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Book Reviews

Protein Glycosylation: Cellular, Biotechnological and Analytical Aspects. GBF Monographs, Vol. 15. Edited by H. S. Conrat. VCH, Weinheim, 1991. xii + 293 pp. ISBN 3-527-28367-6. Price: DM 138·70.

This book is a compendium of papers presented at a workshop on glycoproteins held at Braunschweig in June 1990 and a very timely workshop it was in view of the increasing realisation in the last few years of the importance of not just glycosylation but of correct glycosylation for the therapeutic effectiveness of pharmaceutically important glycoproteins. There are, of course, also many other reasons for studying glycosylation and glycoprotein structure, so this book contains a total of thirty-nine contributions divided into five categories: cellular aspects, glycosylation in non-mammalian cells, analytical aspects, biotechnological aspects I (glycosyltransferases) and biotechnological aspects II (recombinant glycoproteins).

Logically the sequence begins with a scene-setting review of the processing and reprocessing pathways of asparagine-linked oligosaccharides which are essential in determining the complexity and variability of the carbohydrate moieties of so many glycoproteins. The remaining ten papers in the cellular aspects category, which is confined exclusively to events occurring in mammalian cells, represent something of a mixed bag; so, while several address directly the biological/biochemical basis of glycosylation, others fit less comfortably into this section. Attention is focussed almost entirely on complex N-asparagine-linked oligosaccharides with few references to O-linked sugars. The next category on non-mammalian cells is even more mixed in character, with the first two contributions being review-like (including an excellent and highly informative paper by Thomas on glycosyl phosphatidylinositol anchors via which proteins and glycoproteins are attached to membranes) and the remaining four being much more highly specific. Of the six papers in this category, Thomas' ranges widely, including mammalian as well as microbial cells; one is concerned with the glycosylation of influenza haemagglutinin expressed in insect cells, three deal with yeast cells or glycoproteins expressed in them and one covers the biotechnological applications (as porous membranes) of bacterial surface layers.

The eight contributions within the analytical aspects category begin with an up-to-date and valuable review by Angel *et al.* of a general strategy and methods required for determining the oligosaccharide structures of glycoproteins, a theme which is excellently continued in the rest of the papers in this section. Between them these papers give an almost ideal picture of how to determine the oligosaccharide structures of any glycoprotein, so will be an invaluable source of information for all readers with interests in this area. This category is also notable for being made up of contributions of a universally very high standard of clarity and composition as well as content. Further excellent contributions are present in the two sections on biotechnological aspects, but in both there are also a number of very brief, superficial reports, which is a little disappointing. The first of these sections deals with glycosyltransferases and covers fundamental studies of their specificities and action in in-vitro experiments but is aimed primarily at their use or potential use in remodelling oligosaccharides to improve therapeutic performance. A similar general objective lies behind the papers making up the last section on biotechnological aspects of recombinant glycoproteins, which is another excellent section containing much useful and interesting material, beginning with a very good and stimulating short review by Stanley of the use of CHO cell mutants to study glycosylation patterns and to engineer particular oligosaccharide structures. This is followed by a very informative and up-to-date contribution from Conradt's own group on the methodology of structural analysis of the oligosaccharide portions of a number of therapeutically important recombinant glycoproteins. The relevance of correct glycosylation in recombinant glycoproteins for their pharmacokinetic and immunogenic properties is well covered in the next article by Parekh. The section is completed by four more good contributions covering rather more specific aspects of the same general theme.

In summary, this is an excellent and very timely monograph dealing with a topic area which is now recognised to be of great importance. As might be expected with such a compendium of papers from a workshop meeting, some contributions are very much better than others, but fortunately the good outnumber the not-so-good substantially, so the pleasing result is a book of high overall quality, containing a wealth of useful and up-to-date information, that can be recommended most strongly to the growing number of scientists and graduate students working in, or interested in, this vital area.

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Role of Fats in Food and Nutrition (2nd Edition). By M.