



Book Reviews

NMR Spectroscopy of Glycoconjugates

J. Jiménez-Barbero, T. Peters (Eds.); Wiley-VCH, Weinheim, 2003, xv + 320 pages, ISBN 3-527-30414-2, (£80.00)

NMR spectroscopy has been one of the major tools utilised in recent years for the advancement of natural polymer science, through studies into the structure, dynamics and function of many kinds of molecules, especially those pertaining to the fields of carbohydrate chemistry and biochemistry. In many glycoconjugates, such as glycolipids and glycoproteins, the carbohydrate portion is composed of carbohydrates containing two to twelve monosaccharide units, i.e. oligosaccharides. *NMR Spectroscopy of Glycoconjugates* details the application of techniques, developed mainly for the analysis of proteins and nucleic acids, to the analysis of glycostructures, and is divided into three sections.

The first section is comprised of five chapters which cover parameters, techniques and experiments. The opening chapter deals with relaxation and dynamics, covering topics such as oligosaccharide flexibility and dynamics, anisotropic motion, and rigidity versus flexibility. The second chapter covers residual dipolar couplings in bacterial polysaccharides, whilst the third chapter focuses on the detection of hydroxyl protons in both free and bound carbohydrates. The final two chapters in this section discuss 1D homonuclear selective methods, and experiments for large carbohydrates, i.e. polysaccharides, respectively. This latter chapter provides a brief comparison of the results obtainable by NMR techniques with classical chemical techniques, such as acid hydrolysis and HPAEC-PAD or GC-MS analysis to determine monosaccharide composition, and methylation analysis to determine linkage positions, etc.

The second section of the volume is also comprised of five chapters, which cover structural and conformational analysis of carbohydrate molecules. Specific topics discussed in this section include combination of NMR and simulation methods in oligosaccharide conformational analysis, the unique solution structure and immunochemistry of the *Candida albicans* β 1,2-mannopyranan cell wall antigen, NMR of sulphated oligo- and polysaccharides, structure and dynamics of glycolipids, and activated sugars. Sulphated derivatives are one of the most intensely studied groups of carbohydrates, due to their diversity and importance with respect to biological functions. The final section is composed of two chapters concerned with

interactions of carbohydrates with biomolecules. The first of these chapters focuses on NMR analysis of carbohydrate-carbohydrate interactions, whilst the second deals with the study of carbohydrate-protein interactions. Glycoconjugates are present on the surface of leukocytes and other migrating cells and selectively adhere to various other cell types or to the extracellular matrix as they journey through the body. Likewise, the recognition of oligosaccharides and glycoconjugates by enzymes, antibodies and lectins is also of major interest.

This volume excellently portrays the current status of NMR applications in the area of glycoconjugates, by bringing together the expertise of well known specialists in experimental, technical and applied aspects of NMR spectroscopy of carbohydrates. It is therefore highly recommended as being of particular value to both senior carbohydrate scientists and those relatively new to the field.

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Whole-grain Foods in Health and Disease

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All nondigestible carbohydrate becomes fermentable carbohydrate in the colon, and this fermentation process has protective physiological effects. Whole grains are the most significant source of dietary fibre and resistant starch. It is only in the last century that the majority of the population of the Western world has consumed refined grain products, and it is not coincidental that coronary heart disease, cancer and diabetes are more prevalent in the Western world.