

essence of modern molecular biology into a single book, even if there are some flavours missing. This is impressive – for a book. Relatively soon, perhaps, this will be old technology. With the current inexorable and laudable drive towards CD-ROM multimedia systems using colour animation and sound, eventually encyclopedias of this ilk could, and should, be expanded to become

information resources so invitingly attractive and powerful that they are absolutely essential for any decent educational establishment. So, although this encyclopedia is hardly compulsive reading, the multimedia version could be a cracker!\* In the meantime, don't wait for the paperback version – lifting the hardback text builds muscle strength and, anyway, you would need to wear a

very big jacket to fit this baby in your pocket.

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\*Some time after the submission of this review, Blackwells advertised the release of a new CD-ROM version of the book.

## 'Neoglycobiology'

### Neoglycoconjugates: Preparation and Applications

edited by **Y. C. Lee** and **R. T. Lee**,  
Academic Press, 1994. £92.00  
(xiv + 549 pages)  
ISBN 0 12 440585 1

When the scientists who essentially originated a field and coined the relevant terminology produce their first major book on the subject, it is usually worth reading. When they have also enlisted the efforts of many others who have subsequently contributed to the field, the resulting collection is likely to be of considerable value. Such is the case with this effort edited by the Lees. While they were certainly not the first scientists to attach a carbohydrate to another molecule, they pioneered the development of several technologies that allowed this to be done in a routine and reliable manner. To describe the novel compounds that they created, they originally coined the term 'neoglycoprotein'. (In his typically incisive manner, Saul Roseman pointed out that these are really 'pseudoglycoproteins'!) However, the new name stuck, and eventually mutated into variations such as 'neoglycolipid' and 'neoproteoglycan'. As the title of this book indicates, the term 'neoglycoconjugate' has now been adopted as a generic term to indicate any synthetic or semisynthetic combination of a carbohydrate chain with another molecule, be it natural or artificial. This results in a book of rather broad scope and substantial technical detail. Fortunately, the editors have chosen a range of experienced experts to write most of the chapters.

The book is divided into three sections: an introduction, a section on 'Preparation', and one on 'Applications'. Of these, the introduction is of the most general value, presenting a clear and

concise overview of the different types of neoglycoconjugates, as well as dealing carefully with the important issue of the 'cluster effect' observed with multivalent neoglycoconjugates. (Chapter 2 should be essential reading for anyone who wants to explore the complex field of carbohydrate-protein interactions.)

The division of the rest of the book into two sections is somewhat artificial. Each subsequent chapter actually stands on its own, being essentially a monograph written by an expert in a specific area. As a consequence, the chapters dealing with 'Preparation' include important examples of applications derived from the experience of the authors. Likewise, the chapters in the 'Applications' section contain many specific details concerning the preparation of the materials used. This is at once both the strength and the weakness of the book. The editors evidently gave the authors of the individual chapters considerable independence, and did not attempt to tie the results together, except in the introduction. Thus, there is some redundancy between the chapters, and a serious lack of cross-referencing. On the positive side, each chapter stands on its own and can be used as an independent resource if needed. However, some chapters actually have little to do with neoglycoconjugates, except in using them as a tool. For example, most of Chapter 17 is devoted to a discussion of the value of antisense RNA technology, with a brief discussion of the use of asialoglycoproteins (not necessarily neoglycoconjugates) to deliver them to hepatocytes.

It is very clear from this book that neoglycoconjugates are invaluable in a wide range of experimental and diagnostic applications, and potentially even in some therapeutic applications. However, the use of these unnatural molecules can also lead to the study of 'neobiology'. One example can be found in Chapter 8, which describes the use of lactose-derivatized polystyrene to immobilize hepatocytes on culture

dishes. Here, the hepatocyte asialoglycoprotein receptor (whose normal function is endocytosis of glycoproteins) has been subverted into functioning as a surrogate adhesion receptor. Thus, no matter how interesting the biological phenomena observed in the culture dish, one wonders about the relevance of studying hepatocytes that are attempting in vain to endocytose a plastic dish many times their size! Likewise, the value of studying the binding of neoglycoproteins carrying foreign sugars such as cellobiose and maltose to human tumor cells and tissues (Chapter 12) is questionable. No doubt the results are telling us something about the glycobiology of tumors, but it is far from clear what.

Finally, the book suffers from being substantially out of date with regard to references. While this is a risk inherent in producing any multi-author book, it is disconcerting that there are very few literature references even from 1993.

These quibbles aside, there are many positive features to this book that make it very worthwhile reading for anyone interested in glycobiology. The large amount of technical information available in some of the chapters is notable. While this may make it very heavy going for the casual reader, there is a veritable treasure-trove of information for the expert reader, resulting in a valuable reference source for the laboratory. In the final analysis, this is a one-of-a-kind collection of articles on an area of interest to a wide range of scientists, including glycobiologists, biochemists, cell biologists and carbohydrate chemists. For those whose primary interests are in understanding the biology of carbohydrates, it should be an essential part of a personal library.

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