Drug Delivery Strategies For Poorly Water Soluble Drugs Advances In Pharmaceutical Technology

Drug Delivery Strategies for Poorly Water-Soluble Drugs-Dionysios Douroumis 2012-12-19 Many newly proposed drugs suffer from poor water solubility, thus presenting major hurdles in the design of suitable formulations for administration to patients. Consequently, the development of techniques and materials to overcome these hurdles is a major area of research in pharmaceutical companies. Drug Delivery Strategies for Poorly Water-Soluble Drugs provides a comprehensive overview of currently used formulation strategies for hydrophobic drugs, including liposome formulation, cyclodextrin drug carriers, solid lipid nanoparticles, polymeric drug encapsulation delivery systems, self-microemulsifying drug-delivery systems, nanocrystals, hydrophilic colloidal dispersions, microemulsions, solid dispersions, cosolvent use, dendrimers, polymer drug conjugates, polymeric micelles, and mesoporous silicnanoparticles. For each approach the book discusses the main instrumentation, operation principles and theoretical background, with a focus on critical formulation features and clinical studies. Finally, the book includes some recent and novel applications, scale-up considerations and regulatory issues. Drug Delivery Strategies for Poorly Water-Soluble Drugs is an essential multidisciplinary guide to this important area of drug formulation for researchers in industry and academia working in drug delivery, polymers and biomaterials.

Innovative Dosage Forms-Yogeshwar Bachhav 2019-10-28 Teaches future and current drug developers the latest innovations in drug formulation design and optimization. This highly accessible, practice-oriented book examines current approaches in the development of drug formulations for preclinical and clinical studies, including the use of functional excipients to enhance solubility and stability. It covers oral, intravenous, topical, and parenteral administration routes. The book also discusses safety aspects of drugs and excipients, as well as regulatory issues relevant to formulation. Innovative Dosage Forms: Design and Development at Early Stage starts with a look at the impact of the polymorphic form of drugs on the preformulation and formulation development. It then offers readers reliable strategies for the formulation development of poorly soluble drugs. The book also studies the role of reactive impurities from the excipients on the formulation shelf life; preclinical formulation assessment of new chemical entities; and regulatory aspects for formulation design. Other chapters cover innovative formulations for special indications, including oncology injectables, delayed release and depot formulations; accessing pharmacokinetics of various dosage forms; physical characterization techniques to assess amorphous nature; novel formulations for protein oral dosage; and more. Provides information that is essential for the drug development effort. Presents the latest advances in the field and describes in detail innovative formulations, such as nanosuspensions, micelles, and cocrystals. Describes current approaches in early pre-formulation to achieve the best in vivo results. Addresses regulatory and safety aspects, which are key considerations for pharmaceutical companies. Includes case studies from recent drug development programs to illustrate the practical challenges of preformulation design. Innovative Dosage Forms: Design and Development at Early Stage provides valuable benefits to interdisciplinary drug discovery teams working in industry and academia and will appeal to medicinal chemists, pharmaceutical chemists, and pharmacologists.

Pulmonary Drug Delivery-Ali Nokhodchi 2015-08-03 Drug therapy via inhalation route is at the cutting edge of modern drug delivery research. There has been significant progress on the understanding of drug therapy via inhalation products. However, there are still problems associated with their formulation design, including the interaction between the active pharmaceutical ingredient(s) (APIs), excipients, and devices. This book seeks to cover some of the most pertinent issues and challenges of such formulation design associated with industrial production and desirable clinical outcome. The chapter topics have been selected with a view to integrating the factors that require consideration in the selection and design of device and formulation components which impact upon patient usability and clinical effectiveness. The challenges involved with the delivery of macromolecules by inhalation to both adult and pediatric patients are also covered. Written by leading international experts from both academia and industry, the book will help readers (formulation design scientists, researchers and post-graduate and specialized undergraduate students) develop a deep understanding of key aspects of inhalation formulations as well as detail ongoing challenges and advances associated with their development.

NanoFormulation-Gordon J. T. Tiddy 2012 NanoFormulation covers advances in research, development and applications of innovative formulation technologies where nanomaterials play an essential role.

Multifunctional Systems for Combined Delivery, Biosensing and Diagnostics-Alexandru Mihai Grumezescu 2017-05-03 Multifunctional Systems for Combined Delivery, Biosensing, and Diagnostics explores how multifunctional nanocarriers are being used in combined delivery and diagnostics in contemporary medicine. Particular attention is given to efforts to i) reduce the side effects of therapeutic agents, ii) increase the pharmacological effect, and iii) improve aqueous solubility and chemical stability of different therapeutic agents. The chapters focus on applications of nanostructured materials and nanocarriers, highlighting how these can be used effectively in both diagnosis and delivery. This applied focus makes the book an important reference source for those wanting to learn more about how specific nanomaterials and nanotechnology systems can help to solve drug delivery and diagnostics problems. This book is a valuable resource for materials scientists, bioengineers, and medical researchers who are looking for an applications-oriented guide on how nanotechnology and nanomaterials can be used effectively throughout the medical treatment process, from diagnosis to treatment. Explores the benefits of using a variety of nanomaterials as drug delivery agents Explains how nanocarriers can reduce the side effects of therapeutic agents Provides an analysis of the pros and cons of using specific nanocarriers to solve particular diagnosis and delivery problems.
**Drug Delivery Aspects**

Ranjita Shergollar 2020-04-10 Drug Delivery Aspects: Expectations and Realities of Multifunctional Drug Delivery Systems examines the fabrication, optimization, and scale-up of nano and micro carriers. Various aspects like conversion of micro-nano particles into solid dosage form, large scale industry manufacturing challenges of nanocarriers, regulatory considerations on drug device combinations are featured in this volume. Written by a diverse range of international researchers from industry and academia, the chapters examine specific aspects of characterization and manufacturing for pharmaceutical applications as well as regulatory and policy aspects. The Multifunctional Drug Delivery Systems books provide a platform to discuss opportunities and challenges in development of micro-nanomedicine and other drug delivery systems, review industrial manufacturing challenges, discuss current and future market trends, facilitate the insight sharing within various expertise area, and establish collaborations between academic scientists, industrial and clinical researchers. This book connects formulation scientists, regulatory experts, engineers, clinical experts and regulatory stake holders. The wide scope of the book ensures it is a valuable reference resource for researchers in both academia and the pharmaceutical industry who want to learn more about the status of drug delivery systems.

**Lipid-Based Nano-Delivery for Oral Administration of Poorly Water Soluble Drugs (PWSDs): Design, Optimization and in Vitro Assessment**

Mohsin Kazi 2017 Currently, more than 90% of compounds identified are water insoluble and or poorly water soluble, which is a bottle neck in the development of many new drug candidates. These poorly soluble drug molecules are difficult to formulate using conventional approaches and are associated with numerous formulation-related performance issues. Formulating these compounds using lipid-based systems is one of the rapidly growing interests and suitable drug delivery strategies. Lipid formulations such as self-emulsifying/microemulsifying/nanoemulsifying drug delivery systems (SEDDS/SMEDDS/SNEDDS) have been attempted in many researches to improve the bioavailability and dissolution rate for their better dispersion properties. One of the greatest advantages of incorporating the poorly soluble drug into such formulation products is their spontaneous emulsion and or microemulsion/nanoemulsion formation in aqueous media. The performance and ongoing advances in manufacturing technologies have rapidly introduced lipid-based drug formulations as commercial products into the marketplace with several others in clinical development. The current chapter aims to present the characteristics feature, development and utilization of oral lipid-based nanoformulations within the drug delivery regime. The content also provides an insight into the in vitro evaluation of lipid-based nanosystems and their limitations.

**Oral Lipid-Based Formulations**

David J. Hauss 2007-06-08 Oral lipid-based formulations are attracting considerable attention due to their capacity to facilitate gastrointestinal absorption and reduce or eliminate the effect of food on the absorption of poorly water-soluble, lipophilic drugs. Despite the obvious and demonstrated utility of these formulations for addressing a persistent and growing problem

**Advanced Drug Delivery Systems in the Management of Cancer**

Kamal Dua 2021-06-24 Advanced Drug Delivery Systems in the Management of Cancer discusses recent developments in nanomedicine and nano-based drug delivery systems used in the treatment of cancers affecting the blood, lungs, brain, and kidneys. The research presented in this book includes international collaborations in the area of novel drug delivery for the treatment of cancer. Cancer therapy remains one of the greatest challenges in modern medicine, as successful treatment requires the elimination of malignant cells that are closely related to normal cells within the body. Advanced drug delivery systems are carriers for a wide range of pharmacotherapies used in many applications, including cancer treatment. The use of such carrier systems in cancer treatment is growing rapidly as they help overcome the limitations associated with conventional drug delivery systems. Some of the conventional limitations that these advanced drug delivery systems help overcome include nonspecific targeting, systemic toxicity, poor oral bioavailability, reduced efficacy, and low therapeutic index. This book begins with a brief introduction to cancer biology. This is followed by an overview of the current landscape in pharmacotherapy for the cancer management. The need for advanced drug delivery systems in oncology and cancer treatment is established, and the systems that can be used for several specific cancers are discussed. Several chapters of the book are devoted to discussing the latest technologies and advances in nanotechnology. These include practical solutions on how to design a more effective nanocarrier for the drugs used in cancer therapeutics. Each chapter is written with the goal of informing readers about the latest advancements in drug delivery system technologies while reinforcing understanding through various detailed tables, figures, and illustrations. Advanced Drug Delivery Systems in the Management of Cancer is a valuable resource for anyone working in the fields of cancer biology and drug delivery, whether in academia, research, or industry. The book will be especially useful for researchers in drug formulation and drug delivery as well as for biological and translational researchers working in the field of cancer. Presents an overview of the recent perspectives and challenges
within the management and diagnosis of cancer Provides insights into how advanced drug delivery systems can effectively be used in the management of a wide range of cancers Includes up-to-date information on diagnostic methods and treatment strategies using controlled drug delivery systems

**Modeling and Control of Drug Delivery Systems**-Ahmad Taher Azar 2021-02-15 Modeling and Control of Drug Delivery Systems provides comprehensive coverage of various drug delivery and targeting systems and their state-of-the-art related works, ranging from theory to real-world deployment and future perspectives. Various drug delivery and targeting systems have been developed to minimize drug degradation and adverse effect and increase drug bioavailability. Site-specific drug delivery may be either an active and/or passive process. Improving delivery techniques that minimize toxicity and increase efficacy offer significant potential benefits to patients and open up new markets for pharmaceutical companies. This book will attract many researchers working in DDS field as it provides an essential source of information for pharmaceutical scientists and pharmacologists working in academia as well as in the industry. In addition, it has useful information for pharmaceutical physicians and scientists in many disciplines involved in developing DDS, such as chemical engineering, biomedical engineering, protein engineering, gene therapy. Presents some of the latest innovations of approaches to DDS from dynamic controlled drug delivery, modeling, system analysis, optimization, control and monitoring Provides a unique, recent and comprehensive reference on DDS with the focus on cutting-edge technologies and the latest research trends in the area Covers the most recent works, in particular, the challenging areas related to modeling and control techniques applied to DDS

**Dendrimer-Based Nanotherapeutics**-Prashant Kesharwani 2021-04-27 Dendrimer-Based Nanotherapeutics delivers a comprehensive resource on the use of dendrimer-based drug delivery. Advances in the application of nanotechnology in medicine have given rise to multifunctional smart nanocarriers that can be engineered with tunable physicochemical characteristics to deliver one or more therapeutic agent(s) safely and selectively to cancer cells, including intracellular organelle-specific targeting. This book compiles the contribution of dendrimers in the field of nanotechnology to aid researchers in exploring dendrimers in the field of drug delivery and related applications. This book covers the history of the area to the most recent research. The starting chapter covers detailed information about basic properties about dendrimers i.e. properties, nomenclature, synthesis methods, types, characterization of dendrimers, safety and toxicity issues of dendrimers. Further chapters discuss the most recent advancements in the field of dendrimer i.e. dendrimer-drug conjugates, PEGylated dendrimer, dendrimer surface engineering, dendrimer hybrids, dendrimers as solubility enhancement, in targeting and delivery of drugs, as photodynamic therapy, in tissue engineering, as imaging contrast agents, as antimicrobial agents, advances in targeted dendrimers for cancer therapy and future considerations of dendrimers. Dendrimer-Based Nanotherapeutics will help the readers to understand the most recent progress in the field of dendrimer-based research, suitable for pharmaceutical scientists, advanced students, and those working in related healthcare fields. Discusses various routes such as oral, pulmonary, transdermal, delivery and local administration of dendrimer delivery of bioactive Explores a wide range of applications of dendrimer-based drug delivery using the latest advancements in nanomedicine Provides the most recent research on dendrimers as well as context and background, providing a useful resource for all levels of researcher

**Drug Targeting and Stimuli Sensitive Drug Delivery Systems**-Alexandru Mihai Grumezescu 2018-05-21 Drug Targeting and Stimuli Sensitive Drug Delivery Systems covers recent advances in the area of stimuli sensitive drug delivery systems, providing an up-to-date overview of the physical, chemical, biological and multistimuli-responsive nanosystems. In addition, the book presents an analysis of clinical status for different types of nanoplatforms. Written by an internationally diverse group of researchers, it is an important reference resource for both biomaterials scientists and those working in the pharmaceutical industry who are looking to help create more effective drug delivery systems. Shows how the use of nanomaterials can help target a drug to specific tissues and cells Explores the development of stimuli-responsive drug delivery systems Includes case studies to showcase how stimuli responsive nanosystems are used in a variety of therapies, including camptothecin delivery, diabetes and cancer therapy

**Advanced Drug Delivery**-Ashmit Mitra 2013-08-26 Provides both fundamentals and new and emerging applications Advanced Drug Delivery brings readers fully up to date with the state of the science, presenting the basics, formulationstrategies, and therapeutic applications of advanced drug delivery. The book demonstrates how core concepts of pharmaceutical sciences, chemistry, and molecular biology can be combined and applied in order to spark novel ideas to design and develop advanced drugdelivery systems for the treatment of a broad range of diseases. Advanced Drug Delivery features contributions from an international team of pharmaceutical scientists. Chapters reflect a thorough review and analysis of the literature as well as the authors' firsthand experience developing drug delivery systems. The book is divided into four parts: Part I, Introduction and Basics of Advanced DrugDelivery, explores physiological barriers, stability, transporters, and biomaterials in drug delivery Part II, Strategies for Advanced Drug Delivery, offers tested and proven strategies for advanced delivery of both smallmolecules and macromolecules Part III, Translational Research of Advanced Drug Delivery, focuses on regulatory considerations and translational applications of advanced drug delivery systems for the treatment of cardiovascular diseases, cancer, sexually transmitted diseases, ophthalmic diseases, and brain diseases Part IV, Future Applications of Advanced Drug Delivery in Emerging Research Areas, examines how drug delivery systems can effectively be used in the management of a wide range of cancers Includes up-to-date information on diagnostic methods and treatment strategies using controlled drug delivery systems. Since the advent of analytical techniques and capabilities to measure particle sizes in nanometer ranges, there has been tremendous interest in the use of...
nanoparticles for more efficient methods of drug delivery. On the other hand, this reference discusses advances in the design, optimization, and adaptation of gene delivery systems for the treatment of cancer, cardiovascular, diabetic, genetic, and infectious diseases, and considers assessment and review procedures involved in the development of gene-based pharmaceuticals.

**Novel Drug Delivery Technologies**-Ambikanandan Misra 2020-02-12 The application of drug delivery is a valuable, cost-effective lifecycle management resource. By endowing drugs with new and innovative therapeutic benefits, drug delivery systems extend products’ profitable lifecycle, giving pharmaceutical companies competitive and financial advantages, and providing patients with improved medications. Formulation development is now being used to create new dosage forms for existing products, which not only reduces the time and expense involved in new drug development, but also helps with regard to patent protection and bypassing existing patents. Today’s culture demands convenience, a major factor determining adherence to drug therapy. Over the past few years, patient convenience-oriented research in the field of drug delivery has yielded a range of innovative drug-delivery options. As a result, various drug-delivery systems, including medicated chewing gums, oral dispersible tablets, medicated lozenges and lollipops, have now hit the market and are very popular. These dosage forms offer a highly convenient way to dose medications, not only for special population groups with swallowing difficulties, such as children and the elderly, but for the general populace as well. This book provides valuable insights into a number of formulation design approaches that are currently being used, or could be used, to provide new benefits from existing drug molecules.

**Advances and Challenges in Pharmaceutical Technology**-Amit Kumar Nayak 2021-02-19 Advances and Challenges in Pharmaceutical Technology: Materials, Process Development and Drug Delivery Strategies examines recent advancements in pharmaceutical technology. The book discusses common formulation strategies, including the use of tools for statistical formulation optimization, Quality by design (QbD), process analytical technology, and the uses of various pharmaceutical biomaterials, including natural polymers, synthetic polymers, modified natural polymers, bioceramics, and other bioinorganics. In addition, the book covers rapid advancements in the field by providing a thorough understanding of pharmaceutical processes, formulation developments, explorations, and exploitation of various pharmaceutical biomaterials to formulate pharmaceutical dosage forms. Provides extensive information and analysis on recent advancements in the field of pharmaceutical technology. Includes contributions from global leaders and experts in academia, industry and regulatory agencies. Uses high quality illustrations, flow charts and tables to explain concepts and text to readers, along with practical examples and research case studies.

**Drug Delivery Applications of Noninvasive Imaging**-Chun Li 2013-10-14 Cost-effective strategies for designing novel drug delivery systems that target a broad range of disease conditions. In vivo imaging has become an important tool for the development of new drug delivery systems, shedding new light on the pharmacokinetics, biodistribution, bioavailability, local concentration, and clearance of drug substances for the treatment of human disease, most notably cancer. Written by a team of international experts, this book examines the use of quantitative imaging techniques in designing and evaluating novel drug delivery systems and applications. Drug Delivery Applications of Noninvasive Imaging offers a full arsenal of tested and proven methods, practices and guidance, enabling readers to overcome the many challenges increasing successful new drug delivery systems. The book begins within introduction to molecular imaging. Next, it covers: In vivo imaging techniques and quantitative analysis Imaging Drugs and Drug Carriers at the site of action, including low-molecular weight radiopharmaceuticals, peptides and proteins, siRNA, cells, and nanoparticles Applications of imaging techniques in administration routes other than intravenous injection, such as pulmonary and oral delivery. Translational research leading to clinical applications. Imaging drug delivery in large animal models. Clinical applications of imaging techniques to guide drug development and drug delivery. Chapters are based on a thorough review of the current literature as well as the authors' firsthand experience working with imaging techniques for the development of novel drug delivery systems. Presenting state-of-the-art technology applications of imaging in preclinical and clinical evaluation of drug delivery systems. Drug Delivery Applications of Noninvasive Imaging offers cost-effective strategies to pharmaceutical researchers and students developing novel drug delivery systems. Accurately target a broad range of disease conditions.

**Patenting Nanomedicines**-Eliana B. Souto 2012-07-06 “Patenting Nanomedicines: Legal Aspects, Intellectual Property and Grant Opportunities” focuses on the fundamental aspects of Patenting Nanomedicines applied in different “Drug Delivery and Targeting Systems”. The promoters of new findings in this field of research are numerous and spread worldwide; therefore, managing intellectual property portfolios, and the acquisition and exploitation of new knowledge face several contingency factors. Today, the scientific community is discussing issues of economic outcomes in the field of Nanomedicines. Major concerns include questions as to whether the research groups, academics, industry and other stakeholders should work in unison or independently, if innovation or adaptation of new technology should be prioritized, public versus private research funding, and safeguarding versus sharing knowledge. However, despite its increasing importance for humankind, it is a matter of concern as to whether technological development can really be stimulated by patent protection. An intellectual property strategy should aim to develop a qualitative patent portfolio for continuous learning. This book addresses questions of ethics, socio-political policies and regulatory aspects of novel Nanomedicine-based products which are currently under development for the diagnosis and treatment of different types of diseases. It is divided in two parts – Part I is composed of the first 3 chapters, which focus on the “fundamentals” of legal aspects, emerging threats, advantages and disadvantages of patenting Nanomedicines, whereas Part II collects 12 chapters discussing different types of Nanomedicine-based products, their potential marketing aspects and patent protection. Whenever applicable, each chapter offers a list of patents, based on a specific application in drug delivery and targeting. An outstanding team of 53 authors have contributed to this book, which will be of interest to professionals from the field of patent examiners, academics, researchers and scientists, students and other practitioners.

**Nanoparticles in Life Sciences and Biomedicine**-Ana Rute Neves 2018-02-13 The creation of new and more efficient therapies for improving human health greatly depends on drug delivery systems. Nanotechnology has emerged as a powerful strategy for the...
development of nanoparticles, such as nanoemulsions, liposomes, nanocrystals, and nanocomplexes, applied in the diagnosis, treatment, or theranostics of several pathologies and diseases. This book reviews the most recent research and development in nanotechnology and, following a multidisciplinary approach, presents new strategies for drug delivery, including aspects from chemistry, physics, biology, and imaging methodologies and exploiting several administration routes, internalization pathways, site-specific delivery strategies, and the potential cytotoxicity of nanoparticles. Beginning with a description of the importance and application of nanotechnology for enhancing existing therapy, the book moves on to detailing oral, topical, pulmonary, brain, cancer, and anti-inflammatory drug delivery approaches; gene delivery approaches; theranostic approaches; and nanoparticle cytotoxicity. Practical and user friendly, it is suitable for advanced undergraduate, graduate, and postgraduate students of nanoscience and nanotechnology; researchers in nanoscience, nanotechnology, chemistry, biology, biochemistry, pharmaceutical sciences, medicine, and bioengineering, especially those with an interest in drug delivery or theranostics; and academia and university readership.

Stimuli-responsive Drug Delivery Systems-Amit Singh 2018-07-09 The increased understanding of molecular aspects associated with chronic diseases, such as cancer and the role of tumor microenvironment, has led to the identification of endogenous and exogenous stimuli that can be exploited to devise “stimuli-responsive” materials for site-specific drug delivery applications. This book provides a comprehensive account on the design, materials chemistry, and application aspects behind these novel stimuli-responsive materials. Setting the scene, the editors open with a chapter addressing the need for smart materials in delivery applications for therapy, imaging and disease diagnosis. The following chapter describes the key physical and chemical aspects of smart materials, from lipids to polymers to hybrid materials, providing the reader with a springboard to delve into the more application oriented chapters that follow. With in-depth coverage of key drug delivery systems such as pH-responsive, temperature responsive, enzyme-responsive and light responsive systems, this book provides a rigorous foundation to the field. A perfect resource for graduate students and newcomers, the closing chapter on regulatory and commercialization challenges also makes the book ideal for those wanting to take the next step towards clinical translation.

Nanoparticulate Drug Delivery Systems-Yoon Yeo 2013-02-25 Frank discussions of opportunities and challenges point the way to new, more effective drug delivery systems. Interest in nanomedicine has grown tremendously, fueled by the expectation that continued research will lead to the safe, efficient, and cost-effective delivery of drugs or imaging agents to human tissues and organs. The field, however, has faced several challenges attempting to translate novel ideas into clinical benefits. With contributions from an international team of leading nanomedicine researchers, this book provides a practical assessment of the possibilities and the challenges of modern nanomedicine that will enable the development of clinically effective nanoparticulate drug delivery products and systems. Nanoparticulate Drug Delivery Systems focuses on the rationales and preclinical evaluation of new nanoparticulate drug carriers that have yet to be thoroughly reviewed in the literature. The first chapter sets the stage with a general overview of targeted nanomedicine. The book then explores new and promising nanoparticulate drug delivery systems, including: Lipid nanoparticles for the delivery of nucleic acids Multifunctional dendritic nanocarriers Polymer drug nanoconjugates Next, the book presents new opportunities and challenges for nanoparticulate drug delivery systems, including: Clearance of nanoparticles during circulation Drug delivery strategies for combating multiple drug resistance Toxicological assessment of nanomedicine Chapters offer state-of-the-technology reviews with extensive references to facilitate further investigation. Moreover, each chapter concludes with an expert assessment of remaining challenges, pointing the way to solutions and new avenues of research. With its frank discussions of opportunities and challenges, Nanoparticulate Drug Delivery Systems sets a solid foundation for new research leading to the discovery and development of better nanomedicines.

Mucosal Delivery of Biopharmaceuticals-José das Neves 2014-02-03 Biopharmaceutical medicines, the newest class of therapeutics, are quite heterogeneous and include a range of molecules such as proteins, peptides, vaccines and nucleic acids, with use in virtually all therapeutic fields (e.g. cancer and infectious diseases, vaccination, metabolic dysfunctions) and diagnostics. This edited book gives a concise and up-to-date overview of the biological features justifying the use of different human mucosa as delivery routes for biopharmaceuticals, the technological strategies that have been followed so far regarding the optimization of mucosal potentialities as well as the challenges that arise with the advent of new biopharmaceutical drugs and alternative means of administration. Following a brief introduction, the first section addresses general aspects of the biology of mucosal tissues and their unique aspects toward beneficial or deleterious interaction with biopharmaceuticals and their delivery systems. The second part reviews the different delivery strategies that have recently been investigated for different mucosal sites. The third section describes the development and clinical applications of drug delivery systems and products enclosing biopharmaceuticals for mucosal delivery, with a focus on the most successful case studies of recent years. The last section briefly centers on relevant aspects of the regulatory, toxicological and market issues of mucosal delivery of biopharmaceuticals. Scientists and researchers in the fields of drug delivery, material science, biomedical science and bioengineering as well as professionals, regulators and policy makers in the pharmaceutical, biotechnology and healthcare industries will find in this book an important compendium of fundamental concepts and practical tools for their daily research and activities.

Drug Delivery Systems-Stroeve Pieter 2017-11-27 With the alarming increase in cancer diagnoses and genetic illnesses, traditional drug agents and their delivery media need to be re-evaluated to address a quickly evolving field. With newer smart materials for the controlled release of macromolecules, peptides, genetic material, etc. further complications arise, such as material performance, synthesis, functionalization and targeting, biological identity, and biocompatibility. The book provides a comprehensive overview of the recent developments on “smart” targeting and drug delivery systems with a variety of carriers like nanoparticles, membranes, and hydrogels. It contains detailed descriptions on the recent trends in this field in the ongoing battle with catastrophic diseases like cancer. This field of research has been in its infancy and continues to face growth, and with it, further challenges and difficulties along the way toward maturity, which are accurately introduced in this book. Contents: Drug Delivery Systems: Possibilities and Challenges (Ryan Spitzer, Saeid Zanganeh, Tahereh Jafari, Nasser Khakpash, Mohsen Erkanzadeh, Jim Q Ho, and Nastaran Sakhaie) Nanoparticles in...
Circulation: Blood Stability (Saeid Zanganeh, Tahereh Safari, Nasser Khakpash, Mohsen Erfanzadeh, and Jim Q Ho)

How do Nanoparticles (NPs) Pass Barriers? (Saeid Zanganeh, Ryan Spitler, Najme Javdani, and Jim Q Ho)

Gated Porous Materials for Biomedical Application (Félix Sancenón, Erick Yu, Elena Aznar, M Dolores Marcos, and Ramón Martínez-Máñez)

Controlled Release from Iron Oxide Nanoparticles (Masoud Rahman)

The Reverse of Controlled Release: Controlled Sequestration of Species and Biotoxins into Nanoparticles (NPs) (Jenifer Gómez-Pastora, Eugenio Bringas, María Lázaro-Diez, José Ramos-Vivas, and Inmaculada Ortiz)

Membranes for Controlled Release (Vida Arahan, Neda Asliankooi, and Mohammad Raoufi)

Controlled Released from Hydrogel (Hossein Riahienezhad, Vida Arahan, and Mohammad Raoufi)

Nano Delivery Systems (Sophie Laurent, Alsraneh Lahooti, Saeed Shanelshazad, and Robert N Muller)

Legal Framework for Protection of Pharmaceutical Trade Marks in Europe and USA (Mohammad Hossein Erfamanesh, and Shirin Sharifzadeh)

Future Sharifzadeh on the Smart Delivery of Biomolecules (Erick Yu, Félix Sancenón, Elena Aznar, Ramón Martínez-Máñez, Maria Dolores Marcos, Mohammad J Hajipour, Morteza Mahmoudi, and Pieter Stroeve)

Readership: Nanotechnologists; biomedical engineers; chemical engineers; materials scientists; biotechnology researchers; chemists; biological scientists; cell physiologists; medical scientists; gene therapists.

Keywords: Drug Delivery Systems; Nanoparticles; Biomaterials; Targeting

Review: Key Features: Comprehensive overview on "smart" targeting and drug delivery systems.

Understanding of the biological identity of nanoparticles for drug delivery applications.

Detailed information on the legal framework for protection of pharmaceutical trade mark in Europe and the United States.

Formulating Poorly Water Soluble Drugs: Robert O. Williams III 2011-12-04

This volume is intended to provide the reader with a breadth of understanding regarding the many challenges faced with the formulation of poorly water-soluble drugs as well as in-depth knowledge in the critical areas of development with these compounds. Further, this book is designed to provide practical guidance for overcoming formulation challenges toward the end goal of improving drug therapies with poorly water-soluble drugs. Enhancing solubility via formulation intervention is a unique opportunity in which formulation scientists can enable drug therapies by creating viable medicines from seemingly undeliverable molecules. With the ever-increasing number of poorly water-soluble compounds entering development, the role of the formulation scientist is growing in importance. Also, knowledge of the advanced analytical, formulation, and process technologies as well as specific regulatory considerations related to the formulation of these compounds is increasing in value. Ideally, this book will serve as a useful tool in the education of current and future generations of scientists, and in this context contribute toward providing patients with new and better medicines.

Poorly Soluble Drugs: Gregory K. Webster 2017-01-06

This book is the first text to provide a comprehensive assessment of the application of fundamental principles of dissolution and drug release testing to poorly soluble compounds and formulations. Such drug products are, vis-à-vis their physical and chemical properties, inherently incompatible with aqueous dissolution. However, dissolution methods are required for product development and selection, as well as for the fulfillment of regulatory obligations with respect to biopharmaceutical assessment and product quality understanding. The percentage of poorly soluble drugs, defined in classes 2 and 4 of the Biopharmaceutics Classification System (BCS), has significantly increased in the modern pharmaceutical development pipeline. This book provides a thorough exposition of general method development strategies for such drugs, including instrumentation and media selection, the use of compendial and non-compendial techniques in product development, and phase-appropriate approaches to dissolution development. Emerging topics in the field of dissolution are also discussed, including biorelevant and biphasic dissolution, the use on enzymes in dissolution testing, dissolution of suspensions, and drug release of non-oral products. Of particular interest to the industrial pharmaceutical professional, a brief overview of the formulation and solubilization techniques employed in the development of BCS class 2 and 4 drugs to overcome solubility challenges is provided and is complemented by a collection of chapters that survey the approaches and considerations in developing dissolution methodologies for enabling drug delivery technologies, including nanosuspensions, lipid-based formulations, and stabilized amorphous drug formulations.

Polysaccharide Carriers for Drug Delivery: Sabyasachi Maiti 2019-06-14

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 and considerations in developing dissolution methodologies for enabling drug delivery technologies, including nanosuspensions, lipid-based formulations, and stabilized amorphous drug formulations.

6th International Conference on the Development of Biomedical Engineering in Vietnam (BME6): Toi Vo Van 2017-09-21

Under the motto “Healthcare Technology for Developing Countries” this book publishes many topics which are crucial for the health care systems in upcoming countries. The topics include Cyber Medical Systems Medical Instrumentation Nanomedicine and Drug Delivery Systems Public Health Entrepreneurship.

This proceedings volume offers the scientific results of the 6th International Conference on the Development of Biomedical Engineering in Vietnam, held in June 2016 at Ho Chi Minh City.

Advanced Technology for Delivering Therapeutics: Sabyasachi Maiti 2017-05-11

The goal of any novel drug delivery system is to provide therapeutic benefits to the patients by increasing duration of drug action, reducing dosing frequency, and controlling drug release rate at the target site, thereby reducing unwanted side effects. Advanced Technology for Delivering Therapeutics is a reference book that covers recent developments in the field of drug delivery science and technology. The purpose of this book is to bring together descriptions of some selective technologies including new and promising nanotechnology currently being investigated for drug delivery applications. This book is a useful source of information for graduate and post-graduate students of pharmacy and biomedical science; pharmaceutical
Nanoparticulate Drug Delivery Systems-Deepak Thassu 2007-03-30 With the advent of analytical techniques and capabilities to measure particle sizes in nanometer ranges, there has been tremendous interest in the use of nanoparticles for more efficient methods of drug delivery. Nanoparticulate Drug Delivery Systems addresses the scientific methodologies, formulation, processing, applications, recent trends, and e

Application of Nanotechnology in Drug Delivery-Ali Demir Sezer 2014-07-25 This book collects reviews and original articles from eminent experts working in the interdisciplinary arena of nanotechnology use in drug delivery. From their direct and recent experience, the readers can achieve a wide vision on the new and ongoing potentialities of nanotechnology application of drug delivery. Since the advent of analytical techniques and capabilities to measure particle sizes in nanometer ranges, there has been tremendous interest in the use of nanoparticles for more efficient methods of drug delivery. On the other hand, this reference discusses advances in design, optimization, and adaptation of gene delivery systems for the treatment of cancer, cardiovascular, pulmonary, genetic, and infectious diseases, and considers assessment and review procedures involved in the development of gene-based pharmaceuticals.

Water-Insoluble Drug Formulation-Ron Liu 2008-01-18 Scientists have attributed more than 40 percent of the failures in new drug development to poor biopharmaceutical properties, particularly water insolubility. Issues surrounding water insolubility can postpone, or completely derail, important new drug development. Even much-needed reformulation of currently marketed products can be significantly affected by these challenges. Water Insolubility is the Primary Culprit in over 40% of New Drug Development Failures The most comprehensive resource on the topic, this second edition of Water Insoluble Drug Formulation brings together a distinguished team of experts to provide the scientific background and step-by-step guidance needed to deal with solubility issues in drug development. Twenty-three chapters systematically describe solubility properties and their impact on formulation, from theory to industrial practice. With detailed discussion on how these properties contribute to solubilization and dissolution, the text also features six brand new chapters on water-insoluble drugs, exploring regulatory aspects, pharmacokinetic behavior, early phase formulation strategies, lipid based systems for oral delivery, modified release of insoluble drugs, and scalable manufacturing aspects. The book includes more than 15 water-insoluble drug delivery systems or technologies, illustrated with case studies featuring oral and parenteral applications. Highlighting the most current information and data available, this seminal volume reflects the significant progress that has been made in nearly all aspects of this field.

Drug Discovery and Development-Omboon Vallsuta 2015-06-03 It is very important for scientists all over the globe to enhance drug discovery research for better human health. This book demonstrates that various expertise are essential for drug discovery including synthetic or natural drugs, clinical pharmacology, receptor identification, drug metabolism, pharmacodynamic and pharmacokinetic research. The following 5 sections cover diverse chapter topics in drug discovery: Natural Products as Sources of Leading Molecules in Drug Discovery; Oncology and Drug Discovery; Receptors Involvement in Drug Discovery; Management and Development of Drugs against Infectious Diseases; Advanced Methodology.

Drug Delivery in Oncology-Felix Kratz 2013-09-30 In this first authoritative overview on modern cancer chemotherapy 121 international specialists have contributed their experience and recent data for what is likely to become the gold standard in the field. The authors summarize knowledge gained over the past decade, from basic concepts to successful applications in the clinic, covering active and passive targeting strategies as well as tissue-specific approaches. All current and future targeted delivery systems are discussed, from ligand-based to antibody-based polymer-based systems, right up to micro- and nanoparticulate systems. A special section covers the delivery of nucleic acid therapeutics, such as siRNA, miRNA and antisense nucleotides. In each case, a description of the basic technique is followed by a discussion of the latest preclinical and clinical developments in the field. By virtue of its clear and didactic structure, rich illustrative material and summary chapters, this handbook and ready reference enables the efficient transfer of knowledge between different disciplines, from basic research to the clinician and vice versa. It is equally well suited for professionals, researchers and students in medical oncology and cancer biology, and is also excellent for teaching medical students the foundations of 21st century cancer chemotherapy.

Recent Advances in Novel Drug Carrier Systems-Ali Demir Sezer 2012-10-31 This contribution book collects reviews and original articles from eminent experts working in the interdisciplinary arena of novel drug delivery systems and their uses. From their direct and recent experience, the readers can achieve a wide vision on the new and ongoing potentialities of different drug delivery systems. Since the advent of analytical techniques and capabilities to measure particle sizes in nanometer ranges, there has been tremendous interest in the use of nanoparticles for more efficient methods of drug delivery. On the other hand, this reference discusses advances in the design, optimization, and adaptation of gene delivery systems for the treatment of cancer, cardiovascular, pulmonary, genetic, and infectious diseases, and considers assessment and review procedures involved in the development of gene-based pharmaceuticals.

Targeted Drug Delivery : Concepts and Design-Padma V. Devarajan 2014-12-08 This authoritative volume explores the fundamental concepts and numerous applications of targeted delivery of drugs to the body. This compilation has been divided into eight sections comprised of the basic principles of drug targeting, disease and organ/organelle-based targeting, passive and active targeting strategies, and various advanced drug delivery tools such as functionalized lipiddic, polymeric and inorganic nanocarriers. Together, the twenty-three chapters cover a wide range of topics in the field, including tumor and hepatic targeting, polymer-drug conjugates, nanoemulsion, physical and biophysical characteristics of nanoparticles, and in vivo imaging techniques, among others. The book also examines advanced characterization techniques, regulatory hurdles and toxicity-related issues that are key features for successful commercialization of targeted drug delivery system products. Targeted Drug Delivery is a comprehensive reference guide for drug delivery researchers, both beginners and those already working in the field.
Computational Pharmaceutics—Defang Ouyang 2015-05-18 Molecular modeling techniques have been widely used in drug discovery fields for rational drug design and compound screening. Now these techniques are used to model or mimic the behavior of molecules, and help us study formulation at the molecular level. Computational pharmaceutics enables us to understand the mechanism of drug delivery, and to develop new drug delivery systems. The book discusses the modeling of different drug delivery systems, including cyclodextrins, solid dispersions, polymorphism prediction, dendrimer-based delivery systems, surfactant-based micelle, polymeric drug delivery systems, liposome, protein/peptide formulations, non-viral gene delivery systems, drug-protein binding, silica nanoparticles, carbon nanotube-based drug delivery systems, diamond nanoparticles and layered double hydroxides (LDHs) drug delivery systems. Although there are a number of existing books about rational drug design with molecular modeling techniques, these techniques still look mysterious and daunting for pharmaceutical scientists. This book fills the gap between pharmaceutics and molecular modeling, and presents a systematic and overall introduction to computational pharmaceutics. It covers all introductory, advanced and specialist levels. It provides a totally different perspective to pharmaceutical scientists, and will greatly facilitate the development of pharmaceutics. It also helps computational chemists to look for the important questions in the drug delivery field. This book is included in the Advances in Pharmaceutical Technology book series.

Resveratrol—Farid A. Badria 2019-02-06 This book intends to strike a balance between developments in research and the fact that researchers must absorb and link to scientific advances with clinical practice so that the management of diseases can be based on sound physiological concepts. This book addresses several controversial issues regarding a natural molecule with fascinating pharmacological and therapeutic effects. The book contains three sections: Section 1: Pharmacology and Therapeutic Applications of Resveratrol; Section 2: Bioavailability, Metabolism, and Mode of Action of Resveratrol; Section 3: Resveratrol and Its Role in Chronic and Degenerative Diseases. Does it Add Life to Years or Years to Life? It is our hope that this book will motivate readers to approach the evidence on the use resveratrol and thereby spark an interest in making further contributions to the current scientific debate and treatment development efforts.

Osmotic Drug Delivery System for a Poorly Soluble Drug—Pallav V. Simariya 2012-08 Compounds with poor aqueous solubility are posing challenges in the development of new dosage form. Drug dissolution rather than permeation through the epithelium of the gastrointestinal tract is responsible for a low oral absorption. One of the pharmaceutical strategies to improve the oral bioavailability is the formulation of solid dispersions. In present research work, Verapamil HCl was selected as model drug, because it has an extremely low aqueous solubility and dissolution rate, but it is well permeable through the membranes of the gastro-intestinal tract. Hence solid dispersion of Verapamil HCl using a very novel carrier Inulin was formulated and concluded that formulation scientists require lesser efforts regarding solubility issues to develop a dosage form of Verapamil HCl. Also good compressibility and flow property of studied solid dispersion make it easy to be formulated into better extended release dosage form like Controlled Porosity Osmotic Pump tablets which provides sustained zero-order release pattern for once a day oral administration that is effective immediately upon administration as well as throughout the period of time of 20-24 hour after administration.

Developing Solid Oral Dosage Forms—Yihong Qiu 2009-03-10 Developing Solid Oral Dosage Forms is intended for pharmaceutical professionals engaged in research and development of oral dosage forms. It covers essential principles of physical pharmacy, biopharmaceutics and industrial pharmacy as well as various aspects of state-of-the-art techniques and approaches in pharmaceutical sciences and technologies along with examples and/or case studies in product development. The objective of this book is to offer updated (or current) knowledge and skills required for rational oral product design and development. The specific goals are to provide readers with: Basics of modern theories of physical pharmacy, biopharmaceutics and industrial pharmacy and their applications throughout the entire process of research and development of oral dosage forms Tools and approaches of preformulation investigation, formulation/process design, characterization and scale-up in pharmaceutical sciences and technologies New developments, challenges, trends, opportunities, intellectual property issues and regulations in solid product development The first book (ever) that provides comprehensive and in-depth coverage of what's required for developing high quality pharmaceutical products to meet international standards It covers a broad scope of topics that encompass the entire spectrum of solid dosage form development for the global market, including the most updated scientific and technological advancements, practice, applications, regulation, intellectual property protection and new development trends with case studies in every chapter A strong team of more than 50 well-established authors/co-authors of diverse background, knowledge, skills and experience from industry, academia and regulatory agencies
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