

# **Microbial Polysaccharides And Polysaccharases**

Sudhir Pratap Singh, Santosh Kumar Upadhyay

#### **Microbial Polysaccharides And Polysaccharases:**

Polysaccharides of Microbial Origin Joaquim Miguel Oliveira, Hajer Radhouani, Rui L. Reis, 2022-03-10 This book provides a comprehensive analysis of microbial polysaccharides their current uses and highlights biomedical opportunities The topics comprise principally a their extraction isolation purification and advanced production processes b characterization of their structural physicochemical and biological properties among others by several techniques c description of the advanced functionalization and modification methods for the polysaccharide based material and d their applications and uses in medical and pharmaceutical fields Each chapter is written by world renowned academics and practitioners on their field This is an essential reference for students in biomedical chemical material and microbiology engineering as well as researchers and professionals in the medical field Microbial Production of Food Ingredients, Enzymes and Nutraceuticals Brian McNeil, David Archer, Ioannis Giavasis, Linda Harvey, 2013-03-21 Bacteria yeast fungi and microalgae can act as producers or catalysts for the production of food ingredients enzymes and nutraceuticals With the current trend towards the use of natural ingredients in foods there is renewed interest in microbial flavours and colours food bioprocessing using enzymes and food biopreservation using bacteriocins Microbial production of substances such as organic acids and hydrocolloids also remains an important and fast changing area of research Microbial production of food ingredients enzymes and nutraceuticals provides a comprehensive overview of microbial production of food ingredients enzymes and nutraceuticals Part one reviews developments in the metabolic engineering of industrial microorganisms and advances in fermentation technology in the production of fungi yeasts enzymes and nutraceuticals Part two discusses the production and application in food processing of substances such as carotenoids flavonoids and terponoids enzymes probiotics and prebiotics bacteriocins microbial polysaccharides polyols and polyunsaturated fatty acids Microbial production of food ingredients enzymes and nutraceuticals is an invaluable guide for professionals in the fermentation industry as well as researchers and practitioners in the areas of biotechnology microbiology chemical engineering and food processing Provides a comprehensive overview of microbial flavours and colours food bioprocessing using enzymes and food biopreservation using bacteriocins Begins with a review of key areas of systems biology and metabolic engineering including methods and developments for filamentous fungi Analyses the use of microorganisms for the production of natural molecules for use in foods including microbial production of food flavours and carotenoids Polysaccharides in Medicinal Applications Severian Dumitriu, 2017-10-19 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 Polysaccharides Inamuddin, Mohd Imran Ahamed, Rajender Boddula, Tariq Altalhi, 2021-05-25

In diesem Werk werden Polysaccharide unter s mtlichen Aspekten betrachtet von den Grundkonzepten bis zur kommerziellen Vermarktung Thema der einzelnen Kapitel sind die verschiedenen Arten von Quellen die Klassifikation Eigenschaften Charakterisierung Verarbeitung Rheologie und Herstellung von Materialien auf Grundlage von Polysacchariden sowie von Polysaccharid Gemischen und Gelen Anwendung finden Polysaccharide u a in der Kosmetik der Lebensmittelwissenschaft der Medikamentenverabreichung der Biomedizin der Biokraftstoffproduktion der Schifffahrt im Verpackungswesen in der Chromatographie und der Umweltsanierung Dar ber hinaus vermittelt das Werk einen berblick ber die Herstellung von anorganischen und Kohlenstoff Nanomaterialien aus Polysacchariden Mit der Betrachtung industrieller Anwendungen schlie t das Buch die L cke zwischen der Forschungsarbeit im Labor und wirtschaftlich nutzbaren Anwendungen in entsprechenden Systems for Drug Delivery Saurabh Bhatia, 2016-10-06 This book details current developments in all natural polymers with a focus on animal and microbial polysaccharides. The book examines compares and contrasts the efficiency of plant and algae based natural polymers in inducing immune reactions Additionally the book details the safety and toxicity profiles with respective regulations Polysaccharides Kishan Gopal Ramawat, Jean-Michel Mérillon, 2015-07-21 This authoritative reference work presents comprehensive information about one of the most important and most wide spread classes of bio organic compounds the polysaccharides The comprehensive and thoroughly up to date handbook presents the sources identification analysis biosynthesis biotechnology and applications of important polysaccharides likes starches cellulose chitin gum and microbial polysaccharides Polysaccharides can exhibit complex structure and various functional activities These bio macromolecules can therefore serve as raw materials for various different materials e g rayon cellulose acetate celluloid and nitrocellulose and they find multiple applications for instance as surgical threads chitin as sources of energy dietary fibers as blood flow adjuvants in cosmetics emulsion stabilizers film formers binders viscosity increasing agents or skin conditioning agenta as food additives in gums chewing gum bases and as vaccines Polysaccharides form the basis for useful products like xanthan gum dextran welan gum gellan gum diutan gum and pullulan Some of the polysaccharide derived products have interesting and useful properties and show biological activities such as immunomodulatory antibacterial anti mutagenic radioprotective anti oxidative anti ulcer antidepressant anti septicaemic or anti inflammatory activities All these applications and properties of polysaccharides are for the first time compiled in a thorough and comprehensive overview in the present work. This reference work is organized thematically in four parts Part I Polysaccharides Occurrence Structure Distribution and Biotechnology Part II Methods Part III Bioactive Polysaccharides Part IV Polysaccharides as Food This reference work is edited by experienced experts all chapters are written by well recognized international specialists It is useful to all those working in the field of botany phytochemistry pharmacy drug delivery molecular biology metabolomics forestry environment conservation biotechnology and NGOs working for forest protection Bacterial Adhesion Dirk Linke, Adrian Goldman, 2011-05-10 Over the last few years

bacterial adhesion has become a more and more important and active scientific area but the field lacks communication and scientific exchange between medical and microbiology researchers who work with the relevant biological systems and biochemists structural biologists and physicists who know and understand the physical methods best suited to investigate the phenomenon at the molecular level The field consequently would benefit from a cross disciplinary conference enabling such communication This book tries to bridge the gap between the disciplines Microbial Exopolysaccharides as Novel and Significant Biomaterials Ashok Kumar Nadda, Sajna K. V., Swati Sharma, 2021-07-08 This book examines the commercial role of various microbial polysaccharides and recent advances in their production Offering an overview of the physiological role biosynthetic pathways and regulatory mechanisms it also explores the current challenges regarding bioprocessing for the production of polysaccharides Glycoscience Bertram O. Fraser-Reid, Kuniaki Tatsuta, Joachim Thiem, 2008-04-14 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

The Complex World of Polysaccharides Desiree Nedra Karunaratne, 2012-10-31 The complex world of polysaccharides is a compilation of the characteristics of a variety of polysaccharides from plants animals and microorganisms The diversity of these polysaccharides arises from the structural variations and the monosaccharide content which is under genetic control The chemical and physical properties have made them useful in many pharmaceutical food and industrial applications These properties of the polysaccharides determine their biological activity and their function in various applications The role played by polysaccharides in preservation and protection of food as carriers of nutrients and drugs their ability to interact with molecules both for efficient delivery as well as improving textures of food colloids and their use as therapeutics are some of Enzymatic Technologies for Marine Polysaccharides Antonio Trincone, 2019-04-08 The bioactivity the functions discussed potential of marine polysaccharides has long been considered an underexploited aspect These molecules found in seaweed microalgae bacteria and animal fish shellfish mollusks etc and the derived oligosaccharides need to be explored thoroughly with an interdisciplinary approach They are an extraordinary source of chemical diversity and the literature highlights many applicative fields including the food industry cosmetics biomedicine agriculture environmental protection wastewater management etc More recently a new challenge has emerged the exploitation of marine biomass as the source of sustainable energy to participate in the future replacement of fossil resources Enzymatic Technologies for Marine Polysaccharides provides insight into the recent research developments of marine polysaccharides and their current and potential

applications The first section of the book explores the diversity of marine polysaccharides from various angles including a description of the chemical complexity and current applications and new perspectives in food pharmaceutical cosmetics and biomaterials offered by recent research Efficient valorization of the marine polysaccharide biomass requires a rigorous analysis of the polysaccharides structure and their biological properties. The second section of the book concerns the development of extraction techniques and the improvement of the methods aimed at the characterization of their structure and function Finally the third and last section of the book articulates the enzymatic technologies from the discovery of novel enzymes to their production pipelines related to the fields of biorefinery food pharmaceutics and other fine chemicals Presents the latest research in marine oligosaccharides and polysaccharides Written by world class researchers in marine enzyme technology Discusses the latest developments in extraction methods Presents a detailed overview of enzymatic routes for modification production and synthesis of marine oligosaccharides Contains extensive references at the end of each chapter to enhance further study Polysaccharides as a Green and Sustainable Resources for Water and Wastewater Treatment Nurudeen A. Oladoja, Emmanuel I. Unuabonah, OMOTAYO S. AMUDA, Olatunji M. Kolawole, 2017-05-22 This brief critically reviews the structure and applications of polysaccharide based materials as a green and sustainable resource in water and water treatment operations. The authors present a fascinating insight into the application of this renewable resource in water and wastewater treatment operations approached from multiple perspectives mechanistic insight into the coagulation efficiency of polysaccharides based coagulants progress and prospects of polysaccharide composites as adsorbent for water and wastewater treatment structural modifications of polysaccharides for enhanced performance as adsorbents tuning polysaccharides framework for optimal coagulation efficiency and tapping into microbial polysaccharides for water and wastewater purifications. This brief is aimed at professionals active in the science and engineering aspects of water and wastewater treatment operations **Polysaccharides** Severian Dumitriu, 1998-05-12 Offers comprehensive coverage of the structural characterization of polysaccharides emphasizing commercially available and potential exopolysaccharides as well as new applications Presents the major chemical and physical properties of polysaccharides and derivatives Food Polysaccharides and Their Applications Alistair M. Stephen, Glyn O. Phillips, 2006-05-26 Comprehensive in scope Food Polysaccharides and Their Applications Second Edition explains the production aspects and the chemical and physical properties of the main classes of polysaccharaides consumed as food highlighting their nutritional value and their technological characteristics Chapters in this new edition detail the source biosynthesis molecular structures and physical properties of polysaccharides They also explore production and uses in food formulations the effects of cooking and interactions with proteins lipids sugars and metal ions analytical methods including identification and quantitative determination and nutritional and ecological considerations with emphasis on genetic engineering of food crops The editors carefully balance coverage of fundamental aspects and practical implications for the

food industry What's New in the Second Edition Explains the preparation of new starch esters and improved techniques for the production of acid converted and oxidized starches Details new information on the natural functions of cell wall polysaccharides of seeds in relation to their molecular structures biosynthesis and enzymatic hydrolysis Presents additional references that include those relating to IR and NMR spectrometric methods of analysis **Microbial Production of Food** Ingredients and Additives Alexandru Mihai Grumezescu, Alina Maria Holban, 2017-08-04 Microbial Production of Food Ingredients and Additives Volume Five the latest release in the Handbook of Food Bioengineering series is a solid resource on how microorganisms can increase food production and quality Microorganisms are used to create and enhance food used as food additives to improve food taste and in improving function and fortification to benefit overall health The book presents the applications of microbial products in food bioengineering and methods to obtain valuable ingredients such as sugars acids secondary metabolites enzymes and vitamins Recent and future applications of these microbial derived food components are discussed along with future applications Provides various research examples on how microbial production can improve food by lactic acid bacteria Presents information on how microorganisms may be utilized to produce high quantity and quality therapeutic food ingredients used for human and animal food Includes numerous applications to provide a broad perspective on the benefits of microbial production and how they are an alternative to chemical production and purification of ingredients Bacterial Capsules Klaus Jann, Barbara Jann, 2012-12-06 Many bacteria such as certain Neisseria and Haemophilus or Escherichia coli are able to withstand the bactericidal activity of complement and phagocytes This bacterial self protection is brought about by encapsulation Bacterial capsules thus enable the pathogenic bacteria to survive in the host by counter action or evasion of the nonspecific host defense in the early pre immune phase of an infection It is only in the late immune phase of the infection when specific anticapsular antibodies are formed and enforce the host s defense system that this protective action is overcome Encapsulated bacteria are then killed and eliminated Interestingly some capsules can not or only inefficiently be handled by the immune system. The ensuing lack of antibody formation results in a prolonged susceptibility of the host to the pathogenic bacteria exhibiting such capsules It was found that bacterial capsules consist of acidic poly saccharides From this it followed that the role of the capsules in the interaction of encapsulated bacteria with the host may be due to the chemistry of the capsular polysaccharides This led to intensive studies of capsular polysaccharides in many laboratories Our increasing knowledge of the structural features of capsular polysaccharides prompted not only immuno chemical studies analyzing the interactions of these poly saccharide antigens and characterizing the epitopes but also investigations into their biosynthesis These studies were complemented and supported by genetic analyses Today many interdisciplinary investigations of capsular polysaccharides are in progress **Functional** Food Carbohydrates Costas G. Biliaderis, Marta S. Izydorczyk, 2006-10-10 Functional Food Carbohydrates presents comprehensive coverage of a broad range of physiologically active carbohydrate compounds and their roles in the promotion

of health and the prevention of disease It provides the most up to date information available on the chemistry physical properties processing effects production and physiological function of these food constituents The volume discusses the specific classes of carbohydrates in foods that seem to exert health enhancing effects based on clinical and or epidemiological studies and reviews the physiological and metabolic roles that different carbohydrates have in disease prevention and management focusing on chronic diseases Polysaccharides Gerald O. Aspinall, 1970 of Microorganism-Based Industrial Molecules Sudhir Pratap Singh, Santosh Kumar Upadhyay, 2021-12-13 Discover a comprehensive and current overview of microbial bioprospecting written by leading voices in the field In Bioprospecting of Microorganism Based Industrial Molecules distinguished researchers and authors Sudhir P Singh and Santosh Kumar Upadhyay deliver global perspectives of bioprospecting of biodiversity The book covers diverse aspects of bioprospecting of microorganisms demonstrating biomass value of nutraceutical pharmaceutical biomedical and bioenergetic importance The authors present an amalgamation of translational research on bioresource utilization and ecological sustainability that will further the reader's knowledge of the applications of different microbial diversity and reveal new avenues of research investigation Readers will also benefit from A thorough introduction to microbial biodiversity and bioprospecting An exploration of anti ageing and skin lightening microbial products and microbial production of anti cancerous biomolecules A treatment of UV protective compounds from algal biodiversity and polysaccharides from marine microalgal sources Discussions of microbial sources of insect toxic proteins and the role of microbes in bio surfactants production Perfect for academics scientists researchers graduate and post graduate students working and studying in the areas of microbiology food biotechnology industrial microbiology plant biotechnology and microbial biotechnology Bioprospecting of Microorganism Based Industrial Molecules is an indispensable guide for anyone looking for a comprehensive overview of the subject Biomaterials David Byrom, 1991-06-18 Biomaterials are produced from biological material and are used for their physical characteristics. This book looks at the range of biomaterials and their applications which range from the use of polysaccharides as thickening agents to the use of proteins as fibres and adhesives

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