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Book reviews

The Glycoconjugates: Volume III, *Glycoproteins, Glycolipids, and Proteoglycans*, Part A, edited by MARTIN I. HOROWITZ. Academic Press, New York, 1982, xx + 369 pages, $49.50.

This is the third volume of *The Glycoconjugates* series. It is an interesting volume, in that it devotes a large portion to glycosylation, a topic already covered in Vol. II by Harry Schachter. This is a logical consequence of fantastic activity in these areas of the biochemistry of glycosylation.

In Part I, the glycosylation of proteins is viewed from the standpoints of processing mechanism, final modification of terminal sequences, inhibition of glycosylation, temporal relationship between glycosylation and translation, intracellular transport of glycoproteins, and, also, nonenzymic "glycosylation" of proteins. Inclusion of the last topic is appropriate in view of the consequences of high concentrations in serum of D-glucose produced by diabetic conditions. However, use of the word "glycosylation" is objectionable, as "glycosylation" is, chemically, a clearly defined term, and the process of addition of sugars to proteins that was being discussed is really an alkylation mediated by Amadori rearrangement. The final product from this process contains an acyclic sugar derivative.

In Part II, the discussion of glycosylation continues into developmental biology. The topics dealt with in this part are less homogeneous and systematic than those in Part I. The biological systems discussed include slime molds; fertilization and early embryogenesis; glycosyltransferases in fetal, neonatal, and adult colon; proteoglycans in developing, embryonic cartilage; and glycosphingolipid glycosyltransferases in development and transformation. Although not directly involving the glycosyltransferases, a section on membrane glycoconjugates in the maturation and activation of T and B lymphocytes is included.

The last area of coverage (Part III, Glycoconjugates in Cellular Adhesion and Aggregation) contains only two sections, both on the subject of fibronectin and closely related materials.

The authors of the sections in Part I are all leaders in the respective areas, and the coverage of the topics is thorough and as up to date as the mechanism of book publication allows. The areas of glycosylation related to developmental biology, and cell adhesion and aggregation, are less well developed and refined, and, at times, are controversial. It is not easy to choose an array of topics in these areas that will satisfy every reader, and it may not be too surprising to see an explosive development that must be covered in future volumes (just as the recent, rapid development of our knowledge of glycosylation was discussed in this volume).

The book is well produced, as were the previous volumes of the series, with clear Figures and Tables. There seem to be very few errors. The book goes far deeper

than what is required of the average, graduate student in biochemistry. It offers, however, the most comprehensive coverage on the topic of glycosylation at this point, and thus is a necessary volume for any serious student of glycoconjugates. As is now usual, the price of the book may not be too acceptable for most research workers laboring under the current, funding climate.

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Oxidation in Organic Chemistry: Part D, edited by WALTER S. TRAHANOVSKY, Academic Press, New York, 1982. xi + 354 pages + Subject Index, $74.00.

This is the fourth part of a treatise on oxidation in organic chemistry [Part A, K. B. Wiberg (Ed.) (1965); Part B, W. S. Trahanovsky (Ed.) (1973); Part C, W. S. Trahanovsky (Ed.) (1978)], and the reviewer is as gratified with Part D as he was delighted with Part C [*Carbohydr. Res.*, 74 (1979) c9–c11]. Here again, the Editor and the contributors to Part D are to be congratulated on maintaining the high standard of the earlier volumes. The book consists of four contributed chapters, and all of the authors are authorities in the field. The oxidation reactions covered may be limited to special classes of organic compounds; however, many of them can be applicable to carbohydrates and other structurally related compounds (*e.g.*, oxidation with lead tetraacetate; phase-transfer-assisted, permanganate oxidations; and oxidative couplings).

A chapter by G. M. Rubottom (which takes up over one-third of the book, with 496 references through the year 1979) presents all of the important facets of the classical reagent lead tetraacetate (discovered in 1851, and employed in 1920) as applied to organic synthesis. The text discusses the reaction of lead tetraacetate [$Pb(OAc)_4$] with hydroxyl groups, including those in alcohols, 1,2-diols, enols, and phenols. The use of the reagent for glycol cleavage in structural determination and in the degradation of sugars can be supplemented by earlier, published work [C. T. Bishop, *Methods Carbohydr. Chem.*, 6 (1972) 350–352; P. S. O'Colla, *ibid.*, 5 (1965) 382–392; A. S. Perlin, *Adv. Carbohydr. Chem.*, 14 (1959) 9–61]. The reaction of mono- and di-carboxylic acids with lead tetraacetate has been treated in detail; the probable mechanism is stepwise, and involves a carbonium ion (R^+) as an intermediate generated from a free radical ($R\cdot$) following decomposition of the original, organolead adduct; the formation of alkanes, alkenes, or acetates is expected from these reactions. $Pb(OAc)_4$ has been used for the oxidation of aliphatic and aromatic amines, amides, hydrazines, and azomethines. The reagent also has wide application for hydroxylation (*e.g.*, *via* acetoxylation) of saturated and aromatic hydrocarbons and alkenes. The oxidant has been used in reactions with organometallics (for the