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Book Review

Methods in Carbohydrate Chemistry, Volume 9, Lipopolysaccharides, Separation and Analysis, Glycosylated Polymers. Edited by James N. BeMiller, Roy L. Whistler, and Derek H. Shaw, J. Wiley, London, 1993. ISBN 0-471-52941-9, 193 pages plus index, £49.50.

Methods in Carbohydrate Chemistry resumes publication with a new publisher after a gap of several years and with the expectation that future volumes will appear regularly. This is the ninth volume in the series, most of which have been essential purchases for laboratories with an interest in carbohydrate chemistry. Somewhat inexplicably, this present volume has taken nearly a decade to come to press, reflecting the almost inexhaustible patience and the determination of the associate editor Derek Shaw to finish the task.

Section I of this volume contains, under the banner heading 'Lipopolysaccharides', three articles on the isolation and purification of lipopolysaccharides and another three dealing with the estimation of 4-amino-4-deoxy-L-arabinose and 3-deoxy-D-*manno*-2-octulosonic, respectively, in lipopolysaccharides, and the determination of the structure of the carbohydrate backbone of lipid A. Each article in this and succeeding sections tends to follow the traditional *Methods* format, with a brief introduction to the subject followed by the experimental procedures.

Section II moves away from lipopolysaccharides to concentrate on the separation and analysis of simple sugars through to polysaccharides. Five articles appearing together under 'Chromatographic Methods' deal in turn with the identification and characterisation of sugars by combined GLC–MS analysis of their peracetylated aldononitriles and keto-oximes, the determination of the absolute configuration of sugars, the separation of oligosaccharides and small polysaccharides by steric-exclusion chromatography, the analysis of pectins and water-soluble cellulosics by high-performance gel-permeation chromatography, and the affinity chromatography of antiglycosyl (notably anti-gal and anti-lac) antibodies on adsorbents with carbohydrate ligands. A further four articles cover the determination of pyruvic acid in complex polysaccharides, manual and automated procedures for following the enzymatic hydrolysis of polysaccharides, a chitinase-based chitin assay, and, collectively, the application of field desorption, field ionization, and chemical ionization MS to mono-and oligo-saccharides, oligonucleotides, antibiotics, and complex glycosides.

Each of the two remaining sections contains two articles only. The first article in Section III (Natural and Synthetic Glycoproteins) describes the solubilization and

subsequent purification of membrane glycoproteins by lectin-affinity chromatography, while the second describes a mild method for covalently attaching sugars to proteins by amidination. The two articles in Section IV (Immobilization of Carbohydrates) are complementary, dealing as they do with systems for the immobilization of carbohydrate ligands on poly(acrylamide) matrices.

This ninth volume somehow lacks the cohesiveness of most of its predecessors, probably because of the spread of subjects covered and, to some extent, the uneven coverage amongst the various sections. Despite its lengthy preparation, it fulfils the expressed philosophy of the series to present methods that are illustrative and of proven usefulness through repeated use. This volume will be of interest to carbohydrate chemists who work with biomolecules, rather than those rooted in synthetic methodology, although the high price of such a small volume will largely confine it to acquisition by libraries.

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