial biological processes. As a result, several books have recently been published that deal with the chemistry and biology of saccharides and glycoconjugates.

The book, edited by Khan and O'Neill, is part of a series on natural product chemistry and is aimed at presenting a broad survey on the state of the art of synthetic carbohydrate chemistry with a particular emphasis on the chemistry of glycosidic bonds pertaining to both natural and unnatural analogues. The editors have recruited a formidable group of leading carbohydrate chemists to contribute to a total of twenty-one chapters.

The book begins with a historical overview by one of the leading pioneers of modern carbohydrate chemistry, Professor Hans Paulsen, and covers the most commonly applied methods for stereoselective glycosylation. This chapter is particularly useful for new-comers in this field of carbohydrate chemistry. The next eight chapters detail modern methods for glycosylation and their applications in oligosaccharide assembly. Most of these chapters are written by the scientist who developed a particular methodology. On the one hand this provides a detailed and personal account of each method but on the other hand does not result in providing critical overviews. It also does not advance the notion that many problems are associated with glycosylation and that many methods need to be considered to achieve the most efficient preparation of a particular oligosaccharide. However,

it offers many details that may be useful for those entering the fascinating field of glycosidic bond chemistry. Chapter ten deals with protecting group chemistry and highlights the most commonly employed protecting groups in saccharide chemistry but also includes some recently developed protecting groups that have unique selectivities. Chapter eleven presents a useful account of the methods available to prepare β -mannoside-containing oligosaccharides. The next two chapters are devoted to the synthesis of sialoglycoconjugates. Rather than giving an overview of this subject, the methods developed by the authors are covered. However, these approaches have been widely adopted by other groups and hence represent reliable recourse material. The next four chapters give reasonably comprehensive and critical overviews of the synthesis of C-glycosides, glycopeptide synthesis, the synthesis of neoglyconjugates and the preparation of sulphated and phosphorylated oligosaccharides. The final three chapters are exciting and cover the use of glycosidases and glycosyl transferases for glycosidic bond synthesis. Also the report on the use of glycosyltransferases for the synthesis of unnatural oligosaccharide analogues is very useful.

In conclusion, this book contains a high-quality collection of reviews covering many aspects of complex oligosaccharide synthesis. Some of the chapters give a personal account of the author's own research; others provide critical overviews. No doubt the book will be indispensable to those that have some experience of carbohydrate chemistry. However, many chapters are rather biased and it may be difficult for the novice to appreciate the problems of oligosaccharide chemistry.

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