

# The Efficiency Of Glyceryl Behenate As Sustained Release

Nanoencapsulation of Food Bioactive Ingredients: Principles and Applications brings different nanoencapsulated food bioactive ingredients, their structure, applications, preparation, formulations and encapsulation methodologies, covering a wide range of compounds and giving detailed examples of the issues faced in their nano-encapsulation. The book addresses findings related to the study of natural food colorants, vitamins, antimicrobial agents, phenolic compounds, antioxidants, flavors, essential oils, fish oil and essential fatty acids, and other related ingredients. As a definitive manual for researchers and industry personnel working, or interested in, various branches of encapsulation for food ingredients and nutraceutical purposes, users will find this a great reference. Explains different categories of nanoencapsulated food ingredients, covering their applications, nanoencapsulation techniques, release mechanisms and characterization methods Addresses findings related to the study of natural food colorants, vitamins, antimicrobial agents, phenolic compounds, antioxidants, flavors and essential oils Provides a deep understanding and potential of nanoencapsulated food ingredients, as well as their novel applications in functional foods and nutraceutical systems

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

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

This book covers nanotechnology based approaches for improving the therapeutic efficacy of natural products. It critically explores lipid nanoarchitectonics, inorganic particles and nanoemulsion based tools for delivering them. With its chapters from eminent experts working in this discipline, it is ideal for researchers and professionals working in the area.

Nanoencapsulation has the potential to improve human health through its capacity to both protect bioactive compounds and release them at a specific time and location into various substances, including food. Numerous nanoencapsulation technologies have emerged in recent years, each with its own advantages and disadvantages. The goal of this Brief is to discuss the various nanoencapsulation technologies, such as

emulsification, coacervation, inclusion encapsulation, anti-solvent precipitation, nanoprecipitation, freeze drying, and spray drying, including their limitations. Recent safety and regulatory issues concerning the various nanoencapsulation technologies will also be covered.

This book presents cutting-edge research and developments in the field of medical and biological engineering. It gathers the proceedings of the International Conference on Medical and Biological Engineering, CMBEBIH 2021, held partly virtually, partly physically, on April 21-24, 2021, from and in Mostar, Bosnia and Herzegovina. Focusing on the goal to 'Stay Focused', contributions report on both basic and applied research in a wide range of related fields, such as biomedical signal processing, medical physics and imaging, biosensors and micro/nanotechnologies, biomaterials, biomechanics and robotics, cardiorespiratory, endocrine and neural systems engineering. Novel models, methods and technologies for bio- and health informatics, as well as applications of machine learning and AI in health care, and advances in genetic engineering are also highlighted. All in all, this book provides academics and professionals with novel, practical solutions to solve the current problems in biomedical research and applications, and a source of inspiration for improving medicine and health care in the future. .

Hot-melt extrusion (HME) - melting a substance and forcing it through an orifice under controlled conditions to form a new material - is an emerging processing technology in

the pharmaceutical industry for the preparation of various dosage forms and drug delivery systems, for example granules and sustained release tablets. Hot-Melt Extrusion: Pharmaceutical Applications covers the main instrumentation, operation principles and theoretical background of HME. It then focuses on HME drug delivery systems, dosage forms and clinical studies (including pharmacokinetics and bioavailability) of HME products. Finally, the book includes some recent and novel HME applications, scale-up considerations and regulatory issues. Topics covered include: principles and die design of single screw extrusion twin screw extrusion techniques and practices in the laboratory and on production scale HME developments for the pharmaceutical industry solubility parameters for prediction of drug/polymer miscibility in HME formulations the influence of plasticizers in HME applications of polymethacrylate polymers in HME HME of ethylcellulose, hypromellose, and polyethylene oxide bioadhesion properties of polymeric films produced by HME taste masking using HME clinical studies, bioavailability and pharmacokinetics of HME products injection moulding and HME processing for pharmaceutical materials laminar dispersive & distributive mixing with dissolution and applications to HME technological considerations related to scale-up of HME processes devices and implant systems by HME an FDA perspective on HME product and process understanding improved process understanding and control of an HME process with near-infrared spectroscopy Hot-Melt Extrusion: Pharmaceutical Applications is an essential multidisciplinary guide

to the emerging pharmaceutical uses of this processing technology for researchers in academia and industry working in drug formulation and delivery, pharmaceutical engineering and processing, and polymers and materials science. This is the first book from our brand new series *Advances in Pharmaceutical Technology*. Find out more about the series here.

Diabetes Mellitus, a syndrome of disordered metabolism, characterised by abnormal elevation in blood glucose level, has become a life-threatening condition for many people. Current means of therapy for Diabetes Mellitus do not mimic the normal physiological pattern of insulin release. Oral delivery is the preferred route of administration due to its non-invasive nature. Oral delivery of insulin presents an overview of Diabetes Mellitus, and discusses the strategies and techniques adopted for oral delivery of insulin. This title begins with an introductory chapter on symptoms, complications and therapy for Diabetes Mellitus. Subsequent chapters cover the various routes for administering insulin; the challenges and strategies of oral delivery; experimental techniques in the development of an oral insulin carrier; lipids; inorganic nanoparticles and polymers in oral insulin delivery; and a summary and presentation of future perspectives on oral delivery of insulin. Presents an overview of Diabetes Mellitus Includes a discussion of various strategies and techniques adopted for oral delivery of insulin Presents an update of research in the field

This volume provides readers with the basic principles and fundamentals of extrusion

technology and a detailed description of the practical applications of a variety of extrusion processes, including various pharma grade extruders. In addition, the downstream production of films, pellets and tablets, for example, for oral and other delivery routes, are presented and discussed utilizing melt extrusion. This book is the first of its kind that discusses extensively the well-developed science of extrusion technology as applied to pharmaceutical drug product development and manufacturing. By covering a wide range of relevant topics, the text brings together all technical information necessary to develop and market pharmaceutical dosage forms that meet current quality and regulatory requirements. As extrusion technology continues to be refined further, usage of extruder systems and the array of applications will continue to expand, but the core technologies will remain the same.

Esse trabalho teve com objetivo desenvolver micropartículas lipídicas contendo quercetina com vistas à sua liberação pulmonar, para o tratamento da asma. As micropartículas foram obtidas a partir de uma mistura de trimiristato de glicerila e lecitina de soja (MTL), pela técnica de difusão do solvente a quente, ou a partir do behenato de glicerila, na presença (MBL) ou ausência de lecitina (MB) de soja, pelo método de homogeneização a quente. A quercetina foi adicionada nas formulações na proporção de 1:25 e 1:50 em relação à massa de lipídio. Valores de EE e teor de fármaco (mg/100mg) variaram de 29,35 a 99,80% e 0,52 a 3,84% (m/m), respectivamente. Partículas esféricas e de superfície rugosas foram obtidas, conforme mostrado nas micrografias obtidas por MEV. As micropartículas apresentaram porosidade entre 68,83 e 85,94%, baixos valores de densidade bruta e de compactação e propriedades de fluidez variáveis entre boa e favorável a tolerável, conforme valor calculado de Índice de Carr. As micropartículas foram caracterizadas quanto ao diâmetro geométrico (MMGD) pela

técnica de difração a laser. Os valores de diâmetro médio equivalente em volume variaram de 6,67 a 8,43  $\mu$ m, 18,16 a 26,71  $\mu$ m e 23,11 a 34,30  $\mu$ m para MTL, MB e MBL, respectivamente. Entretanto, valores de  $d_{50\%}$  (diâmetro correspondente a 50% da distribuição acumulada) foram menores variando de 5,59 a 6,84  $\mu$ m, 6,23 a 9,04  $\mu$ m e 17,53 a 25,62  $\mu$ m para MTL, MB e MBL, respectivamente. A partir dos dados de porosidade, densidade esquelética, MMGD, e  $d_{50\%}$ , os valores de diâmetro aerodinâmico (MMAD) foram calculados e variaram entre 3 a 12,5  $\mu$ m, respectivamente. Com base nesses resultados, as micropartículas de trimiristato de glicerila mostraram características mais aceitáveis para a administração pulmonar, enquanto aquelas preparadas com behenato de glicerila contendo lecitina de soja apresentaram valores de MMAD $_{50\%}$  adequados, indicando que somente uma fração fina respirável das partículas é capaz de se depositar nas regiões mais profundas do pulmão. As análises por calorimetria exploratória diferencial e difração de raios-X das matérias-primas e das micropartículas de trimiristato de glicerila e behenato de glicerila evidenciaram a presença dos polimorfos  $\alpha'$  e  $\beta'$ , respectivamente, indicando que a técnica de preparação não conduziu a alterações polimórficas. Por espectroscopia Raman ainda foi possível visualizar a existência de interação entre o behenato de glicerila e a lecitina de soja, uma vez que houve grande interferência na intensidade Raman devido fluorescência da lecitina, fator não observado nas amostras com trimiristato de glicerila contendo lecitina de soja. A quercetina foi avaliada ainda quanto a sua estabilidade química frente ao processo de preparação das micropartículas por espectroscopia no UV sendo observado que este não interfere na integridade química do polifenol. O perfil de liberação da quercetina a partir das micropartículas lipídicas foi afetado pela composição das formulações, conforme evidenciado pela análise da ANOVA dos valores de eficiência de

dissolução. O conjunto dos resultados mostrou que as micropartículas lipídicas apresentam grande potencial para carrear a quercetina para os pulmões.

*Design of Nanostructures for Versatile Therapeutic Applications* focuses on antimicrobial, antioxidant and nutraceutical applications of nanostructured materials. Many books discuss these subjects, but not from a pharmaceutical point-of-view. This book covers novel approaches related to the modulation of microbial biofilms, antimicrobial therapy and encapsulate polyphenols as antioxidants. Written by an internationally diverse group of academics, this book is an important reference resource for researchers, both in biomaterials science and the pharmaceutical industry. Assesses the most recently developed nanostructures that have potential antimicrobial properties, explaining their novel mechanical aspects Shows how nanoantibiotics can be used to more effectively treat disease Provides a cogent summary of recent developments in nanoantimicrobial discovery, allowing readers to quickly familiarize themselves with the topic

*Developing Solid Oral Dosage Forms: Pharmaceutical Theory and Practice, Second Edition* illustrates how to develop high-quality, safe, and effective pharmaceutical products by discussing the latest techniques, tools, and scientific advances in preformulation investigation, formulation, process design, characterization, scale-up, and production operations. This book covers the essential principles of physical pharmacy, biopharmaceutics, and industrial pharmacy, and their application to the research and development process of oral dosage forms. Chapters have been added, combined, deleted, and completely revised as necessary to produce a comprehensive, well-organized, valuable reference for industry professionals and academics engaged in all aspects of the development process. New and important topics

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include spray drying, amorphous solid dispersion using hot-melt extrusion, modeling and simulation, bioequivalence of complex modified-released dosage forms, biowaivers, and much more. Written and edited by an international team of leading experts with experience and knowledge across industry, academia, and regulatory settings Includes new chapters covering the pharmaceutical applications of surface phenomenon, predictive biopharmaceutics and pharmacokinetics, the development of formulations for drug discovery support, and much more Presents new case studies throughout, and a section completely devoted to regulatory aspects, including global product regulation and international perspectives

Like any other book on the subject of HIV/AIDS, this book is not a substitute or exhausting the subject in question. It aims at complementing what is already in circulation and adds value to clarification of certain concepts to create more room for reasoning and being part of the solution to this global pandemic. It is further expected to complement a wide range of studies done on this subject, and provide a platform for the more updated information on this subject. It is the hope of the authors that the book will provide the readers with more knowledge and skills to do more to reduce HIV transmission and improve the quality of life of those that are infected or affected by HIV/AIDS.

Materials for Biomedical Engineering: Organic Micro- and Nanostructures provides an updated perspective on recent research regarding the use of organic particles in biomedical applications. The different types of organic micro- and nanostructures are discussed, as are innovative applications and new synthesis methods. As biomedical applications of organic micro- and nanostructures are very diverse and their impact on modern and future therapy, diagnosis and prophylaxis of diseases is huge, this book presents a timely resource on the

topic. Users will find the latest information on cancer and gene therapy, diagnosis, drug delivery, green synthesis of nano- and microparticles, and much more. Provides knowledge of the range of organic micro- and nanostructures available, enabling the reader to make optimal materials selection decisions Presents detailed information on current and proposed applications of the latest biomedical materials Places a strong emphasis on the characterization, production and use of organic nanoparticles in biomedicine, such as gene therapy, DNA interaction and cancer management

Issues in Nanotechnology / 2011 Edition is a ScholarlyBrief™ that delivers timely, authoritative, comprehensive, and specialized information about Nanotechnology in a concise format. The editors have built Issues in Nanotechnology: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Nanotechnology in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Nanotechnology / 2011 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/>.

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

Applications of Nanobiotechnology for Neglected Tropical Diseases describes recent advances in nanobiotechnology that can be applied to reducing the global disease burden of neglected tropical diseases (NTDs). The book explores the application of nanotechnology on the development of safe, effective, and reliable tools to prevent, diagnose, and treat NTDs. Furthermore, Applications of Nanobiotechnology for Neglected Tropical Diseases includes multidisciplinary content, combining knowledge from biochemistry, medicinal chemistry, material sciences, pharmacology, and pharmaceuticals. The book is divided into three main parts, each outlining one major type of approach: (1) nano-based approaches for prevention, (2) nano-diagnostics and detection, and (3) nanotherapeutics. Each part contains chapters that delve into the different applications of the type of approach being presented in that part. A

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discussion of other approaches against NTD follows these three parts. This book is remarkable in its ability to encompass and thoroughly explain the latest techniques in nanobiotechnology, from basic research to patient-oriented investigation. Offers a broad overview of nanobiotechnology applied to the prevention, diagnostics, and treatment of NTDs Presents cutting-edge recent advances in nanobiotechnology, focusing on diseases reported by the World Health Organization's NTDs Roadmap (e.g., leishmaniasis, malaria, schistosomiasis, filariasis, etc.) Provides a deep discussion about ground-breaking approaches designed to meet the medical needs of patients suffering from NTDs Gives examples of multidisciplinary investigations into NTDs, from research labs to clinics

Lipid Nanocarriers for Drug Targeting presents recent advances in the area of lipid nanocarriers. The book focuses on cationic lipid nanocarriers, solid lipid nanocarriers, liposomes, thermosensitive vesicles, and cubosomes, with applications in phototherapy, cosmetic and others. As the first book related to lipid nanocarriers and their direct implication in pharmaceutical nanotechnology, this important reference resource is ideal for biomaterials scientists and those working in the medical and pharmaceutical industries that want to learn more on how lipids can be used to create more effective drug delivery systems. Highlights the most commonly used types of lipid nanocarriers and explains how they are applied in pharmacy Shows how lipid nanocarriers are used in different types of treatment, including oral medicine, skin repair and cancer treatment Assesses the pros and cons of using different lipid nanocarriers for different therapies

Presenting breakthrough research pertinent to scientists in a wide range of disciplines-from medicine and biotechnology to cosmetics and pharmacy-this Second Edition provides practical

approaches to complex formulation problems encountered in the development of particulate delivery systems at the micro- and nano-size level. Completely revised and e

Food process engineering, a branch of both food science and chemical engineering, has evolved over the years since its inception and still is a rapidly changing discipline. While traditionally the main objective of food process engineering was preservation and stabilization, the focus today has shifted to enhance health aspects, flavour and taste, nutrition, sustainable production, food security and also to ensure more diversity for the increasing demand of consumers. The food industry is becoming increasingly competitive and dynamic, and strives to develop high quality, freshly prepared food products. To achieve this objective, food manufacturers are today presented with a growing array of new technologies that have the potential to improve, or replace, conventional processing technologies, to deliver higher quality and better consumer targeted food products, which meet many, if not all, of the demands of the modern consumer. These new, or innovative, technologies are in various stages of development, including some still at the R&D stage, and others that have been commercialised as alternatives to conventional processing technologies. Food process engineering comprises a series of unit operations traditionally applied in the food industry. One major component of these operations relates to the application of heat, directly or indirectly, to provide foods free from pathogenic microorganisms, but also to enhance or intensify other processes, such as extraction, separation or modification of components. The last three decades have also witnessed the advent and adaptation of several operations, processes, and techniques aimed at producing high quality foods, with minimum alteration of sensory and nutritive properties. Some of these innovative technologies have significantly reduced the thermal component in

food processing, offering alternative nonthermal methods. *Food Processing Technologies: A Comprehensive Review* covers the latest advances in innovative and nonthermal processing, such as high pressure, pulsed electric fields, radiofrequency, high intensity pulsed light, ultrasound, irradiation and new hurdle technology. Each section will have an introductory article covering the basic principles and applications of each technology, and in-depth articles covering the currently available equipment (and/or the current state of development), food quality and safety, application to various sectors, food laws and regulations, consumer acceptance, advancements and future scope. It will also contain case studies and examples to illustrate state-of-the-art applications. Each section will serve as an excellent reference to food industry professionals involved in the processing of a wide range of food categories, e.g., meat, seafood, beverage, dairy, eggs, fruits and vegetable products, spices, herbs among others.

*Nanomaterials in Clinical Medicine: Case Studies in Nanomedicines* focuses on the nanomaterials that can be formulated as drug delivery vehicles, such as liposomes, micelles, nanoemulsions and nanogels. Their physicochemical, morphological, thermo-dynamical and nanotoxicological properties are analyzed with respect to the design and development of drug delivery nanosystems for the encapsulation of an active pharmaceutical ingredient and its controlled release. Each chapter covers basic properties, the nanosystem (e.g., liposomes), the added value in drug delivery and targeting, and future perspectives. Case studies and examples of how nanomaterials are being used in clinical medicine, including marketed liposomal medicines and medical utility and regimens are also included. Particular attention is given to new nanocarriers, such as elastic liposomes, lipid polymeric hybrid nanoparticles,

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organogel, nanofibers carbon nanomaterials, quantum dots and inorganic nanoparticles. This book is an important information source for those wanting to increase their understanding of what major nanomaterials are being used to create more effective drug delivery systems. Summarizes the major nanomaterials used in clinical medicine, explaining how their properties make them suitable for this purpose Explains how nanomaterials are used to create increasingly efficient drug delivery vehicles Includes real-life examples, demonstrating how nanomaterials are being used in medical practice

Nanotechnology seeks to exploit distinct technological advances controlling the structure of nanoscale biomaterials at a nanodimensional scale approaching individual molecules and their aggregates or supramolecular structures. The term "nanomedicine" is used to describe those technologies under the umbrella of nanotechnology that have therapeutic applications in human health. This book presents recent trends and research achievements in the field of pharmaceutical nanotechnology and advanced drug delivery nanosystems, especially for theranostic purposes. The applications of drug delivery nanosystems considered carriers of active pharmaceutical ingredients (APIs) (e.g., proteins, peptides, and nucleic acids) are analyzed on the basis of technology, preparation protocols, and biomedical applications. The book also extensively reports on the principles, design protocols, and applications of nanosystems in drug delivery, imaging, and targeting of active molecules of pharmaceutical interest.

This book explores the recent advancements in cutting-edge techniques and applications of Biotechnology. It provides an overview of prospects and applications while emphasizing modern, and emerging areas of Biotechnology. The chapters are dedicated to various field of

Biotechnology including, genome editing, probiotics, in-silico drug designing, nanoparticles and its applications, molecular diagnostics, tissue engineering, cryopreservation, and antioxidants. It is useful for both academicians and researchers in the various disciplines of life sciences, agricultural sciences, medicine, and Biotechnology in Universities, Research Institutions, and Biotech companies. This book provides the readers with a comprehensive knowledge of topics in Genomics, Bionanotechnology, Drug Designing, Diagnostics, Therapeutics, Food and Environmental Biotechnology. The chapters have been written with special reference to the latest developments in the frontier areas of Biotechnology that impacts the Biotech industries. Nanostructures for Antimicrobial Therapy discusses the pros and cons of the use of nanostructured materials in the prevention and eradication of infections, highlighting the efficient microbicidal effect of nanoparticles against antibiotic-resistant pathogens and biofilms. Conventional antibiotics are becoming ineffective towards microorganisms due to their widespread and often inappropriate use. As a result, the development of antibiotic resistance in microorganisms is increasingly being reported. New approaches are needed to confront the rising issues related to infectious diseases. The merging of biomaterials, such as chitosan, carrageenan, gelatin, poly (lactic-co-glycolic acid) with nanotechnology provides a promising platform for antimicrobial therapy as it provides a controlled way to target cells and induce the desired response without the adverse effects common to many traditional treatments. Nanoparticles represent one of the most promising therapeutic treatments to the problem caused by infectious micro-organisms resistant to traditional therapies. This volume discusses this promise in detail, and also discusses what challenges the greater use of nanoparticles might pose to medical professionals. The unique physiochemical properties of nanoparticles,

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combined with their growth inhibitory capacity against microbes has led to the upsurge in the research on nanoparticles as antimicrobials. The importance of bactericidal nanobiomaterials study will likely increase as development of resistant strains of bacteria against most potent antibiotics continues. Shows how nanoantibiotics can be used to more effectively treat disease Discusses the advantages and issues of a variety of different nanoantibiotics, enabling medics to select which best meets their needs Provides a cogent summary of recent developments in this field, allowing readers to quickly familiarize themselves with this topic area

This useful reference describes the statistical planning and design of pharmaceutical experiments, covering all stages in the development process—including preformulation, formulation, process study and optimization, scale-up, and robust process and formulation development. Shows how to overcome pharmaceutical, technological, and economic constraint

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 Explores the environmental impacts of using a variety of nanomaterials Discusses the challenges faced by engineers looking to integrate nanotechnology in new product development The book focuses on novel particulate technologies for the purpose of drug delivery to humans. Nowadays, macro and nano-scale particles are being investigated for targeted delivery of small and large biological macromolecules. The targeting of drugs can minimize the dosage regimen and reduces dose related potential toxicity of drug molecules, which in turn lead to increased potential compliance. Various types of organic, inorganic and polymer particles are currently being investigated. These are attracting the attention of the research workers in the field of drug delivery science and technology. This book covers polymersomes, inorganic- organic composites, gold nanoparticles biopolymer and synthetic polymer particles etc.All aspects of drug delivery in relation to each technology have been described including these advances, Easy to read and understand the content of each chapter Rich in up-to-date information regarding their application.

In recent years, emerging trends in the design and development of drug products have indicated ever greater need for integrated characterization of excipients and in-depth understanding of their roles in drug delivery applications. This book presents a concise summary of relevant scientific and mechanistic information that can aid the use of excipients in formulation design and drug delivery applications. Each chapter is contributed by chosen experts in their respective fields, which affords truly in-depth perspective into a spectrum of excipient-focused topics. This book captures current subjects of interest – with the most up to date research updates – in the field of pharmaceutical excipients. This includes areas of interest to the biopharmaceutical industry users, students, educators, excipient manufacturers, and regulatory bodies alike.

Brain Targeted Drug Delivery Systems: A Focus on Nanotechnology and Nanoparticulates provides a guide on nanoparticulates to both academic and industry researchers. The book discusses key points in the development of brain targeted drug delivery, summarizes available strategies, and considers the main problems and pitfalls evidenced in current studies on brain targeted drug delivery systems. As the brain is the most important organ in the human body, and disorders of the central nervous system (CNS) are the most serious threat to human life, this book highlights advances and new research in drug delivery

methods to the brain. Provides an overview of brain targeting drug delivery that is useful to both academic and industry-based researchers Discusses key points in developing brain targeting drug delivery systems Summarizes and presents currently available strategies for brain targeting drug delivery Covers not only current studies and their strengths, but also gives insight into the pitfalls of current research

The aim of study was to develop solid lipid nanoparticles containing bisdemethoxycurcumin using rice bran wax compared to glyceryl behenate and cetyl palmitate for pharmaceutical application. Rice bran wax is a by-product from rice bran oil refinery. It contains potent antioxidant of gamma oryzanol utilized in pharmaceuticals. Solid lipid nanoparticles (SLN) were prepared by high pressure homogenization technique using different type and amount concentration of lipid, and stabilized by tween 80. Type and concentration of lipids influenced the physicochemical properties of the SLN. RB-SLN had larger particle size than GB-SLN and CP-SLN. The higher the concentration of lipid, the larger was the particle size. Also, the higher the amount of tween 80 in SLN, the better was physical stability. Bisdemethoxycurcumin-loaded SLN (BDMC-SLN) appeared as a homogeneous dispersion with spherical shape in nanosize range. BDMC-SLN with RB had the largest particle size and the highest entrapment efficiency. In

vitro release study of the BDMC-SLN exhibited a sustained release pattern. Increasing the lipid concentration resulted in sustaining the BDMC released. BDMC-loaded solid lipid nanoparticles using rice bran wax was successfully prepared. This rice bran lipid carrier provided better physical properties, entrapment efficiency and stability.

Flutamide (FLT) is an anticancer agent used in the treatment of prostatic carcinoma. FLT amorphous solid dispersions (SDs) and solid lipid nanoparticles (SLNs) were prepared to overcome limited solubility. Investigation of drug-polymer and drug-lipid miscibility was carried out to enhance drug performance by assessing solubility and particle size. Miscibility was then correlated to performance to determine successful preparation of FLT SDs and SLNs. Four polymers used to prepare SDs included polyvinylpyrrolidone K90 (PVP), hydroxypropyl methylcellulose (HPMC), eudragit (EPO), and polyethylene glycol 8000 (PEG). Miscibility of drug and polymer at 90:10, 70:30, and 50:50 w/w (drug:polymer) was assessed through modulated differential scanning calorimetry (MDSC). FLT SDs were characterized by powder X-ray diffraction (PXRD). Molecular interactions were determined using infrared and Raman spectroscopy and molecular modeling using Jaguar. Polymer precipitation inhibition efficiency and dissolution studies were conducted at 0.1 mg/mL and 0.05 mg/mL (70:30

w/w). Glyceryl monooleate (GMO), Precirol® (glyceryl distearate, PRE), glyceryl monostearate (GMS) and COM® (glyceryl dibehenate, COM) were prepared with Gelucire (GEL) 44/14 or 50/13 as surfactant at 5:2 w/w (lipid:surfactant) and 2:1 w/w (FLT:lipids/surfactants). Miscibility of lipid and surfactant mixtures with and without FLT were investigated using MDSC. SLNs with and without drug-loading were prepared by ultrasonication and characterized for particle size. Drug-loaded SLNs were lyophilized and characterized in a similar manner. Miscibility between FLT-PVP and FLT-PEG was observed in MDSC results. PXRD indicated the formation of FLT-PVP amorphous SDs, while FLT-PEG formed a crystalline eutectic mixture. Molecular modeling studies confirmed potential interactions formed between FLT-PVP and FLT-PEG. PVP and PEG were shown to be the most efficient FLT precipitation inhibitors and displayed enhanced dissolution profiles. Miscibility between GMO and GMS with GEL 50/13 was observed in MDSC results in the presence or absence of FLT. The particle size of SLNs prepared from GMO and GMS was found to be 100 nm compared to 200 nm obtained from PRE and COM. Similar trends regarding particle size were seen upon lyophilization. Miscibility of FLT with polymers and lipids demonstrated enhanced performance suggesting FLT SDs and SLNs would result in increased solubility and bioavailability.

Skin Infection: New Insights for the Healthcare Professional / 2012 Edition is a ScholarlyBrief™ that delivers timely, authoritative, comprehensive, and specialized information about Skin Infection in a concise format. The editors have built Skin Infection: New Insights for the Healthcare Professional / 2012 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Skin Infection in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Skin Infection: New Insights for the Healthcare Professional / 2012 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/>.

Lipid-Based Nanostructures for Food Encapsulation Purposes, Volume Two in the Nanoencapsulation in the Food Industry series, reviews recent studies on the formulation and evaluation of different categories of lipid-based nano-carriers and discusses how lipid nanoencapsulation is a feasible technology for the food industry. This book covers nano-emulsions, nano-liposomes, nanostructured lipid

carriers and surfactant nanoparticles. Authored by a team of global experts in the fields of nano and microencapsulation of food, nutraceutical and pharmaceutical ingredients, this title is of great value to those engaged in the various fields of nanoencapsulation. Provides recent studies on the formulation and evaluation of different categories of lipid-based nanocarriers Discusses how technology of lipid nanoencapsulation can be used in industries Summarizes the practical application of nanostructures from lipid formulations, such as nanoemulsions, nanoliposomes and nanostructured lipid carriers

Biomedical Innovations to Combat COVID-19 provides an updated overview on the development of vaccines, antiviral drugs and nanomaterials, and diagnostic methods for the fight against COVID-19. Perspectives on such technologies are identified, discussed, and enriched with figures for easy understanding and applicability. Furthermore, it contains basic aspects of virology, immunology, and antiviral drugs that are needed to fully appreciate these innovations. This book is split into four sections: introduction, presenting basic virologic and epidemiological aspects of COVID-19; vaccines against COVID-19, discussing their different types and applications used to develop them; diagnostic approaches for SARS-CoV-2, encompassing advanced sensing and microfluidic-based biosensors; and drug development and delivery, where antivirals based on

nanomaterials or drugs are presented. It is a valuable source for virologists, biotechnologists, and members of biomedical field interested in learning more about how novel technologies can be applied to fasten the eradication of the COVID-19 and similar pandemics. Presents updated literature coverage summarizing the most relevant information on COVID-19 Written by experts from diverse scientific domains in order to provide readers with a thorough view on the subject Encompasses tables, figures and information trees especially developed for the book in order to condense and highlight key points for quick reference 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.

Advances in Nano-fertilizers and Nano-pesticides in Agriculture: A Smart Delivery System for Crop Improvement explores the use of nanotechnology for the controlled delivery of pesticides, herbicides and fertilizers that improve the safety of products while also increasing the efficiency of food production and decreased environmental pollution. The development of nanodevices such as smart delivery systems to target specific sites, as well as nanocarriers for chemical controlled

release are currently important aspects in novel agriculture and require a strong foundation of understanding, not only the technology, but also the resulting impacts. Fills key knowledge- gaps of bio-nanotechnology, how they interact with plant cells and their biological consequences Focuses on agro-nanotechnology which can be utilized for developing healthy seeds Explores the possibilities of macronutrient nano-based fertilizers

From a review of the previous edition: 'For all the pharmacy students out there part of your pharmacy degree will be to study formulation design and pharmaceuticals. This is the holy grail of pharmaceutical technology books. The text reads well and introduces difficult concepts in a more easy-to-understand way, it is definitely worth the money to help you get through the module, if you're doing a research project in pharmaceutical design then this would also be an excellent buy...This is essential for passing exams and developing professional competence.' This is the best known text on pharmaceuticals. Its strength lies mainly in being a complete course in one book. Reviewers consistently praise its comprehensiveness and its extremely high quality-quality content. Pharmaceuticals is one of the most diverse subject areas in pharmaceutical science and an understanding of it is vital for all pharmacists and scientists involved in converting drugs to medicines that can be safely delivered to a patient. The editorial and

author team deliver a tour de force of accessibility, coverage and currency in this new edition of a world-class textbook. Relevant chemistry covered throughout Reflects current and future use of biotechnology products throughout Covers ongoing changes in our understanding of biopharmaceutics, certain areas of drug delivery and the significance of the solid state Includes the science of formulation and drug delivery Designed and written for newcomers to the design of dosage forms Key points boxes throughout Summaries at the end of each chapter Fully updated throughout, with particular focus on delivery of biopharmaceuticals, nanotechnology and nanomedicines, parenteral and ocular drug delivery mechanisms. Now comes with online access on StudentConsult.

Nutraceuticals, the fourth volume in the Nanotechnology in the Agri-Food Industry series, is an invaluable resource for anyone in the food industry who needs the most current information about scientific advances in this field.

Nutraceuticals are gaining significant attention because of their apparent safety, as well as their nutritional and therapeutic uses. Scientific indications have reinforced dietary interposition as an effective implement for a healthy lifestyle. Bioactive components have been shown to exhibit antioxidant, anti-inflammatory, antimicrobial, hypocholesterolemic, hypoglycemic, anti-mutagenic, and anti-carcinogenic roles in the living system. Research professionals, professors, and

students will all find this book useful. Includes the most up-to-date research on nanotechniques and the applications most useful in the food industry Presents various natural and synthetic polymer-based nanoparticulate systems and their conjugates to the food industry including proteins, lipids, carbohydrates, and other biopolymers for applications Provides uses of nanoparticle uptake in ingredients as well as the potential side effects of nanoparticle carriers Covers potential benefits and methods of risk assessment for food safety

Characterization and Biology of Nanomaterials for Drug Delivery: Nanoscience and Nanotechnology in Drug Delivery describes the techniques successfully employed for the application of nanocarriers loaded with the antioxidant enzyme, catalase, and thus targeted to endothelial cells. Methods of nanocarrier synthesis, loading within various systems, and the characterization of nanocarriers for targeting activities are covered, as are their advantages, disadvantages and applications. Reflecting the interdisciplinary nature of the subject matter, this book includes contributions by experts from different fields, all with various backgrounds and expertise. It will appeal to researchers and students from different disciplines, such as materials science, technology and various biomedical fields. Enables readers from different fields to access recent research and protocols across traditional boundaries Focuses on protocols and

techniques, as well as the knowledge base of the field, thus enabling those in R&D to learn about, and successfully deploy, cutting-edge techniques Explores both current and emerging classes of nanomaterials, along with their fundamentals and applications

The search for better strategies to preserve foods with minimal changes during processing has been of great interest in recent decades. Traditionally, edible films and coatings have been used as a partial barrier to moisture, oxygen, and carbon dioxide through selective permeability to gases, as well as improving mechanical handling properties. The advances in this area have been breathtaking, and in fact their implementation in the industry is already a reality. Even so, there are still new developments in various fields and from various perspectives worth reporting. Edible Films and Coatings: Fundamentals and Applications discusses the newest generation of edible films and coatings that are being especially designed to allow the incorporation and/or controlled release of specific additives by means of nanoencapsulation, layer-by-layer assembly, and other promising technologies. Covering the latest novelties in research conducted in the field of edible packaging, it considers state-of-the-art innovations in coatings and films; novel applications, particularly in the design of gourmet foods; new advances in the incorporation of bioactive compounds; and

potential applications in agronomy, an as yet little explored area, which could provide considerable advances in the preservation and quality of foods in the field.

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