

BIOTECHNOLOGY OF MICROBIAL ENZYMES

PRODUCTION, BIOCATALYSIS AND INDUSTRIAL APPLICATIONS

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Microbial Enzymes And Biotechnology

Goutam Brahmachari



Microbial Enzymes And Biotechnology:

Microbial Enzymes and Biotechnology W.M. Fogarty, C.T. Kelly, 2012-12-06 Biotechnology is now one of the major growth areas in science and engineering and within this broad discipline enzyme technology is one of the areas earmarked for special and significant developments This publication is the second edition of Microbial Enzymes and Biotechnology which was originally published in 1983 In this edition the editors have attempted to bring together accounts by the relevant experts of the current status of the major areas of enzyme technology and specifically those areas of actual and or potential commercial importance Although the use of microbial enzymes may not have expanded at quite the rate expected a decade ago there is nevertheless intense activity and considerable interest in the whole area of enzyme technology Microbial enzymes have been used in industry for many centuries although it is only comparatively recently that detailed knowledge relating to their nature properties and function has become more evident Developments in the 1960s gave a major thrust to the use of microbial enzymes in industry The commercial success of alkaline proteases and amyloglucosidases formed a bed rock for subsequent research and development in the area

Microbial Enzyme Technology in Food Applications

Ramesh C. Ray, Cristina M. Rosell, 2017-03-27 The aim of food processing is to produce food that is palatable and tastes good extend its shelf life increase the variety and maintain the nutritional and healthcare quality of food To achieve favorable processing conditions and for the safety of the food to be consumed use of food grade microbial enzymes or microbes being the natural biocatalysts is imperative This book discusses the uses of enzymes in conventional and non conventional food and beverage processing as well as in dairy processing brewing bakery and wine making Apart from conventional uses the development of bioprocessing tools and techniques have significantly expanded the potential for extensive application of enzymes such as in production of bioactive peptides oligosaccharides and lipids flavor and colorants Some of these developments include extended use of the biocatalysts as immobilized encapsulated enzymes microbes both natural and genetically modified as sources for bulk enzymes solid state fermentation technology for enzyme production Extremophiles and marine microorganisms are another source of food grade enzymes The book throws light on potential applications of microbial enzymes to expand the base of food processing industries

Microbial Enzymes and Biotechniques Pratyosh Shukla, 2020-10-09 This book compiles the latest research on the multifarious roles of microbial enzymes and provides an overview of microbial enzymes and biotechnologies It discusses the use of microbial enzymes in innovative areas like nanomedicine and synthetic biotechnology as well as the use of starch digesting enzymes and bioactive proteins as biotherapeutics all of which have applications in modern drug discovery processes The book also examines the concept of microbial biotransformation and protein engineering and covers topics such as the immobilization of therapeutic enzymes bioengineering of enzymes for bioactive compounds the production of hydrolytic and oxidative enzymes from plant raw materials and prebiotics and probiotics Given its multidisciplinary scope this book will appeal to researchers and industry

experts in the fields of microbiology biotechnology and molecular medicine Microbial Enzymes Dinesh Yadav, Pankaj Chowdhary, Gautam Anand, Rajarshi Kumar Gaur, 2025-01-13 Comprehensive discussion of production and purification strategies for microbial enzymes important to various industries from food and beverages to pharmaceuticals Microbial Enzymes provides expert insight into diverse aspects of microbial enzymes highlighting strategies for their production purification and manipulation elucidating eco friendly industrial applications and discussing several production processes such as the production of cellulose and non synthetic indigo dye This book emphasizes recent technological interventions in microbial enzyme technology like metagenomics system biology molecular biology genomics directed evolution and bioinformatics The important microbial enzymes highlighted in this book include xylanases ureases methane monooxygenase polyhydroxyalkanoates pectinases peroxidases L rhamnosidase alkane hydroxylases laccases proteases gallic acid decarboxylase chitinases beta glucosidase lipases inulinases tannase mycozyme ACC deaminase ligninolytic enzymes and many more Novel treatment methods involving strains of microorganisms with desirable properties applicable in the process of bioremediation through mitigating climate concern increasing green production technology improving agriculture productivity and providing a means of earning a livelihood are discussed Readers will also gain state of the art background knowledge on existing technologies and their current challenges and future prospects Contributed to by leading experts in the field and edited by four highly qualified academics Microbial Enzymes explores important topics including Strategies for the discovery and enhancement of enzyme function and potentials of system biology to better understand the kinetics of industrially important enzymes Production and therapeutic applications of monoclonal antibodies in cancer and other diseases and characterization of tannase as a virulence factor Opportunities to produce enzymes through food waste and byproducts and recent developments in computational tools Use of Omics tools in the discovery of fungal enzymes and secondary metabolites Microbial Enzymes is a thorough and highly practical reference on the subject for students scientists biotechnologists microbiologists and policymakers working in environmental microbiology biotechnology and environmental sciences *Microbial Enzymes and Biotransformations* Jose Luis Barredo, 2008-02-05 Leading experts in enzyme manipulation describe in detail their cutting edge techniques for the screening evolution production immobilization and application of enzymes These readily reproducible methods can be used to improve enzyme function by directed evolution to covalently immobilize enzymes to microencapsulate enzymes and cells and to manufacture enzymes for human health nutrition and environmental protection Overview chapters on microorganisms as a source of metabolic and enzymatic diversity and on the fast moving field of enzyme biosensors are presented Microbial Enzymes and Biotransformations offers laboratory and industrial scientists a wealth of proven enzymatic protocols that show clearly how to go from laboratory results to successful industrial applications **Biotechnology of Microbial Enzymes** Goutam Brahmachari, 2023-01-20 Biotechnology of Microbial Enzymes Production Biocatalysis and Industrial Applications Second Edition provides a complete

survey of the latest innovations on microbial enzymes highlighting biotechnological advances in their production and purification along with information on successful applications as biocatalysts in several chemical and industrial processes under mild and green conditions The application of recombinant DNA technology within industrial fermentation and the production of enzymes over the last three decades have produced a host of useful chemical and biochemical substances The power of these technologies results in novel transformations better enzymes a wide variety of applications and the unprecedented development of biocatalysts through the ongoing integration of molecular biology methodology all of which is covered insightfully and in depth within the book This fully revised second edition is updated to address the latest research developments and applications in the field from microbial enzymes recently applied in drug discovery to penicillin biosynthetic enzymes and penicillin acylase xylose reductase and microbial enzymes used in antitubercular drug design Across the chapters the use of microbial enzymes in sustainable development and production processes is fully considered with recent successes and ongoing challenges highlighted Explores advances in microbial enzymes from basic science through application in multiple industry sectors Includes up to date discussions of metabolic pathway engineering metagenomic screening microbial genomes extremophiles rational design directed evolution and more Provides a holistic approach to the research of microbial enzymes and their use in sustainable processes and innovation Features all new chapters discussing microbial enzyme classes of growing interest as well as enzymes recently applied in drug discovery and other applications

Microbial Enzymes: Roles and Applications in Industries Naveen Kumar Arora, Jitendra Mishra, Vaibhav Mishra, 2020-04-28 Microbial Enzymes Roles and applications in industry offers an essential update on the field of microbial biotechnology and presents the latest information on a range of microbial enzymes such as fructosyltransferase laccases amylases lipase and cholesterol oxidase as well as their potential applications in various industries Production and optimisation technologies for several industrially relevant microbial enzymes are also addressed In recent years genetic engineering has opened up new possibilities for redesigning microbial enzymes that are useful in multiple industries an aspect that the book explores In addition it demonstrates how some of the emerging issues in the fields of agriculture environment and human health can be resolved with the aid of green technologies based on microbial enzymes The topics covered here will not only provide a better understanding of the commercial applications of microbial enzymes but also outline futuristic approaches to use microbial enzymes as driver of industrial sustainability Lastly the book is intended to provide readers with an overview of recent applications of microbial enzymes in various industrial sectors and to pique researchers interest in the development of novel microbial enzyme technologies to meet the changing needs of industry

Biotechnology of Microbial Enzymes Hazel Nygel, 2019-06-27 Enzymes are biological catalysts which help in accelerating chemical reactions in the cells and thereby helps in sustaining life Microorganisms are a primary source for deriving enzymes Bacteria fungi and yeast are some of the commonly used microorganisms used to extract enzymes for diverse industries such

as pharmaceuticals food textiles animal feed etc Microbes can be genetically modified which makes them a better source of enzymes Such selected concepts that redefine this field of study have been presented in this book The various advancements in microbial enzymes are glanced at and their applications as well as ramifications are looked at in detail For all readers who are interested in this field the case studies included in this book will serve as an excellent guide to develop a comprehensive understanding *Microbial Enzymes as Potential Biotherapeutics in Human Healthcare* Dileep Francis, Sabu

Abdulhameed, Jayachandran K, 2025-08-04 This book comprehensively reviews the diverse potential of microbial enzymes with therapeutic applications covering their production purification and utilization It examines their roles in combating various diseases including inflammation bacterial infections cardiovascular conditions and thrombotic disorders The book highlights their pharmaceutical applications in drug formulation and bioactive compound production with the aim of enhancing drug bioavailability stability and efficacy Furthermore the book explores the potential of microbial fibrinolytic enzymes to revolutionize treatments for thrombotic disorders It also outlines the applications of microbial enzymes in targeting cancer cells emphasizing their pivotal role in innovative treatment modalities Additionally the book presents the therapeutic applications of microbial lipases from their use in lipid lowering medications to the creation of lipase based pharmaceuticals The chapters discuss the potential of microbial uricases in managing uric acid related disorders and the contribution of microbial enzymes in enhancing digestion and alleviating digestive disorders Finally the book delves into the vital role of regulatory authorities and intellectual property rights IPR in the commercialization of therapeutic microbial enzymes As such this book serves as a valuable resource for researchers professionals and students of microbiology biotechnology and pharmaceutical sciences **Key Features** Reviews the therapeutic potential of microbial enzymes and their production and purification Examines the roles of microbial enzymes in combating a wide range of diseases including inflammation bacterial infections cardiovascular conditions and thrombotic disorders Highlights the pharmaceutical applications of microbial enzymes focusing on drug formulation and the production of bioactive compounds to enhance drug bioavailability stability and efficacy Explores the therapeutic applications of microbial lipases from lipid lowering medications to the creation of lipase based pharmaceuticals Presents the vital role of regulatory authorities and intellectual property rights IPR in the commercialization of therapeutic microbial enzymes Biotechnology of Microbial Enzymes Vijai Kumar

Gupta, Manimaran Ayyachamy, 2012-08-01 Enzyme technology is a comprehensive and definitive source of information for all those fascinated in this area It provides a complete survey of microbial enzymes currently available in the market as well as their potential applications in several industrial processes This book includes chapters detailing ACC Deaminase Amylase Chitinase Hyaluronidase Laccases Proteases Pectinases and other important enzymes utilized at commercial scale in various industrial sectors The authors have prepared up to date and easy to read book chapters which will accomplish the mandate for a comprehensive survey of enzymes to audiences across disciplines It is particularly very handy to undergraduates and

diplomas pursuing degrees in microbiology biotechnology microbial technology or biochemistry

Embark on a transformative journey with is captivating work, Discover the Magic in **Microbial Enzymes And Biotechnology** . This enlightening ebook, available for download in a convenient PDF format Download in PDF: , invites you to explore a world of boundless knowledge. Unleash your intellectual curiosity and discover the power of words as you dive into this riveting creation. Download now and elevate your reading experience to new heights .

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