



## Book Review

### Glycoscience—chemistry and chemical biology I–III

B. Fraser-Reid, K. Tatsuta, J. Thiem (Eds.); Springer-Verlag GmbH, Heidelberg, 2001, xix + 2854 pp, ISBN 3-540-67765-8 (£490.00)

The significance of glycoscience, which covers all aspects of the chemistry and chemical biology of carbohydrates and glycoconjugates, has grown dramatically in recent years out of the increasing need to interpret and understand complex natural processes at the molecular level. Glycostructures play a highly diverse and often critical role in a myriad of organisms and important systems in biology, physiology, medicine, bioengineering and technology. Only in recent years have the tools been developed to partly understand the highly complex functions and the chemistry behind them, but many facts still remain undiscovered.

The editors have drawn together in this three volume set (not available separately) the complete and up-to-date information on glycostructures, their chemistry and chemical biology, and present them in the form of a comprehensive and systematic survey, which is far beyond a collection of specialised reviews. The first volume provides detailed insight into the current status of structure analysis, synthesis and mechanistic interpretation. The opening section covers general principles, and includes information on the structure, properties, separation, purification and general occurrence of carbohydrates. This is followed by two comprehensive sections, that detail reactions at non-anomeric positions, and reactions at the anomeric centre, respectively.

The second volume is composed of two broad sections covering monosaccharides and oligosaccharides. The monosaccharides section covers their occurrence, significance, properties, synthesis, biosynthesis, degradation,

chemical biology and biomedicine. The oligosaccharides section also covers the topics outlined above for monosaccharides, but also includes specific information on enzymatic glycosylation, glycosyl halides in synthesis, regio- and stereoselective glycosylation, stereoselective synthesis of  $\beta$ -manno glycosides, combinatorial and solid-phase methods, biosynthesis and degradation of galactosyloligosaccharides, glycosylphosphatidylinositols, mammalian carbohydrate–lectin interactions, and multivalency in protein–carbohydrate recognition. The third and final volume contains sections covering complex polysaccharides, glycolipids, glycoproteins, other glycoconjugates, and glycomimetics. These sections also include information on occurrence, significance, properties and synthesis, and also provide information on specific examples of interest and in depth discussion of the necessary biochemical, biological and biomedical background.

This set contains over 2500 figures, chemical structures and reaction schemes, more than 12,000 individual chemical reactions and cites more than 9000 references. The IUPAC's 1996 recommendations on nomenclature of carbohydrates are also provided in the appendix to the third volume. In conclusion, this is undoubtedly one of the most comprehensive collections on this subject ever produced, and is therefore highly recommended as an essential part of any carbohydrate reference library. It should be of interest not only to specialists within the field of glycoscience, but also to newcomers from borderline research areas.

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