

Nanoemulsion A Method To Improve The Solubility Of

Nanobiotechnology Applications in Plant Protection: Volume 2 continues the important and timely discussion of nanotechnology applications in plant protection and pathology, filling a gap in the literature for nano applications in crop protection. Nanobiopesticides and nanobioformulations are examined in detail and presented as powerful alternatives for eco-friendly management of plant pathogens and nematodes. Leading scholars discuss the applications of nanobiomaterials as antimicrobials, plant growth enhancers and plant nutrition management, as well as nanodiagnostic tools in phytopathology and magnetic and supramagnetic nanostructure applications for plant protection. This second volume includes exciting new content on the roles of biologically synthesized nanoparticles in seed germination and zinc-based nanostructures in protecting against toxigenic fungi. Also included is new research in phytotoxicity, nano-scale fertilizers and nanomaterial applications in nematology and discussions on Botrytis grey mold and nanobiocontrol. This book also explores the potential effects on the environment, ecosystems and consumers and addresses the implications of intellectual property for nanobiopesticides. Further discussed are nanotoxicity effects on the plant ecosystem and nano-applications for the detection, degradation and removal of pesticides.

Nanotechnology progresses its concerts and suitability by improving its effectiveness, security and also reducing the impact and risk. Various chapters in this book are written by eminent scientists and prominent researchers in the field of nanotechnology across the world. This book is focused to put emerging techniques forward using nanoparticles for safe and nutritional food production, protecting crops from pests, increasing nutritional value and providing solutions for various environmental issues. The outcome of this book creates a path for wide usage of nanoparticles in food, agriculture and the environment fields. This book has clear and simple illustrations, tables and case studies to understand the content even by non-experts. This book especially deals with the nanotechnology for controlling plant pathogens, food packaging and preservation, agricultural productivity, waste water treatment and bioenergy production. Hence, this book can be adopted and used by many researchers and academicians in the fields of food, agriculture, environment and nanotechnology for catering the needs of sustainable future. The salient features of this book are • Describes nanotechnology as an interdisciplinary and emerging field in life sciences • Useful for researchers in the cutting edge life science related fields of nanoscience, nanobiology and nanotechnology • Deal with various problems in food, agriculture and environmental sector for sustainable solutions through the application of nanotechnology • Supported with illustrations in color, tables and case studies (wherever applicable), and • Contributed and well written by nanotechnology experts from across various disciplines

Nanotechnology has developed remarkably in recent years and, applied in the food industry, has allowed new industrial advances, the improvement of conventional technologies, and the commercialization of products with new features and functionalities. This progress offers the potential to increase productivity for producers, food security for consumers and economic growth for industries. Food Applications of Nanotechnology presents the main advances of nanotechnology for food industry development. The fundamental concepts of the technique are presented, followed by examples of application in several sectors, such as the enhancement of flavor, color

and sensory characteristics; the description of the general concepts of nano-supplements, antimicrobial nanoparticles and other active compounds into food; and developments in the field of packaging, among others. In addition, this work updates readers on the industrial development and the main regulatory aspects for the safety and commercialization of nanofoods. Features: Provides a general overview of nanotechnology in the food industry Discusses the current status of the production and use of nanomaterials as food additives Covers the technological developments in the areas of flavor, color and sensory characteristics of food and food additives Reviews nanosupplements and how they provide improvements in nutritional functionality Explains the antibacterial properties of nanoparticles for food applications This book will serve food scientists and technologists, food engineers, chemists and innovators working in food or ingredient research and new product development. Gustavo Molina is associate professor at the UFVJM (Diamantina—Brazil) in Food Engineering and head of the Laboratory of Food Biotechnology and conducts scientific and technical research. His research interests are focused on industrial biotechnology. Dr. Inamuddin is currently working as assistant professor in the chemistry department of Faculty of Science, King Abdulaziz University, Jeddah, Saudi Arabia. He is also a permanent faculty member (assistant professor) at the Department of Applied Chemistry, Aligarh Muslim University, Aligarh, India. He has extensive research experience in multidisciplinary fields of analytical chemistry, materials chemistry, and electrochemistry and, more specifically, renewable energy and environment. Prof. Abdullah M. Asiri is professor of organic photochemistry and has been the head of the chemistry department at King Abdulaziz University since October 2009, as well as the director of the Center of Excellence for Advanced Materials Research (CEAMR) since 2010. His research interest covers color chemistry, synthesis of novel photochromic and thermochromic systems, synthesis of novel coloring matters and dyeing of textiles, materials chemistry, nanochemistry and nanotechnology, polymers, and plastics. Franciele Maria Pelissari graduated in Food Engineering; earned her master's degree (2009) at the University of Londrina (UEL), Londrina, Brazil; and her PhD (2013) at the University of Campinas (Unicamp), Campinas, Brazil. Since 2013, she has been associate professor at the Institute of Science and Technology program at the Federal University of Jequitinhonha and Mucuri (UFVJM), Diamantina, Brazil, in Food Engineering, and also full professor in the graduate program in Food Science and Technology.

Emulsions, the third volume of the Nanotechnology in the Food Industry series, is an invaluable resource for anyone in the food industry who needs the most recent information about scientific advances in nanotechnology on this topic. This volume focuses on basic and advanced knowledge about nanoemulsion, and presents an overview of the production methods, materials (solvents, emulsifiers, and functional ingredients), and current analytical techniques that can be used for the identification and characterization of nanoemulsions. The book also discusses the applications of nanoemulsion with special emphasis on systems suitable for utilization within the food industry. This book is useful to a wide audience of food science research professionals and students who are doing research in this field, as well as others interested in recent nanotechnological progress worldwide. Presents fundamentals of nanoemulsions, methods of preparation (high-energy and low-energy techniques), and applications in

the food industry Includes research studies of nanoemulsification technology to improve bioavailability of food ingredients and research analysis Offers benefits and methods of risk assessment to ensure food safety Presents cutting-edge encapsulating systems to improve the quality of functional compounds Provides a variety of methods, such as high-shear stirring, high-pressure homogenizers, self-emulsification, phase transitions and phase-inversion, to further research in this field

This Handbook focuses on the recent advancements in Safety, Risk, Ethical Society and Legal Implications (ESLI) as well as its commercialization of nanotechnology, such as manufacturing. Nano is moving out of its relaxation phase of scientific route, and as new products go to market, organizations all over the world, as well as the general public, are discussing the environmental and health issues associated with nanotechnology. Nongovernmental science organizations have long since reacted; however, now the social sciences have begun to study the cultural portent of nanotechnology. Societal concerns and their newly constructed concepts, show nanoscience interconnected with the economy, ecology, health, and governance. This handbook addresses these new challenges and is divided into 7 sections:

Nanomaterials and the Environment; Life Cycle Environmental Implications of Nanomanufacturing; Bioavailability and Toxicity of Manufactured Nanoparticles in Terrestrial Environments; Occupational Health Hazards of Nanoparticles; Ethical Issues in Nanotechnology; Commercialization of Nanotechnology; Legalization of Nanotechnology.

A comprehensive text that offers a review of the delivery of food active compounds through emulsion-based systems Emulsion-based Systems for Delivery of Food Active Compounds is a comprehensive recourse that reviews the principles of emulsion-based systems formation, examines their characterization and explores their effective application as carriers for delivery of food active ingredients. The text also includes information on emulsion-based systems in regards to digestibility and health and safety challenges for use in food systems. Each chapter reviews specific emulsion-based systems (Pickering, multiple, multilayered, solid lipid nanoparticles, nanostructured lipid carriers and more) and explains their application for delivery of food active compounds used in food systems. In addition, the authors – noted experts in the field – review the biological fate, bioavailability and the health and safety challenges of using emulsion-based systems as carriers for delivery of food active compounds in food systems. This important resource: Offers a comprehensive text that includes detailed coverage of emulsion-based systems for the delivery of food active compounds Presents the most recent development in emulsion-based systems that are among the most widely-used delivery systems developed to control the release of food active compounds Includes a guide for industrial applications for example food and drug delivery is a key concern for the food and pharmaceutical industries Emulsion-based Systems for Delivery of Food Active Compounds is designed for food scientists as well as those working in the food, nutraceutical and pharmaceutical and beverage industries. The text offers a comprehensive review of the essential elements of emulsion-based systems for delivery of food active compounds.

This consolidated reference book addresses the various aspects of nano biomaterials used in ophthalmic drug delivery, including their characterization, interactions with ophthalmic system and applications in treatments of the ophthalmic diseases and

disorders. In the last decade, a significant growth in polymer sciences, nanotechnology and biotechnology has resulted in the development of new nano- and bioengineered nano-bio-materials. These are extensively explored as drug delivery carriers as well as for implantable devices and scaffolds. At the interface between nanomaterials and biological systems, the organic and synthetic worlds merge into a new science concerned with the safe use of nanotechnology and nano material design for biological applications. For this field to evolve, there is a need to understand the dynamic forces and molecular components that shape these interactions. While it is impossible to describe with certainty all the bio physicochemical interactions at play at the interface, we are at a point where the pockets of assembled knowledge are providing a conceptual framework to guide this exploration, and review the impact on future product development. The book is intended as a valuable resource for academics and pharmaceutical scientists working in the field of polymers, polymers materials for drug delivery, drug delivery systems and ophthalmic drug delivery systems, in addition to medical and health care professionals in these areas.

This book presents an exhaustive analysis of the trends in the development and use of natural and synthetic polymer systems aimed at sustainable agricultural production. The polymers have allowed the development of controlled and released systems of agrochemicals such as pesticides, fertilizers and phytohormones through micro and nanoencapsulated systems, which protect and stimulate the growth of crops at low costs and without damage to the environment. Hydrogel systems from natural and synthetic polymers have also had their place in the agricultural industry, since they allow to maintain the humidity conditions of the crops for their correct development in drought times. Mulch films made of polymers have also become important in the control of weeds and pests in crops, as well as the use of edible coatings applied to fruits and vegetables during post-harvest, which reduce the losses of these perishable foods. Currently, the systems indicated, as well as others, are already used on a large scale. However, research studies in this area have been limited compared to other polymer applications. This book collects useful information for researchers, students and technologies related to the polymer technology and agri-food production. In this book, world-renowned researchers have participated, including associate editors of important journals, as well as researchers working in the area of research and development (R&D) of leading agri-food industries in the manufacture of agricultural inputs.

Aflatoxins are a group of highly toxic and carcinogenic substances, which occur naturally, and can be found in food substances. Aflatoxins are secondary metabolites of certain strains of the fungi *Aspergillus flavus* and *A. parasiticus* and the less common *A. nomius*. Aflatoxins B1, B2, G1, and G2 are the most important members, which can be categorized into two groups according to the chemical structure. As a result of the adverse health effects of mycotoxins, their levels have been strictly regulated especially in food and feed samples.

Therefore, their accurate identification and determination remain a Herculean task due to their presence in complex food matrices. The great public concern and the strict legislation incited the development of reliable, specific, selective, and sensitive analytical methods for pesticide monitoring that are discussed in this book.

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 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

The book highlights the biotechnological advancement in the area of food adulterants and outlines the current state of art technologies in the detection of food adulterants using omics and nanobiotechnology. The book provides insights to the most recent innovations, trends, concerns, and challenges in food adulterants. It identifies key research topics and practical applications of modern cutting-edge technologies employed for detection of food adulterants including: expansion of food adulterants market, potential toxicity of food adulterants and the prevention of food adulteration act, cutting-edge technology for food adulterants detection, and biosensing and nanobiosensing based detection of food adulterants. There is need for new resources in omics technologies for the application of new nanobiotechnology. Biotechnological Approaches in Food Adulterants provides an overview of the contributions of food safety and the most up-to-date advances in omics and nanobiotechnology approaches to a diverse audience from postgraduate students to researchers in biochemical engineering, biotechnology, food technologist, environmental technologists, and pharmaceutical professionals.

Biologically Active Peptides: From Basic Science to Applications for Human Health stands as a comprehensive resource on bioactive peptide science and applications. With contributions from more than thirty global experts, topics discussed include bioactive peptide science, structure-activity relationships, best practices for their study and production, and their applications. In the interdisciplinary field of bioactive peptides, this book bridges the gap between basic peptide chemistry and human physiology, while reviewing recent advances in peptide analysis and characterization. Methods and technology-driven chapters offer step-by-step guidance in peptide preparation from different source materials, bioactivity assays, analysis and identification of bioactive peptides, encoding bioactive peptides. Later, applications across disease areas and medical specialties are examined in-depth, including the use of bioactive peptides in treating obesity, diabetes, osteoporosis, mental health disorders, food allergies, and joint health, among other disorders, as well as bioactive peptides for sensory enhancement, sports and clinical nutrition, lowering cholesterol, improving cardiovascular health, and driving advances in biotechnology.

Discusses the latest advances in bioactive peptide chemistry, functionality and analysis Offers step-by-step instruction in applying new technologies for peptide extraction, protection, production and encoding, as well as employing bioactive peptide sequencing and bioactivity assays in new research Effectively links basic peptide chemistry, human biology and disease Features chapter contributions from international experts across disciplines and applications

Nanotechnology has gained attention in all aspects of modern science, having vital applications in the food chain, storage, quality monitoring, processing, preservation, and packaging. The global population is increasing rapidly, therefore there is a requirement to produce food products in a more proficient, non-toxic, and sustainable way. Food scientists and microbiologists are interested in food safety and quality assurance to produce excellent-quality food free of food pathogens *Nanotechnological Approaches in Food Microbiology* provides a systematic introduction and comprehensive information about practical approaches and characteristic features related to the significant applications of nanotechnology in food microbiology, including, nano-starch films, nanoemulsions, biogenic nanoparticles, and nanocapsules. The book will explore details about metal nanoparticle synthesis, characterization, mathematical modeling, kinetic studies, and their antimicrobial approaches. **Key Features:** Includes comprehensive knowledge on metal nanoparticle synthesis, characterization, mathematical modeling, kinetic studies and their antimicrobial approaches Lays out concepts of essential oil nanoemulsion and their potential antimicrobial applications Deals with the latest development in nano-starch composite biofilms containing bioactive constituents to inhibit pathogenic microbes Explores the nanocapsules as potential antimicrobial agents in food. Provides information regarding new biogenic nano-antimicrobials developed for the food safety and quality assurance This book will educate readers on the aspects of nanotechnology in food safety and quality assurance. Nanoemulsions, nanohydrogels, metal nanoparticles, nano-starch films, nanocapsules and nano-antimicrobials are the emerging essentials of nanotechnology that are used to preserve the food at greater extent. This book should be of interest to a large and varied audience of researchers in academia, industry, food processing, preservation, packaging, microbiology and policy regulations.

Aflatoxin Control, Analysis, Detection and Health Risks BoD – Books on Demand Do you care about your environment and your health? Contamination by hazardous substances in environmental matrices, including landfills, oil fields, and manufacturing and industrial sites, represents a global concern and needs to be remediated since it poses a serious risk to the environment and human health. Particular attention should also be paid to the use of medical devices and recent developments in the use of nanoparticles expressed as drug delivery systems designed to treat a wide variety of diseases. This Special Issue collects a compilation of articles that strongly demonstrate the continuous efforts made in developing advanced and safe nanomaterial-based technologies for nano-

remediation and for drug delivery and other biomedical applications. It covers the most recent advances in the safe nanomaterials synthesis field as well as in environmental applications, in the use of restorative materials, drug delivery and other clinical applications, in order to lay the foundations for a cleaner and healthier future.

Food Structure and Functionality helps users further understand the latest research related to food structuring and de-structuring, with an emphasis on structuring to achieve improved texture, taste perception, health and shelf-stability. Topics covered address food structure, nanotechnology and functionality, with an emphasis on the novel experimental and modeling approaches used to link structure and functionality in food. The book also covers food structure design across the lifespan, as well as design for healthcare and medical applications. Dairy matrices for oral and gut functionality is also discussed, as is deconstructing dairy matrices for the release of nutrient and flavor components. This book will benefit food scientists, technologists, engineers and physical chemists working in the whole food science field, new product developers, researchers, academics and professionals working in the food industry, including nutritionists, dieticians, physicians, biochemists and biophysicists. Covers recent trends related to non-thermal processes, nanotechnology and modern food structures in the food industry Begins with an introduction to the structure/function of food products and their characterization methods Addresses biopolymer composites, interfacial layers in food emulsions, amyloid-like fibrillary structures, self-assembly in foods, lipid nano-carriers, microfluidics, rheology and function of hydrocolloids Discusses applications and the effects of emerging technologies on process, structure and function relationships

Biomaterials and Bionanotechnology examines the current state of the field within pharmaceutical sciences and concisely explains the history of biomaterials including key developments. Written by experts in the field, this volume within the Advances in Pharmaceutical Product Development and Research series deepens understanding of biomaterials and bionanotechnology within drug discovery and drug development. Each chapter delves into a particular aspect of this fast-moving field to cover the fundamental principles, advanced methodologies and technologies employed by pharmaceutical scientists, researchers and pharmaceutical industries to transform a drug candidate or new chemical entity into a final administrable dosage form, with particular focus on biomaterials and bionanomaterials. This book provides a comprehensive examination suitable for researchers working in the pharmaceutical, cosmetics, biotechnology, food and related industries as well as advanced students in these fields. Examines the most recent developments in biomaterials and nanomaterials for pharmaceutical sciences Covers important topics, such as the fundamentals of polymers science, transportation and bio interaction of properties in nanomaterials across biological systems, and nanotechnology in

tissue engineering as they pertain specifically to pharmaceutical sciences
Contains extensive references for further discovery on the role of biomaterials and nanomaterials in the drug discovery process

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 scientists and biomedical engineers who want to learn more about how nanomaterials are engineered and used in the design of drug delivery nanosystems

Mycotic keratitis, also known as fungal keratitis, is commonly defined as an inflammation of the cornea. Globally, mycotic keratitis is more common as compared to other eye disorders. Though it occurs in all parts of the world it is more prevalent in tropical and subtropical areas. Mycotic Keratitis emphasizes novel perspectives on mycotic keratitis treatments and addresses different therapies used in treatment. The book is designed to be immensely useful for the students and teachers of microbiology, medicine, mycology, ophthalmology, biotechnology and nanotechnology. Medical microbiology researchers in general and medical mycology in particular will find it a valuable user-friendly book.

Nature has consistently provided human beings with bioactive compounds that can be used directly as drugs or indirectly as drug leads. Some of the major classes of natural bioactive compounds include phenolics, alkaloids, tannins, saponins, lignin, glycosides, terpenoids, and many more. They possess a broad range of biological activities and are primarily useful in the treatment of various health issues. At the same time, the search for new and novel drugs is never-ending and, despite major advances in synthetic chemistry, nature remains an essential resource for drug discovery. Therefore, more and more researchers are interested in understanding the chemistry, clinical pharmacology, and beneficial effects of bioactive compounds in connection with solving human health problems. This book presents a wealth of information on natural metabolites that have been or are currently being used as drugs or leads for the discovery of new drugs. In addition, it highlights the importance of natural products against various

human diseases, and their applications in the drug, nutraceuticals, cosmetics and herbal industries. Accordingly, the book offers a valuable resource for all students, educators, and healthcare experts involved in natural product research, phytochemistry, and pharmacological research.

Nanoemulsions: Formulation, Applications, and Characterization provides detailed information on the production, application and characterization of food nanoemulsion as presented by experts who share a wealth of experience. Those involved in the nutraceutical, pharmaceutical and cosmetic industries will find this a useful reference as it addresses findings related to different preparation and formulation methods of nanoemulsions and their application in different fields and products. As the last decade has seen a major shift from conventional emulsification processes towards nanoemulsions that both increase the efficiency and stability of emulsions and improve targeted drug and nutraceutical delivery, this book is a timely resource. Summarizes general aspects of food

nanoemulsions and their formulation Provides detailed information on the production, application, and characterization of food nanoemulsion Reveals the potential of nanoemulsions, as well as their novel applications in functional foods, nutraceutical products, delivery systems, and cosmetic formulations Explains preparation of nanoemulsions by both low- and high-energy methods

Nanotechnology in Modern Animal Biotechnology: Concepts and Applications discusses the advancement of nanotechnologies in almost every field, ranging from materials science, to food, forensic, agriculture and life sciences, including biotechnology and medicine. Nanotechnology is already being harnessed to address many of the key problems in animal biotechnology, with future applications covering animal biotechnology (e.g. animal nutrition, health, disease diagnosis, and drug delivery). This book provides the tools, ideas and techniques of nanoscale principles to investigate, understand and transform biological systems. Nanotechnology provides the ability to manipulate materials at atomic and molecular levels and also arrange atom-by-atom on a scale of 1–100 nm to create, new materials and devices with fundamentally new functions and properties arising due to their small scale. Details the basics of nanotechnology, along with comprehensive information on the state-of-the-art and future perspectives of nanotechnology in biosensors Provides recent perspectives and the challenges of nanomedicine Provides new insights into the role nanomaterials can play in curing various diseases Includes the most recent diagnostic methods, such as nanosensors

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Materials for Biomedical Engineering: Bioactive Materials, Properties, and Applications introduces the reader to a broad range of the different types of bioactive materials used in biomedical engineering. All the main types of bioactive materials are discussed, with an emphasis placed on their synthesis, properties, performance, and potential for biomedical applications. Key chapters on modeling and surface modification and methods provide the step-by-step information needed by researchers. Important applications of bioactive materials, such as drug delivery, cancer therapy and clinical dentistry are also highlighted in detail. Final sections look at future perspectives for bioactive materials in biomedical engineering. Provides a knowledge of the range of bioactive materials available, enabling the reader to make optimal materials selection decisions. Presents detailed information on current and proposed applications of the latest bioactive materials, thus empowering readers to design innovative products and processes. Covers methods and provides the detailed guidance needed by researchers to replicate key procedures and contribute to further research and discovery in this important field.

Actinobacteria are highly diverse prokaryotes that are ubiquitous in soil, freshwater and marine ecosystems. Although various studies have focused on the ecology of this phylum, data are still scant on the diversity, abundance and ecology of actinobacteria endemic to special and extreme environments, such as gut, plant, alkaline saline soil, deep sea sediments, hot springs and other habitats. Actinobacteria are well-known producers of a vast array of secondary metabolites, many of which have useful applications in medicine and agriculture. Furthermore, actinobacteria also have diverse functions in different environments apart from antibiotic production. For example, actinobacteria are reported to contribute to the break-down and recycling of organic compounds. They play a significant role in fixation of nitrogen, improvement plant growth, biodegradation, bioremediation and environmental protection. Therefore, understanding the actinobacterial diversity and distribution in such special environments is important in deciphering the ecological roles of these microorganisms and for biotechnological bioprospecting. Recent advances in cultivation, DNA sequencing technologies and -omics (metagenomics, metaproteomics etc) methods have greatly contributed to the rapid advancement of our understanding of microbial diversity, function and they interactions with environment. Furthermore, comparative genomic studies can provide overall information about actinobacterial speciation, evolution, metabolism and environment adaptation.

mechanisms. This research topic comprising reviews and original articles highlights the recent advances regarding the unexpectedly diverse/rare group of actinobacteria with special selective isolation methods or culture-independent methods, as well as their biological activities, ecophysiological function and mechanisms from diverse special and extreme environments.

Lipid-Based Nanocarriers for Drug Delivery and Diagnosis explores the present state of widely used lipid-based nanoparticulate delivery systems, such as solid lipid nanoparticles (SLN), nanostructured lipid carriers (NLC), nanoliposomes, micelles, nanoemulsions, nanosuspensions and lipid nanotubes. The various types of lipids that can be exploited for drug delivery and their chemical composition and physicochemical characteristics are reviewed in detail, along with their characterization aspects and effects of their dimensions on drug delivery systems behavior in-vitro and in-vivo. The book covers the effective utilization of these lipids based systems for controlled and targeted delivery of potential drugs/genes for enhanced clinical efficacy. Provides the present state of widely used lipid-based nanoparticulate delivery systems Explores how lipid-based nanocarriers improve drug delivery safety Describes the nanoformulation design and the preparation methods of lipid-based nanocarriers

Designed to foster a stronger awareness and exploration of the subject by practicing clinicians, medical researchers and scientists, The Clinical Nanomedicine Handbook discusses the integration of nanotechnology, biology, and medicine from a clinical point of view. The book highlights relevant research and applications by specialty; it examines nanotechnology in depth, and the potential to solve medical problems. It also increases literacy in nanotechnology, and allows for more effective communication and collaboration between disciplines. Details worldwide developments in nanomedicine Provides a comprehensive roadmap of the state of nanomedicine in numerous medical specialties Bridges the gap between basic science research, engineering, nanotechnology, and medicine This text discusses what nanomedicine is, how it is currently used, and considers its potential for future applications. It serves as a reference for clinicians, including physicians, nurses, health-care providers, dentists, scientists, and researchers involved in clinical applications of nanotechnology.

As the application of nanotechnology in the myriad disciplines of science and engineering--from agriculture, pharmaceuticals, material science, and biotechnology to sensors, electronics, and mechanical and electrical engineering--brings benefits it also can produce serious threats to human health and the environment that must be evaluated. The unique properties of nanomaterials make them different from their bulk counterparts. In addition to such unique properties, the nanometric size of nanomaterials can invite some detrimental effects on the health and well-being of living organisms and the environment. Thus, it is important to distinguish nanomaterials with such ill effects from nanomaterials with no or minimum toxicity. Nanotoxicology: Toxicity

Evaluation, Risk Assessment and Management covers issues such as the basic principles of nanotoxicity, methods used for nanotoxicity evaluation, risk assessment and its management for nanomaterial toxicity with a focus on current trends, limitations, challenges, and future directions of nanotoxicity evaluation. Various experts from different countries discuss these issues in detail in this book. This will be helpful to researchers, educators, and students who are interested in research opportunities for avoiding the environmental and health hazards of nanomaterials. This book will also be useful for industrial practitioners, policy makers, and other professionals in the fields of toxicology, medicine, pharmacology, food, drugs, and other regulatory sciences.

Handbook of Hydrocolloids, Third Edition is a must-have substantive reference on hydrocolloids, helping food industry scientists ever since its first edition was published and well received. This thoroughly updated and expanded edition reviews the structure, function, properties, and applications of a broad range of hydrocolloids used in food and related industries. The third edition updates existing chapters on developments and theories on the structure and functional characteristics of individual hydrocolloids. The book provides additional chapters on new techniques for the chemical and physicochemical characterization of hydrocolloids, and applications technologies for encapsulation and controlled release of active compounds. Edited by two leading international authorities in the field, this third edition continues to be relevant to food industry researchers, food manufacturers, graduate and postgraduate students, particularly in food, pharmaceutical, and cosmetic sciences. Introduces to food hydrocolloids considering regulatory aspects and functional characteristics Examines the manufacture, structure, function, and applications of over twenty-five hydrocolloids Brings a detailed overview of the function of hydrocolloids as emulsifiers, rheological modifiers, film formers, and encapsulation agents Smart Nanocontainers explores the fundamental concepts and emerging applications of nanocontainers in biomedicine, pharmaceuticals and smart materials. In pharmaceuticals, nanocontainers have advantages over their micro-counterparts, including more efficient drug detoxification, higher intracellular uptake, better stability, less side effects and higher biocompatibility with tissue and cells. In materials science, such as coating technology, they help by making coatings smarter, stronger and more durable. This important reference will help anyone who wants to learn more on how nanocontainers are used to provide the controlled release of active agents, including their applications in smart coatings, corrosion, drug delivery, diagnosis, agri-food and gas storage. Discusses how the molecular design of nanocarriers can be optimized to increase performance Explores how nanocarriers are being used to produce a new generation of active coatings Explains how nanocarriers are being used to deliver more effective nanoscale drug delivery

Plants produce chemicals as part of their normal metabolic activities. These include primary metabolites found in all plants, such as sugars and fats, as well

as secondary metabolites, which can have therapeutic effects in humans and be refined to produce drugs. Plants synthesize a bewildering variety of phytochemicals, but most are derivatives of a few biochemical motifs. Numerous herbal-derived substances have been evaluated for their therapeutic potential. These include alkaloids, coumarins, saponins, plant pigments and flavonoids. Flavonoids, carotenoids and anthocyanins are probably the best known of these substances due to their antioxidant properties. Carotenoids: Structure and Function in the Human Body presents comprehensive coverage of carotenoids. The text covers the scientific literature and clinical significance of this organic pigment, with an emphasis on its therapeutic potential. The authors approach carotenoids from a range of perspectives, from their structural and physicochemical properties to their distribution in nature, interaction with the human metabolism, and use as a coloring agent in various products. The intake, metabolism and secretion of anthocyanins in the human body are covered in-depth, as are the biosynthetic pathways through which these compounds are synthesized in the natural system. Factors affecting stability and extraction are listed, and health-related uses and biological activities are covered in great detail. Present and future trends in carotenoid research are also presented. This book provides a solid background in carotenoids for researchers and professionals in food science, food technology, nutrition, biology, chemistry and medical sciences.

New Pesticides and Soil Sensors, a volume in the Nanotechnology in the Agri-Food Industry series, is a practical resource that demonstrates how nanotechnology is a highly attractive tool that offers new options for the formulation of 'nanopesticides'. Recent advances in nanopesticide research is reviewed and divided into several themes, including improvement of the water solubility of poorly soluble pesticide active ingredients to improve bioavailability and the encapsulation of pesticide active ingredients within permeable nanoparticles with the aim of releasing pesticide active ingredients in a controlled or targeted manner, while also protecting active ingredients from premature photo-degradation. Provides examples of pesticide formulations that contain inorganic and organic nanoparticles Includes general principles and the most recent applications of chemical sensors and multisensory systems for the assessment of soils and main soil nutrition component detection Presents the main benefits and drawbacks of chemical sensors and their employment in soil analysis for further applications Describes current issues of pesticide use, environmental contamination, bioaccumulation, and increases in pest resistance which demands a reduction in the quantity of pesticides applied for crop and stored product protection

Nanostructures for Oral Medicine presents an up-to-date examination of the applications and effects of nanostructured materials in oral medicine, with each chapter addressing recent developments, specific applications, and uses of nanostructures in the oral administration of therapeutic agents in dentistry. The book also includes coverage of the biocompatibility of nanobiomaterials and their remarkable potential in improving human health and in reducing environmental pollution. Emerging advances, such as Dr. Franklin Tay's concept of a new

nanotechnology process of growing extremely small, mineral-rich crystals and guiding them into the demineralized gaps between collagen fibers to prevent the aging and degradation of resin-dentin bonding is also discussed. This work will be of great value to those who work in oral medicine, providing them with a resource to gain a greater understanding of how nanotechnology can help them create more efficient, cost-effective products. In addition, it will be of great interest to those who work in materials science who wish to gain a greater appreciation of how nanostructured materials are applied in this field. Outlines the major uses of nanostructured materials for oral medicine, including the properties of each material discussed and how it should best be applied Explores how nanostructured materials enable the creation of more effective drug delivery systems in oral medicine Discusses how novel uses of nanostructured materials may be applied in oral medicine to create more effective devices

Alginate is a hydrophilic, biocompatible, biodegradable, and relatively economical polymer generally found in marine brown algae. The modification in the alginate molecule after polymerization has shown strong potential in biomedical, pharmaceutical and biotechnology applications such as wound dressing, drug delivery, dental treatment, in cell culture and tissue engineering. Besides this, alginates have industrial applications too in the paper and food industries as plasticizers and additives. The few books that have been published on alginates focus more on their biology. This current book focuses on the exploration of alginates and their modification, characterization, derivatives, composites, hydrogels as well as the new and emerging applications.

Nanotechnology-based Sustainable Alternatives for the Management of Plant Diseases addresses the power of sustainable nanomaterials for plant and food protection. The book highlights dangers arising from bacteria, fungi, viruses, insects, seeds, plants, fruits and food production and summarizes new and sustainable strategies. It places a particular focus on plant pathogen control, and in the food packaging sector in agri-food applications. The control of plant pathogens in plants and in food has been conventionally made by adding chemical preservatives and by using thermal processing, but sustainable nanotechnology can be a powerful tool to aid in this complex set of challenges. Advances in materials science have led to the rapid development of nanotechnology that has great potential for improving food safety as a powerful tool for the delivery and controlled release of natural antimicrobials. Analyzes and lays out information related to sustainable strategies, taking a nano-based approach to the management of plant diseases and biotic damage on fresh food Presents the latest discoveries and practical applications of nanotechnology based, sustainable plant protection strategies to combat dangerous microorganisms and improve the shelf-life of food Assesses the major challenges of manufacturing nanotechnology-based pesticides on a mass scale

Nanopharmaceuticals reviews advances in the drug delivery field via nanovehicles or nanocarriers that offer benefits like targeted therapy and serves as a single dose magic bullet for multiple drug delivery with improved drug efficiency at a lower dose, transportation of the drug across physiological barriers as well as reduced drug-related toxicity. The chapters are written by a diverse group of international researchers from industry and academia. The series Expectations and Realities of Multifunctional Drug Delivery Systems examines the fabrication, optimization, biological aspects, regulatory and clinical success of wide range of drug delivery carriers. This series reviews multifunctionality and applications of drug delivery systems, industrial trends, regulatory challenges and in vivo success stories. Throughout the volumes discussions on diverse aspects of drug delivery carriers, such as clinical, engineering, and regulatory, facilitate insight sharing across expertise area and form a link for collaborations between industry-academic scientists and clinical researchers. Expectations and Realities of Multifunctional Drug Delivery Systems connects formulation scientists, regulatory experts, engineers, clinical experts and regulatory stake holders. The wide scope of the book ensures it

as a valuable reference resource for researchers in both academia and the pharmaceutical industry who want to learn more about drug delivery systems. Other volumes in the Expectations and Realities of Multifunctional Drug Delivery Systems book series: Delivery of Drugs, Volume 2, 9780128177761 Drug Delivery Trends, Volume 3, 9780128178706 Drug Delivery Aspects, Volume 4, 9780128212226 Encompasses functional aspects of nanocarriers Discusses Intellectual Property landscapes of micro-nano drug carriers Contains in-depth investigation of specific aspects of drug delivery systems

During last couple of decades, a great deal of research has explored what exactly plants contain (bioactives) and how these molecules may interact with human physiology at the molecular level. It is extremely important to know what happens to plant bioactives or their biological activities when processed or isolated under various reaction conditions. Huge numbers of extraction or food manufacturing methodologies are adversely affecting the quality of these phytonutrients so there is a prompt need to highlight these processes/methods and replace them with more novel, efficient, green, or eco-friendly ones. A Centum of Valuable Plant Bioactives is a comprehensive resource on the top 100 plant bioactives available. Chapters are grouped together by bioactives, with sections on carotenes, xanthophylls, terpenoids, steroids, polyphenols and more. This is an essential guide for botanists, food technologists and chemists, nutritionists and pharmacists. Highlights the top 100 plant bioactives, their biogenesis, distribution, extraction/purification, and metabolism Contains the latest advances in botanic biology, analytical chemistry and food technology Explores potential applications including food additives, digestion and health, chemoprevention and biotherapy This book compiles the latest information in the field of antibacterial discovery, especially with regard to the looming threat of multi-drug resistance. The respective chapters highlight the discovery of new antibacterial and anti-infective compounds derived from microbes, plants, and other natural sources. The potential applications of nanotechnology to the fields of antibacterial discovery and drug delivery are also discussed, and one section of the book is dedicated to the use of computational tools and metagenomics in antibiotic drug discovery. Techniques for efficient drug delivery are also covered. The book provides a comprehensive overview of the progress made in both antibacterial discovery and delivery, making it a valuable resource for academic researchers, as well as those working in the pharmaceutical industry.

Liquid crystals exhibit amazingly interesting properties that make them indispensable for several technological applications. The book Liquid Crystals - Recent Advancements in Fundamental and Device Technologies is aimed to focus on various aspects of research and development that liquid crystal mediums have come across in recent years. This would be ranging from the physical and chemical properties to the important applications that the liquid crystals have in our everyday life. It is expected that the book will make the expert researchers to be abreast of recent research advancements, whereas the novice researchers will benefit from both the conceptual understanding and the recent developments in the area. Multitudes of research themes and directions pivoted to liquid crystals remain the essence, which the readers would get the glimpse of and move ahead for further investigations.

Industrial Applications of Nanomaterials explains the industry based applications of nanomaterials, along with their environmental impacts, lifecycle analysis, safety and sustainability. This book brings together the industrial applications of nanomaterials with the incorporation of various technologies and areas, covering new trends and challenges. Significant properties, safety and sustainability and environmental impacts of synthesis routes are also explored, as are major industrial applications, including agriculture, medicine, communication, construction, energy, and in the military. This book is an important information source for those in research and development who want to gain a greater understanding of how nanotechnology is being used to create cheaper, more efficient products. Explains how different classes of nanomaterials are being used to create cheaper, more efficient products

Read Book Nanoemulsion A Method To Improve The Solubility Of

Explores the environmental impacts of using a variety of nanomaterials Discusses the challenges faced by engineers looking to integrate nanotechnology in new product development

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