Carbohydrates The Essential Molecules Of Life Second Edition

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The Sugar Code CRC Press
The Handbook of Glycomics provides the first comprehensive overview of the emerging field of glycomics, defined as the study of all complex carbohydrates in an organism or cell ("the glycome"). Beginning with analytic approaches and bioinformatics, this work provides a detailed discussion of relevant databases, data integration, and analysis. It then moves on to a discussion of specific model organism and pathogen glycomes followed by therapeutic approaches to human disorders of glycosylization. Structure and function of glycomes are included along with state-of-the-art technologies and systems approaches to the analysis of glycans. - Synthesizes contributions from experts in biology, chemistry, bioinformatics, biotechnology, and medicine - Highlights chapters devoted to chemical synthesis, cancer glycomics and immune cell glycomics - Includes discussions of proteomics, mass spectrometry, NMR, array technology, and transcriptomics analytic approaches
Carbohydrates CSHL Press
Carbohydrates are a vital part not only of metabolism, but are implicated as key coding molecules in a host of subtle biological events. The exploration of the role and the manipulation of this wonderful class of molecules is an exciting and ever changing field. This primer seeks to strip off some of the mystery that often surrounds carbohydrate chemistry, a subject taught in all undergraduate courses, by highlighting and summarizing some of the central principles and ideas and by illustrating them with both classical and state-of-the-art examples.
Molecular Biology of the Cell World Scientific Publishing Company
This book is on carbohydrates-the essential molecules that give you energy. They are the building blocks of life. This book delivers up-to-date coverage on all aspects of carbohydrate chemistry. The molecules are sometimes sugars, i.e. "sweet," hence the subtitle "The Sweet Molecules of Life."Carbohydrates first gives the "nuts and bolts" of carbohydrate chemistry, enabling the reader to appreciate the subsequent chapters on protecting groups and the reactions of monosaccharides. (The protecting groups do just that-they are put on the molecules as a temporary measure during one or more reactions to stop the wrong bit of the molecule being changed during that reaction.)* Introduces the basic chemistry of carbohydrates * Describes the concepts, protecting groups, and reactions of carbohydrates* Includes all aspects of the synthesis of the glycosidic linkage* Gives an introduction to glycobiology and vaccines* Includes references to carbohydrate literature
Biology for AP ® Courses Springer Science & Business Media
A new focus on glycoscience, a field that explores the structures and functions of sugars, promises great advances in areas as diverse as medicine, energy generation, and materials science, this report finds. Glycans-also known as carbohydrates, saccharides, or simply as sugars-play central roles in many biological processes and have properties useful in an array of applications. However, glycans have received little attention from the research community due to a lack of tools to probe their often complex structures and properties. Transforming Glycoscience: A Roadmap for the Future presents a roadmap for transforming glycoscience from a field dominated by specialists to a widely studied and integrated discipline, which could lead to a more complete understanding of glycans and help solve key challenges in diverse fields.
Glycoscience John Wiley & Sons
This volume contains the presentations of the principal speakers at the NATO Advanced Study Institute held at Porto Portese, Italy,23 August - 2 September, 1982. This meeting was the third in a series devoted to the molecular biology of plants. The initial meeting was held in Strasbourg, France in 1976 (J. Weil and L. Bogorad, organizers), and the second in Edinburgh, Scotland in 1979 (C. Leaver, organizer). As in these previous meetings, we have attempted to cover the major topics of plant molecular biology so as to promote the integration of information emerging at an accelerating rate from the various sub-disciplines of the field. In addition, we have introduced several topics, unique to higher plants, that have not yet been approached with the tools of molec ular biology, but that should present new and important aspects of plants amenable to study in terms of DNA -+ RNA -+ Protein. This meeting also served to inaugerate the new International Society for Plant Molecular Biology. The need for this society is, like the NATO meetings themselves, an indication of the growth, vitalitv and momentum of this field of research.
Anatomy and Physiology National Academies Press
This fully updated and expanded second edition of a highly popular text book focuses on the structure and mechanism in carbohydrate chemistry and biochemistry. Carbohydrates play important roles in biological systems as energy sources, as structural materials, and as informational structures (when they are often attached to proteins or lipids). Their chemical reactivity and conformational behaviour is governed by mechanistic and stereochemical rules, which apply as much to enzymic as to non-enzymic reactivity. The same principles of reactivity and conformation govern changes brought about in the process industries, such as pulp, paper and food. Extensively referenced with citations and a detailed index, the book contains everything the reader needs to know to start a carbohydrate research project with one of the real strengths being the treatment and integration of the important physical-chemical principles and methods (though lead references only are given to the finer points of carbohydrate synthesis). The book is suitable for both researchers who are new to the subject and those more established as well as a readership from diverse backgrounds and interests, including chemists, biochemists, food scientists and technologists involved with the processing of polysaccharides in the paper, textile, cosmetics, biofuels and other industries.
Fundamentals of Animal Nutrition CRC Press
In much of biology, the search for understanding the relation between structure and function is now taking place at the macromolecular level. Proteins, nucleic acids, and polysaccharides are macromolecule--polymers formed from families of simpler subunits. Because of their size and complexity, the polymers are capable of both inter- and intramolecular interactions. These interactions confer upon the polymers distinctive three-dimensional shapes. These tertiary configurations, in turn, determine the function of the macromolecule. Computers have become so inextricably involved in empirical studies of three-dimensional macromolecular structure that mathematical modeling, or theory, and experimental approaches are interrelated aspects of a single enterprise.
Microbiology CRC Press
Biological Macromolecules: Bioactivity and Biomedical Applications presents a comprehensive study of biomacromolecules and their potential use in various biomedical applications. Consisting of four sections, the book begins with an overview of the key sources, properties and functions of biomacromolecules, covering the foundational knowledge required for study on the topic. It then progresses to a discussion of the various bioactive components of biomacromolecules. Individual chapters explore a range of potential bioactivities, considering the use of biomacromolecules as nutraceuticals, antioxidants, antimicrobials, anticancer agents, and antidiabetics, among others. The third section of the book focuses on specific applications of biomacromolecules, ranging from drug delivery and wound management to tissue engineering and enzyme immobilization. This focus on the various practical uses of biological macromolecules provide an interdisciplinary assessment of their function in practice. The final section explores the key challenges and future perspectives on biological macromolecules in biomedicine. - Covers a variety of different biomacromolecules, including carbohydrates, lipids, proteins, and nucleic acids in plants, fungi, animals, and microbiological resources - Discusses a range of applicable areas where

biomacromolecules play a significant role, such as drug delivery, wound management, and regenerative medicine - Includes a detailed overview of biomacromolecule bioactivity and properties - Features chapters on research challenges, evolving applications, and future perspectives

Cell Biology by the Numbers

Hydrogen bonds are weak attractions, with a binding strength less than one-tenth that of a normal covalent bond. However, hydrogen bonds are of extraordinary importance; without them all wooden structures would collapse, cement would crumble, oceans would vaporize, and all living things would disintegrate into random dispersions of inert matter. Hydrogen Bonding in Biological Structures is informative and eminently usable. It is, in a sense, a Rosetta stone that unlocks a wealth of information from the language of crystallography and makes it accessible to all scientists. (From a book review of Kenneth M. Harmon, Science 1992)

Carbohydrate Recognition Springer

Concepts of Biology is designed for the typical introductory biology course for nonmajors, covering standard scope and sequence requirements. The text includes interesting applications and conveys the major themes of biology, with content that is meaningful and easy to understand. The book is designed to demonstrate biology concepts and to promote scientific literacy.

Chemistry Elsevier

This second edition of Medical Biochemistry is supported by more than 45 years of teaching experience, providing coverage of basic biochemical topics, including the structural, physical, and chemical properties of water, carbohydrates, lipids, proteins, and nucleic acids. In addition, the general aspects of thermodynamics, enzymes, bioenergetics, and metabolism are presented in straightforward and easy-to-comprehend language. This book ties these concepts into more complex aspects of biochemistry using a systems approach, dedicating chapters to the integral study of biological phenomena, including cell membrane structure and function, gene expression and regulation, protein synthesis and post-translational modifications, metabolism in specific organs and tissues, autophagy, cell receptors, signal transduction pathways, biochemical bases of endocrinology, immunity, vitamins and minerals, and hemostasis. The field of biochemistry is continuing to grow at a fast pace. This edition has been revised and expanded with all-new sections on the cell plasma membrane, the human microbiome, autophagy, noncoding, small and long RNAs, epigenetics, genetic diseases, virology and vaccines, cell signaling, and different modes of programmed cell death. The book has also been updated with full-color figures, new tables, chapter summaries, and further medical examples to improve learning and better illustrate the concepts described and their clinical significance. - Integrates basic biochemistry principles with molecular biology and molecular physiology - Illustrates basic biochemical concepts through medical and physiological examples - Utilizes a systems approach to understanding biological phenomena - Fully updated for recent studies and expanded to include clinically relevant examples and succinct chapter summaries

Carbohydrates: The Essential Molecules of Life McGraw Hill Professional

This book presents a comprehensive approach to the versatile and fascinating field of carbohydrate chemistry. It covers, besides the colorful historical perspective within the utilization of carbohydrates and their derivatives, all modern aspects on their properties, nomenclature, uses, and natural occurrence as such or as residues in a variety of biologically active molecules. Special emphasis is paid to various conversion techniques for producing value-added chemicals, biofuels, and other products from carbohydrate-rich renewable resources.This book can be primarily used as an advanced textbook for a wide range of readers in many disciplines; not only students and teachers but also everyone who works in the laboratory as a researcher or in production and planning or who generally needs relevant knowledge of carbohydrates.

Transforming Glycoscience National Academies Press

Biology for AP® courses covers the scope and sequence requirements of a typical two-semester Advanced Placement® biology course. The text provides comprehensive coverage of foundational research and core biology concepts through an evolutionary lens. Biology for AP® Courses was designed to meet and exceed the requirements of the College Board's AP® Biology framework while allowing significant flexibility for instructors. Each section of the book includes an introduction based on the AP® curriculum and includes rich features that engage students in scientific practice and AP® test preparation; it also highlights careers and research opportunities in biological sciences.

Essentials of Glycobiology Academic Press

"Microbiology covers the scope and sequence requirements for a single-semester microbiology course for non-majors. The book presents the core concepts of microbiology with a focus on applications for careers in allied health. The pedagogical features of the text make the material interesting and accessible while maintaining the career-application focus and scientific rigor inherent in the subject matter. Microbiology's art program enhances students' understanding of concepts through clear and effective illustrations, diagrams, and photographs. Microbiology is produced through a collaborative publishing agreement between OpenStax and the American Society for Microbiology Press. The book aligns with the curriculum guidelines of the American Society for Microbiology."--BC Campus website.

Carbohydrate Chemistry Academic Press

This book provides the "nuts and bolts" background for a successful study of carbohydrates - the essential molecules that not only give you energy, but are an integral part of many biological processes.A question often asked is 'Why do carbohydrate chemistry?' The answer is simple: It is fundamental to a study of biology. Carbohydrates are the building blocks of life and enable biological processes to take place.Therefore the book will provide a taste for the subject of glycobiology.Covering the basics of carbohydrates and then the chemistry and reactions of carbohydrates this book will enable a chemist to gain essential knowledge that will enable them to move smoothly into the worlds of biochemistry, molecular biology and cell biology. - Includes perspective from new co-author Spencer Williams, who enhances coverage of the connection between carbohydrates and life - Describes the basic chemistry and biology of carbohydrates - Reviews the concepts, synthesis, reactions, and biology of carbohydrates

Handbook of Glycomics Springer

Concise yet complete, this is a succinct introduction to the topic, covering both basic chemistry as well as such advanced topics as high-throughput analytics and glycomics -- in one handy volume. This improved and expanded 3rd edition features all-new material on combinatorial synthesis of carbohydrates and carbohydrate biodiversity, and each chapter now contains study questions for self-learning and classroom teaching. Didactically written by an experienced lecturer and graduate student advisor, the text is backed by practical examples and more than 150 study questions tailored to students' needs.

Carbohydrate Chemistry, Biology and Medical Applications John Wiley & Sons

This text will give the reader a firm understanding of all aspects of carbohydrate conformation by describing and explaining the importance of interactions between carbohydrates and interactions of carbohydrates with proteins, nucleic acids or any other macromolecule., The authors have gathered a wealth of information on carbohydrate structures, different methods of conformational analysis, the role of carbohydrates as recognition molecules in biological systems and their industrial applications., Whether you are a student, teacher or a basic researcher, this text book is a 'one-stop' source of current information on carbohydrate conformation and the potential use of conformational properties in industry and also of their crucial role in important biological events such as cell-cell interaction, cell adhesion, cellular signaling mechanism.

Food Carbohydrates Springer Science & Business Media

This book contains contributions from interdisciplinary scientists to collectively address the issue of targeting carbohydrate recognition for the development of novel therapeutic and diagnostic agents. The book covers (1) biological problems involving carbohydrate recognition, (2) structural factors mediating carbohydrate recognition, (3) design and synthesis of lectin mimics that recognize carbohydrate ligands with high specificity and affinity, and (4) modulation of biological and pathological processes through carbohydrate recognition.

Medical Biochemistry Royal Society of Chemistry

The book provides comprehensive information about the different aspects of veterinary nutrition in tropical countries.The introductory chapter discuss the importance of nutrition, feeds and feeding of balanced and optimum feeds specifically required for the sustenance of life. The second chapter, discusses briefly the history of research in animal nutrition.The book further talks about the relationship between the environment and nutrition in animals; the chemical composition of plants and animals; and the various sources of feed for animals. It provides details on the different phases of life cycle in animals, and the effect of nutrition on the performance. Various Nutrients and its importance in livestock nutritionand production has been illustrated in details. Various nutrients such as water, carbohydrate, protein, fats, vitamins, minerals etc are individually dealt in a separate chapter. The digestive system,digestion and metabolism of carbohydrates, protein and fats in ruminant and non ruminant livestock have been illustrated. A dedicated chapter fully describes the activity of enzymes which are directly involved in nutrition. Also this book deals with the harmful components of animal feed which are found mainly in the unconventional feeds. The books also provide chapters like partitioning of feed& energy and also the therapeutic and clinical nutrition which are very importantfor the under graduate & post graduate students and researchers of animal nutrition and livestock production and management. This book is useful for researchers, undergraduate and post graduate students studying veterinary sciences, animal husbandry, zoology and biochemistry.

Handbook of Carbohydrate Engineering Academic Press

As a reflection of the quantum leap that has been made in the study of glycostructures, the first edition of this book has been completely revised and updated. The editors give up-to-date information on glycostructures, their chemistry and chemical biology in the form of a completely comprehensive survey. Glycostructures play highly diverse and crucial roles in a myriad of organisms and important systems in biology, physiology, medicine, bioengineering and technology. Only in recent years have the tools been developed to partly understand the highly complex functions and the chemistry behind them. While many facts remain undiscovered, this MRW has been contributed to by a large number of the world's leading researchers in the field.