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Book Review

Glycochemistry: Principles, Synthesis, and Applications Peng George Wang, Carolyn R. Bertozzi; Marcel Dekker Inc., USA, 2001, xvi + 682 pages, ISBN 0-8247-0538-6, $195

Carbohydrate chemistry has become an important branch of organic chemistry since the stereo-chemical configuration of D-(+)-glucose was established by Emil Fischer at the end of the 19th century. Steady advances in carbohydrate synthetic and analytical methods have been made over the past 100 years. However, it is the past two decades that have seen remarkable new discoveries in the biology of carbohydrates and provided renewed impetus to the synthesis of complex glycoconjugates and pursuit of their medicinal and industrial applications. Glycobiology has emerged as an internationally recognised field of study and a potentially promising route to the discovery of novel medicines. Critical biological processes—including regulation of the growth and mobility of cells, immune responses, and reactions of cells to hormones and growth factors—all depend on carbohydrates. In addition, many viruses and bacteria use cell surface carbohydrates to get into cells and initiate infections.

Glycochemistry presents the recent trends in glycochemistry focused on synthesis, principles and applications. The first six chapters provide a comprehensive, up-to-date review on the chemical synthesis of complex carbohydrates for their potential use in biological systems, which include solid-phase synthesis of glycoconjugates and chemo-enzymatic synthesis of glycoconjugates. The following seven chapters reveal some fundamental principles that are used to design and exploit carbohydrates for their effects in biological settings, which cover carbohydrate recognition processes for bacterial and viral infections and current methodologies in the synthesis of aminoglycoside antibiotics. The remaining five chapters examine the applicability of enzymes towards chemo-enzymatic synthesis, modification of carbohydrates and polysaccharides and biotransformation of polysaccharides.

This state-of-the-art reference presents the latest methods in the development of carbohydrate based therapeutics—highlighting up-to-date applications in chemical and enzymatic synthesis of complex carbohydrates, carbohydrate function, and carbohydrate-mediated biological recognition processes. It is intended for graduate students and researchers in carbohydrate chemistry, biochemistry, medicinal chemistry, and glycobiology in both academic and industrial laboratories.

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