

Antibacterial Activity And Increased Freeze Drying

Nano- and Microscale Drug Delivery Systems: Design and Fabrication presents the developments that have taken place in recent years in the field of micro- and nanoscale drug delivery systems. Particular attention is assigned to the fabrication and design of drug delivery systems in order to i) reduce the side effects of therapeutic agents, ii) increase their pharmacological effect, and iii) improve aqueous solubility and chemical stability of different therapeutic agents. This book is designed to offer a cogent, concise overview of current scholarship in this important area of research through its focus on the characterization and fabrication of a variety of nanomaterials for drug delivery applications. It is an invaluable reference source for both biomaterials scientists and biomedical engineers who want to learn more about how nanomaterials are engineered and used in the design of drug delivery nanosystems. Shows how micro- and nanomaterials can be engineered to create more effective drug delivery systems Summarizes current nanotechnology research in the field of drug delivery systems Explores the pros and cons of using particular nanomaterials as therapeutic agents Serves as a valuable reference for both biomaterials

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Nanotoxicity: Prevention, and Antibacterial Applications of Nanomaterials focuses on the fundamental concepts for cytotoxicity and genotoxicity of nanomaterials. It sheds more light on the underlying phenomena and fundamental mechanisms through which nanomaterials interact with organisms and physiological media. The book provides good guidance for toxic prevention methods and management in the manufacture/application/disposal. The book also discusses the potential applications of nanomaterials-based antibiotics. The potential toxic effects of nanomaterials result not only from the type of base materials, but also from their size/ ligands/surface chemical modifications. This book discusses why different classes of nanomaterials display toxic properties, and what can be done to mitigate this toxicity. It also explores how nanomaterials are being used as antimicrobial agents, being used to purify air and water, and counteract a range of infectious diseases. This is an important reference for materials scientists, environmental scientists and biomedical scientists, who are seeking to gain a greater understanding of how nanomaterials can be used to combat toxic agents, and how the toxicity of nanomaterials themselves can best be mitigated.

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Explains the underlying phenomena and fundamental mechanisms through which nanomaterials interact with organisms and physiological media Outlines major methods for mitigating and prevention of nanotoxicity Discusses the applications of nanomaterials-based antibiotics This book introduces readers to basic studies on and applied techniques involving lactic acid bacteria, including their bioengineering and industrial applications. It summarizes recent biotechnological advances in lactic acid bacteria for food and health, and provides detailed information on the applications of these bacteria in fermented foods. Accordingly, it offers a valuable resource for researchers and graduate students in the fields of food microbiology, bioengineering, fermentation engineering, food science, nutrition and health.

Human Milk: Sampling and Measurement of Energy-Yielding Nutrients and Other Macromolecules presents comprehensive, rigorous, state-of-the-science information on the origins, analysis, concentrations and variation in energy-yielding nutrients and other macromolecules present in human milk. The book includes information on how best to collect and store milk for determining concentrations of these important milk constituents and considers how to conduct milk composition analysis in research, clinical and resource-poor settings. Written by a group of international experts

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who are actively conducting research related to human milk macronutrients, each chapter also provides cutting-edge rationale for what research is still needed in this evolving field. In addition, the book also outlines challenges and opportunities faced by clinicians, industry leaders and regulators interested in adding these components to infant foods, human milk nutrient fortifier and formula. Presents analytical issues and challenges Contains information regarding optimal milk collection and storage procedures for each milk component Uses a systematic treatment of common factors relating to milk composition variation (e.g., time postpartum, maternal diet) Provides a brief summary at the end of each chapter Reviews the literature related to history/discovery, analysis, isoforms, origins/transport, variability, metabolism and research gaps

This book is a printed edition of the Special Issue "Antibacterial Activity of Nanomaterials" that was published in Nanomaterials

Advances in Insect Physiology publishes volumes containing important, comprehensive and in-depth reviews on all aspects of insect physiology. It is an essential reference source for invertebrate physiologists and neurobiologists, entomologists, zoologists and insect biochemists. First published in 1963, the serial is now edited by Steven Simpson and Jerome Casas to provide an international

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perspective. Contributions from the leading researchers in entomology Discusses physiological diversity in insects Includes in-depth reviews with valuable information for a variety of entomology disciplines

A Brief History of Polymeric Cryogels Vladimir I. Lozinsky Basic Principles of Cryotropic Gelation Vladimir I. Lozinsky, Oguz Okay Synthesis, Structure-Property Relationships of Cryogels Oguz Okay, Vladimir I. Lozinsky Kinetic Analysis of Cryotropic Gelation of Poly(vinyl alcohol)/water Solutions by Small-Angle Neutron Scattering Claudio De Rosa, Finizia Auriemma, Rocco Di Girolamo Cryogels via UV Irradiation Technique Petar D. Petrov, Christo B. Tsvetanov Inorganic Cryogels Oleg A. Shlyakhtin Cryogels for Biotechnological Applications Bo Mattiasson Poly(vinyl alcohol) Cryogels for Biomedical Applications Wankei Wan, A. Dawn Bannerman, Lifang Yang, Helium Mak.

The book consists of 21 chapters by subject matter experts and is divided into four parts: Soil Microenvironment and Biotransformation Mechanisms; Synergistic effects between substrates and Microbes; Polyhydroxyalakananoates: Resources, Demands and Sustainability; and Cellulose based biomaterials: Benefits and challenges. Included in the chapters are classical bioremediation approaches and advances in the use of nanoparticles for removal of radioactive waste. The

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book also discusses the production of applied emerging biopolymers using diverse microorganisms. All chapters are supplemented with comprehensive illustrative diagrams and comparative tables.

This book presents the latest advances in marine structures and related biomaterials for applications in both soft- and hard-tissue engineering, as well as controlled drug delivery. It explores marine structures consisting of materials with a wide variety of characteristics that warrant their use as biomaterials. It also underlines the importance of exploiting natural marine resources for the sustainable development of novel biomaterials and discusses the resulting environmental and economic benefits. The book is divided into three major sections: the first covers the clinical application of marine biomaterials for drug delivery in tissue engineering, while the other two examine the clinical significance of marine structures in soft- and hard-tissue engineering, respectively. Focusing on clinically oriented applications, it is a valuable resource for dentists, oral and maxillofacial surgeons, orthopedic surgeons, and students and researchers in the field of tissue engineering. Polysaccharide Carriers for Drug Delivery presents the latest information on the selection of safe materials. Due to reported safety profiles on polysaccharides; they have been the natural choice

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for investigation. A wide variety of drug delivery and biomedical systems have been studied, however, the related information either concept-wise or application-oriented is scattered, therefore becoming difficult for readers and researchers to digest in a concise manner. This gathering of information will help readers easily comprehend the subject matter. Focuses on biopolysaccharide-based, distinct approaches for drug delivery applications Illustrates new concepts and highlights future scope for clinical development Provides comprehensive, up-to-date information on different aspects of drug delivery technology

Probiotics, Prebiotics, and Synbiotics: Bioactive Foods in Health Promotion reviews and presents new hypotheses and conclusions on the effects of different bioactive components of probiotics, prebiotics, and synbiotics to prevent disease and improve the health of various populations. Experts define and support the actions of bacteria; bacteria modified bioflavonoids and prebiotic fibrous materials and vegetable compounds. A major emphasis is placed on the health-promoting activities and bioactive components of probiotic bacteria. Offers a novel focus on synbiotics, carefully designed prebiotics probiotics combinations to help design functional food and nutraceutical products Discusses how prebiotics and probiotics are complementary and can be incorporated into food

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products and used as alternative medicines Defines the variety of applications of probiotics in health and disease resistance and provides key insights into how gut flora are modified by specific food materials Includes valuable information on how prebiotics are important sources of micro-and macronutrients that modify body functions

This work examines meat production, processing and preparation; looks at how freezing affects poultry products; describes changes in seafood and fish during frozen storage; analyses physical and chemical alterations in fruits during freezing; discusses prefreezing operations for vegetables and details the manufacture of ice cream and related products as well as the consequences of freezing eggs and techniques in production of bread from frozen dough. It presents a comprehensive overview of existing knowledge regarding the influence of freezing, frozen storage and thawing of specific food-stuffs. It delineates how freezing processes alter the colour, appearance, palatability, nutritional value, intrinsic chemical reactions, microbiological safety and consumer acceptance of foods. The fundamental concepts upon which food-freezing technologies are based, are reviewed.

Comprehensive Biotechnology, Third Edition unifies, in a single source, a huge amount of information in this growing field. The book covers scientific fundamentals, along with engineering considerations

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and applications in industry, agriculture, medicine, the environment and socio-economics, including the related government regulatory overviews. This new edition builds on the solid basis provided by previous editions, incorporating all recent advances in the field since the second edition was published in 2011. Offers researchers a one-stop shop for information on the subject of biotechnology Provides in-depth treatment of relevant topics from recognized authorities, including the contributions of a Nobel laureate Presents the perspective of researchers in different fields, such as biochemistry, agriculture, engineering, biomedicine and environmental science Probiotic microorganisms are recognised as being beneficial for human health. Prebiotics are substrates that are used preferentially by the probiotic bacteria for their growth. A great deal of interest has been generated in recent years in identifying probiotic bacteria and prebiotics, their characterization, mechanisms of action and their role in the prevention and management of human health disorders. Together they are referred to as synbiotic. This book is in response to the need for more current and global scope of probiotics and prebiotics. It contains chapters written by internationally recognized authors. The book has been planned to meet the needs of the researchers, health professionals, government regulatory agencies and industries. This book will serve as a standard

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reference book in this important and fast-growing area of probiotics and prebiotics in human nutrition and health.

The field of oral microbiology has seen fundamental conceptual changes in recent years. Microbial communities are now seen as the fundamental etiological agent in oral diseases through their interface with host inflammatory responses. Study of structured microbial communities has increased our understanding of the roles of each member in the pathogenesis of oral diseases, principles that apply to both periodontitis and dental caries. Against this backdrop, the third edition of *Oral Microbiology and Immunology* has been substantially expanded and rewritten by an international team of authors and editors. Featured in the current edition are: links between oral infections and systemic disease revised and updated overview of the role of the immune system in oral infections thorough discussions of biofilm development and control more extensive illustrations and Key Points for student understanding Graduate students, researchers, and clinicians as well as students will find this new edition valuable in study and practice. The field of oral microbiology has seen fundamental conceptual changes in recent years. Microbial communities are now seen as the fundamental etiological agent in oral diseases through their interface with host inflammatory responses. Study of structured

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Medicinal herbs are rich in vitamins, minerals and antioxidants, and are able to synthesize secondary metabolites with disease preventive properties. It is due to these qualities that herbs have been used throughout history for flavouring and in food, medicine and perfumery preparations. They are also often considered to be safe alternatives to modern medicines because of their healing properties. Though interest in medicinal and aromatic crops is growing worldwide, there is still little focus on the area of leafy medicinal herbs. This book compiles the literature for 23 globally relevant leafy medicinal herbs. Beginning with a general overview and

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discussion of the importance of these plants, it then handles each herb by chapter. Chapters discuss the botany of the crop, including its history and origin, geographical distribution and morphology, before focusing on the chemical composition and phytochemical attributes. They then review postharvest technology aspects such as processing and value addition, before concluding with the general and pharmacological uses for each crop. A complete compilation of the subject, this book forms a vital resource for researchers, students, farmers and industrialists in the area of leafy medicinal herbs.

This book addresses the use of food hydrocolloids as agents for encapsulating biological active ingredients. It details the challenges of poorly-controlled rate of hydration, thickness, decrease in viscosity upon storage, and susceptibility to microbial contamination. Food Hydrocolloids as Encapsulating Agents in Delivery Systems briefly describes various emerging biomaterials including food gums, starches, beta glucans, and proteins for their potential role as wall material in the development of nutraceutical delivery systems. Further, it describes different techniques of fabrication of nanodelivery systems. Features: Provides an introduction to food hydrocolloids as encapsulating agents Covers starches and their derivatives as delivery systems Includes gum-based delivery systems Discusses the

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classification, isolation, and purification of protein delivery systems This book would be helpful to food scientists and pharmaceutical scientists working in areas including nanotechnology, polymer chemistry, and nutraceutical delivery, as well as regulators and government researchers in US FDA, USDA, and UK FSA regulatory agencies.

Biopolymers have the potential to cut carbon emissions and reduce carbon dioxide in the atmosphere. The carbon dioxide released when they degrade can be reabsorbed by plants, which makes them close to carbon neutral. Biopolymers are biodegradable and some are compostable, too. This book presents key topics on biopolymers, including their synthesis, characterization, and physiochemical properties, and discusses their applications in key areas such as biomedicine, agriculture, and environmental engineering. It will serve as an in-depth reference for the biopolymer industry—material suppliers and processors, producers, and fabricators—and engineers and scientists who are designing biopolymers or evaluating options for switching from traditional plastics to biopolymers. Over the last few decades the prevalence of studies about probiotics strains has dramatically grown in most regions of the world. The use of probiotics strains in animals production may reduce several problems caused by antibiotics therapy, growth promoter and problems from inadequate

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management. Probiotics are specific strains of microorganisms, which when served to human or animals in proper amount, have a beneficial effect, improving health or reducing risk of get sick. This book provides the maximum of information for all that need them trying with this to help many people at worldwide.

Nanotoxicity Prevention and Antibacterial Applications of Nanomaterials Elsevier

Australian Native Plants: Cultivation and Uses in the Health and Food Industries provides a comprehensive overview of native food crops commercially grown in Australia that possess nutritional and health properties largely unknown on a global basis. These native foods have been consumed traditionally, have a unique flavor diversity, offer significant health promoting effects, and contain useful functional properties. Australian native plant foods have also been identified for their promising antioxidant and antimicrobial properties that have considerable commercial potential. This book is divided into three parts: The first part reviews the cultivation and production of many Australian native plants (ANP), including Anise Myrtle, Bush Tomato, Desert Raisin, Davidson's Plum, Desert Limes, Australian Finger Lime, Kakadu Plum, Lemon Aspen, Lemon Myrtle, Muntries, Native Pepper, Quandong, Riberry, and Wattle Seed. It then examines the food and health applications of ANP

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and discusses alternative medicines based on aboriginal traditional knowledge and culture, nutritional characteristics, and bioactive compounds in ANP. In addition, it reviews the anti-obesity and anti-inflammatory properties of ANP and discusses food preservation, antimicrobial activity of ANP, and unique flavors from Australian native plants. The third section covers the commercial applications of ANP. It focuses on native Australian plant extracts and cosmetic applications, processing of native plant foods and ingredients, quality changes during packaging, and storage of Australian native herbs. The final few chapters look into the importance of value chains that connect producers and consumers of native plant foods, new market opportunities for Australian indigenous food plants, and the safety of using native foods as ingredients in the health and food sectors.

Antimicrobial packaging has recently attracted a great deal of interest from the food industry due to the boost in consumer demand for minimally-processed, preservative-free products. Antimicrobial polymeric packaging systems can be considered an emerging technology that could have an important impact on shelf life extension and food safety. Novel polymeric-based packaging materials are continually being developed. This book collects carefully chosen examples of the most recent and relevant advances in the preparation and characterization of antimicrobial composites for food packaging applications. Different polymer nanocomposites with improved packaging properties are discussed along with their mechanisms of action. Further,

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future perspectives for antimicrobial polymeric nanomaterials are provided.

Defensins—Advances in Research and Application: 2013 Edition is a ScholarlyBrief™ that delivers timely, authoritative, comprehensive, and specialized information about alpha-Defensins in a concise format. The editors have built Defensins—Advances in Research and Application: 2013 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about alpha-Defensins in this book to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Defensins—Advances in Research and Application: 2013 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

The need for novel antibiotics is greater now than perhaps anytime since the pre-antibiotic era. Indeed, the recent collapse of many pharmaceutical antibacterial groups, combined with the emergence of hypervirulent and pan-antibiotic-resistant bacteria has severely compromised infection treatment options and led to dramatic increases in the incidence and severity of bacterial infections. This collection of reviews and laboratory protocols gives the reader an introduction to the causes of antibiotic resistance, the bacterial strains that pose the largest danger to humans (i.e., streptococci, pneumococci and enterococci) and the antimicrobial agents used to combat infections with these organisms. Some new avenues that are being investigated for antibiotic development are also discussed. Such

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developments include the discovery of agents that inhibit bacterial RNA degradation, the bacterial ribosome, and structure-based approaches to antibiotic drug discovery. Two laboratory protocols are provided to illustrate different strategies for discovering new antibiotics. One is a bacterial growth inhibition assay to identify inhibitors of bacterial growth that specifically target conditionally essential enzymes in the pathway of interest. The other protocol is used to identify inhibitors of bacterial cell-to-cell signaling. This e-book — a curated collection from eLS, WIREs, and Current Protocols — offers a fantastic introduction to the field of antibiotics and antibiotic resistance for students or interdisciplinary collaborators.

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Breastfeeding and Human Lactation, Fifth Edition continues as the leading reference for the latest clinical techniques and research findings that direct evidence-based clinical practice for lactation consultants and specialists. Thoroughly updated and revised with current research, references, and photos, it

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contains a clear clinical focus with more than 2,000 research studies supporting the clinical recommendations found in the text. Topics include placing breastfeeding in its historical context, workplace-related issues, anatomical and biological imperatives of lactation, the prenatal and perinatal periods and concerns during the postpartum period, the mother's health, and sociocultural issues. With contributions from the foremost experts in the field, *Breastfeeding and Human Lactation, Fifth Edition* is also an excellent resource to prepare for certification and practice as an International Board Certified Lactation Consultant (IBCLC).

The first book dedicated to the potential applications and unique properties of bacterial cellulose (BC), this seminal work covers the basic science, technology, and economic impact of this bulk chemical as well as the companies and patents that are driving the field. It reviews the biosynthesis and properties of BC, including genetics and characterization; discusses the advancing technology as it relates to product development, bioreactors, and production; and analyzes the economic impact of BC on a diverse range of industry applications, including materials and biomaterials, biological and polymer sciences, and electromechanical engineering. *Biological Synthesis of Nanoparticles and Their Applications* gives insight into the synthesis of nanoparticles utilizing the natural routes. It demonstrates various strategies for the synthesis of nanoparticles utilizing plants, microscopic organisms like bacteria, fungi, algae and so forth. It orchestrates interdisciplinary hypothesis, ideas, definitions, models and discoveries associated with complex cell of the prokaryotes and eukaryotes. Highlights: Discusses biological approach towards the nanoparticle synthesis Describes the role of nanotechnology in the field of medicine and its medical devices Covers application and usage of the chemicals at the molecular level to act as catalysts and binding products for

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both organic and inorganic Chemical Reactions Reviews application in physics such as solar cells, photovoltaics and other usage Microorganisms can aggregate and detoxify substantial metals because of different reductase enzymes, which can diminish metal salts to metal nanoparticles. The readers after going through this book will have detailed account of mechanism of bio-synthesis of nanoparticles. This study focuses on the functionality of fermented taro as an antibacterial ingredient for intermediate moisture (IM) products being developed by the military. The taro is cooked and then inoculated with a food-grade bacterium, *Lactococcus lactis* ssp. *lactis*, which produces a bacteriocin, nisin, forming a fermented taro product. The fermented taro has antibacterial activity against various bacteria and is freeze-dried for eventual incorporation as a food preservative ingredient in an IM product. *L. lactis* yielded nisin concentrations in a range of 15,000-19,000 AU/g of taro. Challenge studies were conducted in which the fermented taro was incorporated into an IM product, the burrito sandwich. The challenge organisms consisted of three strains of *Staphylococcus aureus*. The burrito samples with 600 AU/g of fermented taro showed no increase in bacterial counts after 7 days. However, after 14 days the bacterial counts increased to 3×10^7 CFU/g. The burrito samples treated with 1200 AU/g of fermented taro showed no increase in growth from the original inoculum (2×10^5 CFU/g) during the challenge study. The last sampling time was at 56 days with a slight decrease in the *S. aureus* counts. It appears that fermented taro can be a good food preservation ingredient in IM products, though further studies will have to be done to optimize product.

This book explores in depth the latest enabling technologies for regenerative medicine. The opening

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section examines advances in 3D bioprinting and the fabrication of electrospun and electrosprayed scaffolds. The potential applications of intelligent nanocomposites are then considered, covering, for example, graphene-based nanocomposites, intrinsically conductive polymer nanocomposites, and smart diagnostic contact lens systems. The third section is devoted to various drug delivery systems and strategies for regenerative medicine. Finally, a wide range of future enabling technologies are discussed. Examples include temperature-responsive cell culture surfaces, nanopatterned scaffolds for neural tissue engineering, and process system engineering methodologies for application in tissue development. This is one of two books to be based on contributions from leading experts that were delivered at the 2018 Asia University Symposium on Biomedical Engineering in Seoul, Korea – the companion book examines in depth novel biomaterials for regenerative medicine. In all different areas in biomedical engineering, the ultimate objectives in research and education are to improve the quality life, reduce the impact of disease on the everyday life of individuals, and provide an appropriate infrastructure to promote and enhance the interaction of biomedical engineering researchers. This book is prepared in two volumes to introduce recent advances in different areas of biomedical engineering such as biomaterials, cellular

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engineering, biomedical devices, nanotechnology, and biomechanics. It is hoped that both of the volumes will bring more awareness about the biomedical engineering field and help in completing or establishing new research areas in biomedical engineering.

Most composites, particularly those made using thermoset resins, cannot be recycled or reused. As a result, most of them end up in landfills at the end of their useful life which is neither sustainable nor environment-friendly. Various laws enacted by Governments around the world and heightened global awareness about sustainability and global warming is changing this situation. Significant research is being conducted in developing and utilizing sustainable fibers and resins, mostly derived from plant, to fabricate 'Green' composites. The significant progress in the past 20 or so years in this field has led to the development of green composites with high strength or so called Advanced Green Composites. More interestingly, green composites have also acquired various different properties such as fire resistance, transparency, barrier to gases and others. The term 'advanced' which only included high strength and stiffness now includes all these special properties. The world is on the cusp of a major change, and once fully developed, such composites could be used in applications ranging from automobiles to sporting goods, from circuit

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boards to housing and from furniture to packaging. This book, by presenting the state-of-the-art developments in many aspects of advanced green composites adds significantly to the knowledge base that is critical for their success of expanding their use in applications never seen before. The chapters are written by world's leading researchers and present in-depth information in a simple way. This provides readers and researchers the latest developments in the field of 'Green' resins (with ways of strengthening them), High Strength Green Fibers (including micro and nano-cellulose fibrils/fibers) and Green Composites in the first few chapters. The introductory chapter summarizes the consequences of using conventional, petroleum-based materials and the need for green composites as well as the progress being made in this field. After that the book delves in to Advanced Green Composites in a broader sense and includes chapters on High Strength Green Composites, Self-healing Green Composites, Transparent Green Composites, All-cellulose composites, Toughened Green Composites, Green Biofoams, Bioinspired Shape Memory Composites, etc. The chapters are written by the experts who are highly respected in their fields.

Handbook of Antimicrobial Coatings is the first comprehensive work on the developments being made in the emerging field of antimicrobial coatings.

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Crucial aspects associated with coating research are presented in the form of individual chapters.

Particular close attention has been given to essential aspects necessary to understand the properties of novel materials. The book introduces the reader to progress being made in the field, followed by an outline of applications in different areas. Various methods and techniques of synthesis and characterization are detailed as individual chapters. Chapters provide insight into the ongoing research, current trends and technical challenges in this rapidly progressing field. The covered topics were chosen so that they can be easily understood by new scholars as well as advanced learners. No book has been written on this topic thus far with so much crucial information for materials scientists, engineers and technologists. Offers the first comprehensive work on developments being made in the emerging field of antimicrobial coatings Features updates written by leading experts in the field of antimicrobial coatings Includes discussions of coatings for novel materials Provides various methods and techniques of synthesis and characterization detailed in individual chapters

Wine grape pomace (WGP), the byproduct from winemaking, is a good source of polyphenols and dietary fibers, and may be utilized as antioxidant dietary fibers (ADF) for food applications. The objectives of this thesis research were to first

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determine the phenolic compounds, antioxidant and antimicrobial activities in red WGP under different drying processes for long-term storage, and to further evaluate the feasibility of using WGP as a functional food ingredient in yogurt and salad dressing for enhancing the nutritional value and improving storability of the products. Two types of WGP samples, pomace containing seeds and skins (P) and pomace with skins only (S) from Pinot Noir (PN) and Merlot (M) were studied. Samples were subjected to four different drying conditions: 40 °C conventional and vacuum oven, 25 °C ambient air and freeze dry. Total phenolic content (TPC, by Folin-Ciocalteu assay), anthocyanins (ACY, by pH differential method) and flavanols content (TFC, by vanillin assay) of the samples along with their antioxidant activity (DPPH radical scavenge method, RSA) and antibacterial activity (minimum inhibition concentration, MIC) were determined during 16 weeks of storage under vacuum condition at 15±2 °C. Meanwhile, dietary fiber profile was evaluated by using gravimetric-enzyme method. Results showed that dietary fiber contents of PN-P, PN-S, M-P and M-S were 57-63% d.m. with the majority of insoluble fraction. Freeze dried WGP retained the highest bioactive compounds with TPC 21.19-67.74 mg GAE/g d.m., ACY of 0.35-0.76 mg Mal-3-glu/g d.m., TFC of 30.16-106.61 mg CE/g d.m. and RSA of 22.01-37.46 mg AAE/g d.m., followed with ambient

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air dried samples. Overall, TPC, TFC and RSA were higher in PN than in M, and higher in pomace than in skins, while reverse results were observed in ACY. All samples lost significant amount of bioactive compounds during storage, in which ambient air and freeze dried samples had TPC reduction of 32-56% and 35-58%, respectively at the end of 16 weeks of storage. RSA in PN-P and M-P remained more than 50 mg TE/g d.m., meaning WGP still met the criteria of ADF definition after 16 weeks of storage. WGP extracts showed higher antibacterial efficiency against *L. innocua* than that of *E. coli* with MIC of 2, 7, 3 and 8% against *L. innocua*, and 3, 6, 4 and 9% against *E. coli* for PN-P, PN-S, M-P and M-S samples, respectively. This study demonstrated that Pinot Noir and Merlot pomace are good sources of ADF even after 16 weeks of storage at 15 °C and vacuum condition. Due to the highest antioxidant activity (RSA 37.46 mg AAE/g) and dietary fiber content (61%), PN-P was selected as ADF to be fortified in yogurt and salad dressing. Three types of WGP: whole powder (WP), liquid extract (LE) and freeze dried extract (FDE) with different concentrations were incorporated into yogurt (Y), Italian (I) and Thousand Island (T) salad dressings. TPC, RSA and dietary fiber content, major quality attributes including pH and peroxide value (PV) during the shelf life and consumer acceptance of fortified products were evaluated. The highest ADF

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were obtained in 3% WP-Y, 1% WP-I and 2% WP-T samples with the dietary fiber contents of 1.98%, 2.12% and 1.83% and RSA of 935.78, 585.60 and 706.67 mg AAE/kg, respectively. WP fortified products had more dietary fiber content than that of LE and FDE fortified ones because of the insoluble fractions. The pH dropped from 4.52 to 4.32 for 3% WP-Y during three weeks of storage at 4 °C, but remained stable in WGP-I and WGP-T samples after four weeks of storage at 4 °C. Adding WGP resulted in 35-65% reduction of PV in all samples compared to the control. In WGP-Y, the viscosity increased, but syneresis and lactic acid percentage were stable during storage. The 1%WP-Y, 0.5%WP-I and 1%WP-T samples were mostly liked by consumers. Study demonstrated that WGP can be used as a functional food ingredient for enhancing nutraceutical content and extending shelf-life of the food products. This study provided important information about the economically feasible drying methods for retaining the bioactive compounds in WGP during processing and storage and also suggested that WGP can be utilized as antioxidant dietary fiber to be fortified in consumer products to promote nutritional benefit and extend product shelf-life.

The Handbook of Chitin and Chitosan: Composites and Nanocomposites from Chitin and Chitosan, Manufacturing and Characterisations, Volume Two, is a must-read for polymer chemists, physicists and

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engineers interested in the development of ecofriendly micro and nanostructured functional materials based on chitin and their various applications. The book addresses their isolation, preparation and properties, through composites, nanomaterials, manufacturing and characterizations. This is the second of three volumes in a series that contains the latest on the major applications of chitin and chitosan based IPN's, blends, gels, composites and nanocomposites, including environmental remediation, biomedical applications and smart material applications. Provides a comprehensive overview of Chitin and Chitosan materials, from their synthesis and nanomaterials, to their manufacture and applications Volume Two focuses on Chitin and Chitosan composites Includes contributions from leading researchers across the globe and from industry, academia, government and private research institutions Highlights current status and future opportunities

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