Carbohydrate Analysis A Practical Approach Paper Practical Approach Series

Since its inception in 1945, Advances in Carbohydrate Chemistry and Biochemistry has provided critical and integrating articles written by research specialists that integrate industrial, analytical, and technological aspects of biochemistry, organic chemistry, and instrumentation methodology in the study of carbohydrates. The articles provide a definitive interpretation of the current status and future trends in carbohydrate chemistry and biochemistry. High quality comprehensive reviews covering all aspects of carbohydrate chemistry

Discusses the molecular components of life, including nucleic and amino acids, proteins, lipids, and carbohydrates, and details the history of study in the discipline and how they affect human and animal body functions.

The three-dimensional structure of proteins is a key factor in their biological activity. There is an increasing need to be able to predict the structure of a protein once its amino-acid sequence is known; this book presents practical methods of achieving that ambitious aim, using the latest computer modelling algorithms. - ;The prediction of the three-dimensional structure of a protein from its sequence is a problem faced by an ever-increasing number of biological scientists as they strive to utilize genetic information. The increasing sizes of the sequence and structural databases, the improvements in computing power, and the deeper understanding of the principles of protein structure have led to major developments in the field in the last few years. This book presents practical computer-based methods using the latest computer modelling algorithms. -

Established almost 30 years ago, Methods in Microbiology is the most prestigious series devoted to techniques and methodology in the field. Now totally revamped, revitalized, with a new format and expanded scope, Methods in Microbiology will continue to provide you with tried and tested, cutting-edge protocols to directly benefit your research. Focuses on the methods most useful for the microbiologist interested in the way in which bacteria cause disease Includes section devoted to 'Approaches to characterising pathogenic mechanisms' by Stanley Falkow Covers safety aspects, detection, identification and speciation Includes techniques for the study of host interactions and reactions in animals and plants Describes biochemical and molecular genetic approaches Essential methods for gene expression and analysis Covers strategies and problems for disease control

Modern biology is rapidly becoming a study of large sets of data. Understanding these data sets is a major challenge for most life sciences, including the medical, environmental, and bioprocess fields. Computational biology approaches are essential for leveraging this ongoing revolution in omics data. A primary goal of this Special Issue, entitled “Methods in Computational Biology”, is the communication of computational biology methods, which can extract biological design principles from complex data sets, described in enough detail to permit the reproduction of the results. This issue integrates interdisciplinary researchers such as biologists, computer scientists, engineers, and mathematicians to advance biological systems analysis. The Special Issue contains the following sections: • Reviews of Computational Methods • Computational Analysis of Biological Dynamics: From Molecular to Cellular to Tissue/Consortia Levels • The Interface of Biotic and Abiotic Processes • Processing of Large Data Sets for Enhanced Analysis • Parameter Optimization and Measurement

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Integrates the latest advances in polysaccharide chemistry and structure analysis, with the practical applications of polysaccharides in medicine and pharmacy, highlighting the role of glycoconjugates in basic biological processes and immunology. It also presents recent developments in glycobiology and glycopathology. The work covers bacterial, fungal and cell-wall polysaccharides, microbial and bacterial exopolysaccharides, industrial gums, the biosynthesis of bacterial polysaccharides, and the production of microbial polysaccharides.

This book is an updated and expanded edition of Carbohydrate Analysis, High Performance Liquid Chromatography and Capillary Electrophoresis and is concerned with the analysis of carbohydrates by modern chromatography and electrophoresis including analytical and preparative high performance liquid chromatography (HPLC), thin layer chromatography (TLC), field flow fractionation (FFF), capillary electrophoresis (CE), capillary electrochromatography (CEC), polyacrylamide gel electrophoresis (PAGE), gas chromatography (GC) and supercritical fluid chromatography (SFC). Thirty-one chapters cover: various modes of HPLC, CE, CEC, FFF, GC and SFC that are currently applied to the analysis of carbohydrates; discussions on analytical and preparative separations; descriptions of the principles of detection and quantitative determination of carbohydrates by the various separation techniques; reviews of sample preparations; and information on important applications. Furthermore, the book describes in detail the different direct and indirect detection methods that have been introduced for the sensitive detection of carbohydrates. This title is useful for a wide audience including separation scientists; analytical chemists and biochemists; carbohydrate chemists; glycoprotein and glycolipid chemists; molecular biologists; and biotechnologists. The book is also a useful reference for both the experienced analyst and the newcomer and for users of modern chromatography and electrophoresis. · Contains 31 chapters covering all aspects of carbohydrate analysis by modern chromatography and electrophoresis · Each chapter discusses the basic principles, advantages and limitations, and applications of the particular detection technique · Useful reference for both the experienced analyst and the newcomer

The most comprehensive textbook/reference ever to cover the chemical basis of life, the "Green Bible of Biochemistry" has been a well-respected contribution to the field for more than twenty years. The complex structures that make up cells are described in detail, along with the forces that hold them together, and the chemical reactions that allow for recognition, signaling and movement. There is ample information on the human body, its genome, and the action of muscles, eyes, and the brain. The complete set deals with the natural world, treating the metabolism of bacteria, toxins, antibiotics, specialized compounds made by plants, photosynthesis, luminescence of fireflies, among many other topics. * The most comprehensive biochemistry text reference available on the market * Organized into two volumes, comprising 32 chapters and containing the latest research in the field * Biological content is emphasized: for example, macromolecular structures and enzyme action are discussed

"Presents state-of-the-art methods for the synthesis, analysis, and conformational investigation of glycoproteins and glycopeptides. Discusses the history of glycopeptide synthesis, therapeutic applications, and the future of research."

Carbohydrates and glycoconjugates play an important role in several life processes. The wide variety of carbohydrate species and their inherent polydispersity and heterogeneity require separation techniques of high resolving power and high selectivity such as high performance liquid chromatography (HPLC) and capillary electrophoresis (HPCE). In the last decade HPLC, and recently HPCE methods have been developed for the high resolution and reproducible quantitation of carbohydrates. Despite the importance of these two column separation technologies in the area of carbohydrates, no previous book describes specialized methods for the separation, purification and detection of carbohydrates and glycoconjugates by HPLC and HPCE. Therefore, the objective of the present book is to provide a comprehensive review of carbohydrate analysis by HPLC and HPCE by covering analytical and preparative separation techniques for all classes of carbohydrates including mono- and disaccharides; linear and cyclic oligosaccharides; branched heterooligosaccharides (e.g., glycans, plant-derived oligosaccharides); glycoconjugates (e.g., glycolipids, glycoproteins); carbohydrates in food and beverage; compositional carbohydrates of polysaccharides; carbohydrates in biomass degradation; etc. The book will be of interest to a wide audience, including analytical chemists and biochemists, carbohydrate, glycoprotein and glycolipid chemists, molecular biologists, biotechnologists, etc. It will also be a useful reference work for both the experienced analyst and the newcomer as well as for users of HPLC and HPCE, graduates and postdoctoral students.

A comprehensive overview on the advances in the field, this volume presents the science underpinning the probiotic and prebiotic effects, the latest in vivo studies, the technological issues in the development and manufacture of these types of products, and the regulatory issues involved. It will be a useful reference for both scientists and technologists working in academic and governmental institutes, and the industry.

Because new information was discovered at an incredible rate since the publication of the successful first edition of this Handbook, this fully updated second edition covers all areas of interest in the field of capillary electrophoresis (CE). A relatively new technology, CE is a principle method for studying the physicochemical properties of proteins, peptides, and other macromolecules. Where applicable, the 30 chapters provide basic underlying theories as well as application-oriented aspects of each technique.Keep up with all the developments in this growing field with the Handbook of Capillary Electrophoresis, Second Edition - a complete guide to the fundamentals of CE and the latest research. The chapters are organized into five units: Modes: Presents a theoretical development of the basic principles governing separation with several modes, including CEC, and discusses their practical aspects. Analyte: Applies CE to the analysis of a specific class of analytes, including organic and inorganic ions, pharmaceuticals, glycoconjugates, peptides, proteins, and DNA fragments. Fundamental Aspects of CE: Technique-oriented information for the practitioner, including the importance of the sample matrix, on-line preconcentration of samples, modes of detection, and specific aspects of CE data analysis. Applications of CE: Includes single cell analysis, CE in DNA sequencing, CE as a clinical diagnostic tool, identifying and quantifying drugs, and for characterizing interacting species. Specialized Aspects of CE: Discusses interfacing CE with mass spectrometry, high-volume throughput continuous CE, microchip CE, control of EOF, and much more. The Handbook of Capillary Electrophoresis, Second Edition, pulls together diverse areas and applications of CE, resulting in an excellent tool for scientists involved in biotechnology and clinical chemistry, as well as the pharmaceutical, bioscience, chemical, and instrument-manufacturing industries. With an applications-oriented focus, the handbook is also a superb manual for workshops, seminars, and graduate courses in separation science.

Advances in instrumentation and applied instrumental analysis methods have allowed scientists concerned with food and beverage quality, labeling, compliance, and safety to meet ever increasing analytical demands. Texts dealing with instrumental analysis alone are usually organized by the techniques without regard to applications. The biannual review issue of Analytical Chemistry under the topic of Food Analysis is organized by the analyte such as N and protein, carbohydrate, inorganics, enzymes, flavor and odor, color, lipids, and vitamins. Under 'flavor and odor' the subdivisions are not along the lines of the analyte but the matrix (e.g. wine, meat, dairy, fruit) in which the analyte is being determined. In "Instrumentation in Food and Beverage Analysis" the reader is referred to a list of 72 entries entitled "Instrumentation and Instrumental Techniques" among which molecular spectroscopy, chromatographic and other sophisticated separations in addition to hyphenated techniques such as GS-Mass spectrometry. A few of the entries appear under a chapter named for the technique. Most of the analytical techniques used for determination, separations and sample work prior to determination are treated in the context of an analytical method for a specific analyte in a particular food or beverage matrix with which the author has a professional familiarity, dedication, and authority. Since, in food analysis in particular, it is usually the food matrix that presents the research analytical chemist involved with method development the greatest challenge.

The second edition of this highly successful text details the involvement of carbohydrates in biological processes which have greatly fuelled the current interest in this diverse range of molecules. This text presents the up-to-date techniques required to analyse a wide variety of carbohydrates and carbohydrate-containing molecules.

RNA-protein interactions play a fundamental role in gene expression and protein synthesis. Recent research into the role of RNA in cells has elucidated many more vital interactions with proteins. This book provides an up-to-date and comprehensive guide to a wide range of laboratory procedures to investigate the interactions between RNA and proteins. - ;RNA-protein interactions play a vital role in gene transcription and protein expression. Interactions such as the synthesis of mRNA by RNA polymerases, to the essential modification of RNA by the proteins of the spliceosome complex, and the highly catalytic action of the ribosome in protein synthesis, are established as being fundamental to the function of RNA. Recent research into, for example, the role of RNA as a catalyst, has elucidated many more interactions with proteins that are vital to cell function. RNA - Protein Interactions: A Practical Approach provides a clear and comprehensive guide to the experimental procedures used in studying RNA - protein interactions.

The approaches covered range from those initially used to detect a novel RNA-protein interaction, various biochemical and genetic approaches to purifying and cloning RNA binding proteins, through to methods for an in depth analysis of the structural basis of the interaction. The volume includes a number of procedures that have not previously been covered in this type of manual. These include the production of site-specifically modified RNAs by enzymatic and chemical methods and in vivo screening for novel RNA - protein interactions in yeast and E. coli . This is the first volume to gather in one place this wide array of approaches for studying RNA - protein interactions. As is customary for the Practical Approach series, the writing is characterized by a clear explanatory style with many detailed protocols. This informative book will be a valuable aid to laboratory workers in biochemistry and molecular biology - graduate students, postdoctoral and senior scientists - whose research encompasses this field. -

America has no official royalty by design. Yet there have been the Roosevelts, the Adams, the Bushes, the wanabee Clintons and most intriguing of all -- the Kennedys. The Kennedys have so far only reached the presidency once but the assassination of JFK and his brother Robert, and the trials and tribulations of the family members and society in general continue to fascinate the world. This new book presents more than 1200 citations of books and related materials arranged by family member. The accompanying CD-ROM offers ready access and easy searching.

Glycostructures play a highly diverse and crucial role in a myriad of organisms and systems in biology, physiology, medicine, and bioengineering and technology. Only in recent years have the tools been developed to partly understand the highly complex functions and chemistry behind them. In this set the editors present up-to-date information on glycostructures, their chemistry and chemical biology, in the form of a comprehensive survey. The text is accompanied by over 2000 figures, chemical structures and reaction schemes and more than 9000 references. The accompanying CD-ROM enables, besides text searches, searches for structures, schemes, and other information.

Recent Advances in Natural Products Analysis is a thorough guide to the latest analytical methods used for identifying and studying bioactive phytochemicals and other natural products. Chemical compounds, such as flavonoids, alkaloids, carotenoids and saponins are examined, highlighting the many techniques for studying their properties. Each chapter is devoted to a compound category, beginning with the underlying chemical properties of the main components followed by techniques of extraction, purification and fractionation, and then techniques of identification and quantification. Biological activities, possible interactions, levels found in plants, the effects of processing, and current and potential industrial applications are also included. Focuses on the latest analytical techniques used for studying phytochemical and other biological compounds Authored and edited by the top worldwide experts in their field Discusses the current and potential applications and predicts future trends of each compound group

First multi-year cumulation covers six years: 1965-70.

An essential reference for any laboratory working in the analytical fluorescence glucose sensing field. The increasing importance of these techniques is typified in one emerging

area by developing non-invasive and continuous approaches for physiological glucose monitoring. This volume incorporates analytical fluorescence-based glucose sensing reviews, specialized enough to be attractive to professional researchers, yet appealing to a wider audience of scientists in related disciplines of fluorescence.

This book provides information on the techniques needed to analyze foods in laboratory experiments. All topics covered include information on the basic principles, procedures, advantages, limitations, and applications. This book is ideal for undergraduate courses in food analysis and is also an invaluable reference to professionals in the food industry.

General information is provided on regulations, standards, labeling, sampling and data handling as background for chapters on specific methods to determine the chemical composition and characteristics of foods. Large, expanded sections on spectroscopy and chromatography also are included. Other methods and instrumentation such as thermal analysis, ion-selective electrodes, enzymes, and immunoassays are covered from the perspective of their use in the analysis of foods. A website with related teaching materials is accessible to instructors who adopt the textbook.

In this fourth and last volume of the series the presentation of methods and techniques for the analysis of foods, nutrients, antinutritional factors and contaminants in foods, is concisely described and referenced. This book will be a convenient source of information on the chemical analysis of food components for the manufacture, marketing and labelling of food products. It will help facilitate a better understanding for marketing goods globally. Food manufacturers, scientists, and technicians now have a valuable reference on the analytical procedures for foods used in Europe.

Wir sind umgeben von Kohlenhydraten: der süße Kaffee, Tee oder Dessert, die Stärke als Hauptkomponente unserer Nahrung und die Zellulose als Strukturelement in Pflanzen. Kohlenhydrate sind eine wichtige Klasse biologischer Moleküle, die an einer Anzahl wichtiger biochemischer Prozesse beteiligt sind. Gerade beginnen wir die Rolle von komplexen Zuckern zu verstehen, die an Proteine gebunden die Kommunikation von Zellen in einer "Zuckersprache" bewerkstelligen. Und nicht zuletzt kommen die ersten Kohlenhydratmoleküle als Medikamente auf den Markt. Anders als für andere Biopolymere sind die analytischen Methoden zur strukturellen Charakterisierung und Sequenzanalyse für Kohlenhydrate zur Zeit ungenügend, zum Teil wegen der überwältigenden Isotopenzahl der Zucker. Dieses Buch beschreibt die Entwicklung der letzten Jahre, die mit der Kapillarelektrophorese in Bezug auf eine miniaturisierte Analytik mit besserer Auflösung und Empfindlichkeit gemacht wurden. Instrumentierung, Derivatisierung, Trennbedingungen und Anwendungen in verschiedenen Disziplinen und Industrien wie z. B. Glykobiologie, Lebensmittelindustrie und Biotechnologie werden beschrieben.

Dairy foods account for a large portion of the Western diet, but due to the potential diversity of their sources, this food group often poses a challenge for food scientists and their research efforts. Bringing together the foremost minds in dairy research, Handbook of Dairy Foods Analysis compiles the top dairy analysis techniques and methodologies from around the world into one, well-organized volume. Co-Edited by Fidel Toldra - Recipient of the 2010 Distinguished Research Award from the American Meat Science Association Exceptionally comprehensive both in its detailing of methods and the range of products covered, this handbook includes tools for analyzing chemical and biochemical compounds and also bioactive peptides, prebiotics, and probiotics. It describes noninvasive chemical and physical sensors and starter cultures used in quality control. Covers the Gamut of Dairy Analysis Techniques The book discusses current methods for the detection of microorganisms, allergens, and other adulterations, including those of environmental origin or introduced during processing. Other methodologies used to evaluate color, texture, and flavor are also discussed. Written by an International Panel of Distinguished Contributors Under the editorial guidance of renowned authorities, Leo M.L. Nollet and Fidel Toldrá, this handbook is one of the few references that is completely devoted to dairy food analysis – a extremely valuable reference for those in the dairy research, processing, and manufacturing industries.

Emphasizing effective, state-of-the art methodology and written byrecognized experts in the field, the Handbook of Food AnalyticalChemistry is an indispensable reference for food scientists andtechnologists to enable successful analysis. * Provides detailed reports on experimental procedures * Includes sections on background theory and troubleshooting * Emphasizes effective, state-of-the art methodology, written byrecognized experts in the field * Includes detailed instructions with annotated advisory comments,key references with annotation, time considerations and anticipatedresults

Recent advances in the biosciences have led to a range of powerful new technologies, particularly nucleic acid, protein and cell-based methodologies. The most recent insights have come to affect how scientists investigate and define cellular processes at the molecular level. This book expands upon the techniques included in the first edition, providing theory, outlines of practical procedures, and applications for a range of techniques. Written by a well-established panel of research scientists, the book provides an up-to-date collection of methods used regularly in the authors' own research programs.

The series, Methods in Plant Biochemistry, provides an authoritative reference on current techniques in the various fields of plant biochemical research. Each volume in the series will, under the expert guidance of a guest editor, deal with a particular group of plant compounds. Each will describe the historical background and current, most useful methods of analysis. The volumes include detailed discussions of the protocols and suitability of each technique. Case treatments, diagrams, chemical structures, reference data, and properties will be featured along with a full list of references to the specialist literature. Conceived as a practical companion to The Biochemistry of Plants, edited by P.K. Stumpf and E.E. Conn, no plant biochemical laboratory can afford to be without this comprehensive and up-to-date reference source.

Although there is a vast literature covering numerous carbohydrate analytical methods, it is not always obvious to the researcher which method, or even physical technique, is the most appropriate to a particular investigation. Carbohydrate Analysis answers the need for a handbook of laboratory protocols in this field. Chapters are arranged on the basis of carbohydrate moiety to facilitate choice of analysis

for specific applications. The book will also be a useful source of reference in initial approaches to carbohydrate analyses.

Continuing in the tradition of its well-received predecessor, Carbohydrates in Food, Second Edition provides thorough and authoritative coverage of the chemical analysis, structure, functional properties, and nutritional relevance of monosaccharides, disaccharides, and polysaccharides used in food. The book combines the latest data on the analytical, physico-chemical, and nutritional properties of carbohydrates, offering a comprehensive and accessible single source of information. It evaluates the advantages and disadvantages of using various analytical methods, presents discussion of relevant physico-chemical topics that relate to the use of carbohydrates in food that allow familiarity with important functional aspects of carbohydrates; and includes information on relevant nutritional topics in relation to the use of carbohydrates in food. Carbohydrates in Food, Second Edition is an important resource for anyone working with carbohydrates in food because it provides essential information on the chemical analysis and physico-chemical properties of carbohydrates and also illustrates how they can be used in product development to increase the health benefits for the public. This New Edition Includes: Updated information on nutritional aspects of mono- and disaccharides Analytical and functional aspects of gums/hydrocolloids Nutritional aspects of plant cell wall polysaccharides, gums, and hydrocolloids Analytical, physicochemical, and functional aspects of starch Revised and expanded reference lists

Glycoproteins play an important role in the regulation of gene expression, cell growth, migration, differentiation and apoptosis. Over the last decade, research has highlighted the therapeutic implications of glycoproteins for many physiological and pathological processes, such as inflammation, arthritis and metastasis. The first part of the book d

Glycobiology: A Practical Approach describes the essential analytical techniques required to study glycoproteins and will be an important practical guide for all researchers, including those in the pharmaceutical industry, working in this field.

Chemical defence by means of toxins poisonous to other organisms, be they animals or plants, is widespread amongst the plant kingdom - including microorganisms as well. This book embraces the analysis of a wide range of plant toxins and this fills a gap in the plant pathology and ecological biochemistry fields. The topics covered include toxic extracellular enzymes, host selective toxins, elicitors, phototoxins, aflatoxins, mycotoxins, and ecotoxic substance tests by pollen germination and growth. The analytical procedures, which are used to evaluate the toxins, are covered in such a way that the reader is able to carry them out mostly solely by following the detailed descriptions.

The Handbook of Carbohydrate Engineering provides an overview of the basic science, theory, methods, and applications of this broad, interdisciplinary field. The text provides background information along with practical knowledge for current and future research methodologies used in the characterization and synthesis of various carbohydrates. This multidisciplinary perspective involves aspects of basic biology, synthetic chemistry, enzymology, complex instrumentation, and sophisticated modeling. The book presents the fundamentals of carbohydrate engineering, addressing concepts in structure, biosynthesis, and biological functions for a variety of carbohydrates with a particular emphasis on mammalian glycoproteins and their N-linked oligosaccharides, glycolipids, sialic acid, as well as polysaccharides from both eukaryotes and bacteria. It describes glycosylation processes found in nature and surveys methods to manipulate these metabolic systems in living cells both for the improved production of carbohydrates and to give these molecules novel properties. Subsequent sections discuss the various methods of purification, synthesis, modification, and analysis used to create and manipulate carbohydrates in the laboratory; these approaches include chemical-enzymatic synthesis, small-molecule cell-based strategies, as well as complete chemical synthesis. The Handbook of Carbohydrate Engineering also focuses on practical applications for carbohydrates. It emphasizes methods to characterize glycosylation pathways and expounds upon the role of carbohydrates in health and disease, a significant - and rapidly growing - area of research. World-renowned experts discuss biomedical applications, including the development of vaccines, therapeutics, glycomimetics, antibody engineering, drug delivery, tissue engineering and organ regeneration, and diagnostic agents. Several chapters also cover important applications in agriculture, industry, food technology, and environmental remediation.