

Book reviews

Sweet-taste Chemoreception. Edited by M. Mathlouthi, J.A. Kanters & Gordon G. Birch, Elsevier Applied Science, London, 1993. xv + 425 pp. Price £75.00. ISBN 1-85166-883-7.

Taste is evoked by chemicals and the different tastes are merely manifestations of substances of varying sizes fitting into receptors of appropriate size on the tongue and in the oral cavity. Chemicals with different osmotic, endothermic and exothermic properties interact with biological membranes in different ways resulting in different reactions taking place. Organised, localised concentrations of sweet molecules exist in the micro-environment of the sweet receptor and may account for the persistence of the sweet taste often encountered with novel sweeteners. This volume is composed of papers from a minisymposium organised under the auspices of the European Chemoreception Research Organisation (ECRO) and the University of Reims Champagne-Ardenne in 1991.

There is a degree of unanimity in favour of the hypothesis that for sugars and amino acids or peptides, hydrogen bonding plays a key role in the molecular recognition processes associated with sweet tastes. The first section of this book discusses two important characteristics of hydrogen bonding, namely cooperativity and polarisability. They may be important in molecular recognition by allowing electrostatic information to be transmitted along molecular chains in the vicinity of a receptor site.

The biochemical mechanism of sweetener action depends on the spatial and electronic properties of both the sweet molecule and the receptor site. Elucidation of the conformation of the 'active state' of sucrose is a prerequisite to designing new sweeteners. The second section involves the molecular mechanics and dynamics of artificial sweeteners correlating the population of a third conformation to sweetness. The classic attempt to rationalise the sweetness of organic compounds presumes the existence of a common AH-B-X glucophore in all sweet substances, eliciting the sweet response via interaction with an AH-B-X site in the tastebud receptor. The second section examines this premise using sucrose, sucralose and fructose as examples.

Other topics discussed include an overview of the structure of sweeteners, progress in isovanillyl sweeteners, hyperpotent sweeteners, the role of water structure in chemoreception, arylsulphonylalkanoic acid artificial sweeteners and the physiology of sweet taste and molecular receptors.

This is a very interesting and comprehensive tome discussing many aspects of 'sweet chemistry', providing

a detailed insight into this relatively new area of food science. It is recommended as an ideal addition to any chemical or science-orientated library.

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Glycoprotein Analysis in Biomedicine. Edited by E.F. Hounsell, Humana Press, Totowa, New Jersey, 1993. xi + 306 pp. Price £49.50. ISBN 0-89603-226-4.

Oligosaccharide chains of glycoproteins form a diverse array of molecules which contain an enormous amount of chemical information that has important functionality in biochemical recognition. The carbohydrate moieties of glycoproteins have profoundly important effects on the conformation, stability, antigenicity and function of their protein components, in addition to their specific interactions with antibodies and carbohydrate binding proteins.

This 14th volume in the '*Methods in Molecular Biology Series*' aims to bring together a comprehensive range of protocols that will render carbohydrate biochemistry accessible to all. A variety of chemical and enzymatic methods are investigated and analysis of glycoproteins from mammalian, parasitic, bacterial and viral origins are each discussed.

The beginning of the book discusses some specialised techniques, such as NMR and MS, which are capable of examining the diversity of oligosaccharide sequences and of detecting the growing number of new structures, as well as those previously documented, which may occur in new scenarios. Coupled with the chromatographic techniques of analysis and purification that are also discussed, there is a powerful arsenal available for glycoprotein characterisation.

The second half of the book deals with specific medical aspects, introducing sensitive staining techniques and radioactive labelling methods for several different groups of glycoproteins — cytoplasmic, membrane bound, mucinous, proteoglycan-type, and the like. Other topics discussed include the linkage analysis of glycans using FAB-MS, GC and GC-MS of glycoprotein oligosaccharides, the analysis of carbohydrates in glycoproteins using HPLC and high performance capillary electrophoresis, immunological detection of glycoproteins, and scanning tunneling microscopy (STM) of biopolymers.

Overall this is an extremely detailed and informative volume with a good glossary and index and is therefore thoroughly recommended to anyone interested in glycoproteins.

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