

Book Reviews

Protein Glycosylation

Roslyn M. Bill, Leigh Revers, Iain B.H. Wilson; Kluwer Academic Publishers, Dordrecht, 1998, xx + 508 pages, ISBN 0-7923-8337-0 (£119.00)

Glycoproteins play an extremely important role in biochemical processes in both fauna and flora. The oligosaccharides covalently linked to proteins are highly branched, the monosaccharide residues being linked to each other via many different linkage types. Protein-linked oligosaccharides therefore have an enormous potential to carry information. Historically, information on the biological functions of the carbohydrate moieties of glycoproteins has been confusing and controversial. This volume aims to bridge the gap between the sparse information on glycoproteins usually included in a general undergraduate/postgraduate textbook and the rather lengthy tomes devoted exclusively to glycoproteins. This volume therefore restricts itself to the structure, biosynthesis and functions of the major protein-bound oligosaccharides, but also covers many historical aspects of the field which are often overlooked.

Protein Glycosylation is composed of 10 detailed chapters, the first chapter covering the structure of sugars, proteins and glycoproteins, and provides a brief history of glycoscience. The next two chapters focus on why, and how, sugars and proteins get it together, respectively, discussing topics such as folding, secretion, conformation, adhesion, targeting, gene expression, etc. In these chapters specific biosynthetic pathways of protein glycosylation in mammals and birds, yeast, insects, and plants are also presented. The fourth and fifth chapters are concerned with *N*-linked sugars, and focus upon the construction of the core and antennae regions of oligosaccharides, respectively, whilst the sixth chapter specifically discusses *O*-linked sugars. Chapter 7 covers the modification of non-reducing terminal sugars, i.e. the ends of the antennae, which are the 'business end' of major oligosaccharide–ligand interactions. The eighth chapter discusses unusual forms of protein glycosylation found in mammals, plants, invertebrates, parasites, yeast and fungi, and slime moulds. The penultimate chapter is devoted to the *in vitro* synthesis of glycoforms, covering chemical routes for oligosaccharide and glycopeptide synthesis and glycosylation, and enzymatic strategies. The final chapter presents a summary and future research directions.

In conclusion, this well referenced volume contains a wealth of useful information presented in a readily accessible form. It is a very useful text for undergraduate/

postgraduate students as well as for researchers with interests in areas of glycobiology and carbohydrate science, and is therefore highly recommended.

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Handbook of citrus by-products and processing technology

Robert J. Braddock; Wiley, New York, 1999, x + 247 pages, ISBN 0471-19024-1 (£58.50)

Modern communications, consumer awareness of high-quality citrus, and product transportation methods have resulted in significant production and processing growth emerging in countries with suitable climates for citrus culture. The large amount of fruit being processed requires an understanding of modern technology and a large by-products industry to utilise the peel residue, essential oils, and other components as well as a search for newer products and uses.

'Handbook of Citrus By-Products and Processing Technology' describes traditional and modern citrus processing technologies, where they apply to juice and by-products. The opening chapters focus on fruit and juice processing, describing some of the important variables relating to extraction methods and other process operations required in commercial juice recovery. These are followed by a discussion on thermal processes, covering the pasteurisation and concentration processes and their relationship to finished product quality. Juice chemical reactions and

product stability are discussed next. The subsequent chapters are devoted specifically to by-products: pulp wash, dried pulp, pellets, molasses, essential oils, essences, D-limonene, pectin, seed products, flavonoids and limonoids. The chapter on 'Peel fiber, cloud, and products' not only considers issues dealing with alternatives to processing citrus fruit residue into dried citrus pulp cattle feed, but also describes traditional and new processes for peel products for human food use. Because citrus processing waste and by-products streams are potential sources of substrates for manufacture of fermentation and bioconversion products, a chapter is devoted to this topic. The last chapter addresses nutritional and medical aspects of natural substances in citrus juices and by-products.

'Handbook of Citrus By-Products and Processing Technology' brings together all the scattered information on citrus by-products including data, research, and technological developments. It will be useful for industrial, government, and academic scientists, plant engineers, processors, quality control specialists, and students searching for descriptions of current industry technology.

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Gums and Stabilisers for the Food Industry 10

P.A. Williams, G.O. Phillips (Eds.); Royal Society of Chemistry, Cambridge, 2000, x + 470 pages, ISBN 0-85404-820-0 (£79.50)

Gums and Stabilisers for the Food Industry 10 is the latest volume in a well-respected series, based on regular conferences held at The North East Wales Institute (NEWI), Wrexham, Wales, which have aimed to focus attention on and inspire new work in the field via the bringing together of scientists, producers and users to present their latest findings in the field.

This volume is divided into six broad-ranging sections, the first of which contains nine chapters on aspects of polysaccharide characterisation, with specific chapters in this section covering a variety of techniques for the characterisation of pectin, gum arabic, rice starch, and the structural features of some unusual polysaccharides. The second section focuses upon polysaccharide gelation, with selected chapters covering biopolymer gelation, and the rheological characteristics of gellan gum, carrageenan and pectin gels, hydroxypropylated and cross-linked potato starch, and the gelling mechanisms of non-starch polysaccharides from wheat bran. The third section is composed of eight chapters, which cover the physical characteristics of a number of mixed biopolymer systems, such as starch/carrageenan mixtures, κ -carrageenan and β -lactoglobulin, casein micelles and *exo*-polysaccharides, micellar casein/ κ -carrageenan mixed systems, κ -carrageenan gelation in milk, κ -carrageenan and locust bean gum, and deacetylated xanthan with a high galactose galactomannan.

The fourth section discusses the behaviour of polysaccharides in a range of high solid systems, with specific chapters detailing the effects (rheology, gelation, etc.) of low water and high sugar environments on sago starch, amylose and amylopectin gels, gellan gum gels, and milk protein. The penultimate section contains six chapters on proteins and emulsions, covering recent advances in protein interactions, surfactant–protein interactions, depletion-flocculated polydisperse emulsions, lupin protein emulsions, whey protein gelation, and rennet casein. The final section details recent developments and future trends, including commercial requirements and interests, gelatin substitution, guar speciality products, and topical issues such as market trends, and genetic modification of polysaccharides.

In conclusion, this volume is a valuable reference for researchers, both academics and industrialists, with interests in the use of gums and stabilisers in food science and technology, and is therefore highly recommended.

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