Drug Delivery Nanoparticles Formulation And Characterization Drugs And The Pharmaceutical Sciences

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A Comprehensive Guide to Nanoparticles in Medicine Springer Nature
Advances in Nanotechnology-Based Drug Delivery Systems covers the core concepts and latest research regarding the use of nanoscale materials for the development and application of drug delivery systems. The book introduces the reader to nanotechnology in drug delivery, covering the synthesis, encapsulation techniques, characterization and key properties of nanoscale drug delivery systems. Later chapters review the broad range of target applications, including site-specific delivery of drugs for cardiovascular disease, cancer, bacterial infection, bone regeneration. and much more. This book helps translate advanced research into a clinical setting, analyzing the toxicity and health and safety challenges associated with utilizing nanotechnology in biomedicine. This will be a useful reference for those interested in nano-sized drug delivery in biomedicine, including academics and researchers in materials science,

biomedical engineering, pharmaceutical science and related disciplines. Provides a clear introduction to nanotechnology in drug delivery, covering key principles, synthesis, characterization and unique properties of nanoscale materials for drug delivery systems“/li> Discusses preclinical, clinical and patented nano-drug delivery systems, enabling the reader to grasp the current state-of-the-art and market Covers a broad range of targets for nanoscale drug delivery systems, such as in neurological disorders, oral disease, renal disease, cancer, skin protection, and much more

Basic Fundamentals of Drug Delivery John Wiley & Sons

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.

Drug Delivery Nanosystems Elsevier

What are lipid nanoparticles? How are they structured? How are they formed? What techniques are best to characterize them? How great is their potential as drug delivery systems? These questions and more are answered in this comprehensive and highly readable work on lipid nanoparticles. This work sets out to provide the reader with a clear and understandable understanding of the current practices in formulation, characterization and drug delivery of lipid nanoparticles. A comprehensive description of the current understanding of synthesis, characterization, stability optimization and drug incorporation of solid lipid nanoparticles is provided. Nanoparticles have attracted great interest over the past few decades with almost exponential growth in their research and application. Their small particle size and subsequent high surface area make them ideal in many uses, but particularly as drug carrier systems. Nanoparticles made from lipids are especially attractive because of their enhanced biocompatibility imparted by the lipid. The work provides a detailed description of the types of lipid nanoparticles available (e.g. SLN, NLC, LDC, PLN) and how they range from imperfect crystalline to amorphous in structure. Current thoughts on where drugs are situated (e.g. in the core, or at the interface) and how this can be manipulated are discussed. The many techniques for production, including the author’s own variant of microwave heating, are fully discussed. Techniques for measuring arguably the most important characteristics of particle size and polydispersity are discussed, along with techniques to measure crystallinity, shape and drug capacity. Finally, a full chapter on techniques for measuring stability, both in the absence and presence of drugs, is discussed, along with suggestions on how to optimize that stability. This work appeals to students of colloid science, practitioners of research into drug delivery and academics alike.

Application of Nanotechnology in Drug Delivery Elsevier
This book introduces the reader to drug delivery with specific emphasis on the use of nanoparticles. It covers properties, characterization, and preparation of different types of nanoparticles and discusses recent advances in their structural design and biomedical application, as well as the issues and challenges associated with their design and use. Some of the topics covered include the potential application of nanoparticles in biomedical fields, hazards associated with use of nanoparticles for drug delivery, size-dependent factors in drug delivery applications, different organic, inorganic and their hybrid systems used in drug delivery, etc. It also highlights use of nanoparticles in controlled and targeted drug delivery, and their application in stimuli-responsive, especially pH-responsive, drug release. Additionally, it also focuses on biomimetic nanoparticles, challenges faced in the designing of nanoparticles for drug delivery in cancer, viral and bacterial diseases. The contents of this volume will be useful to researchers and professionals working on advances in targeted drug delivery systems.
Nanoparticles for Drug Delivery CRC Press
Basic Fundamentals of Drug Delivery covers 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 drug delivery system. The book also covers various approaches involved in optimizing the therapeutic performance of a biomolecule while designing its appropriate advanced formulation. Provides up-to-date information on translating the physicochemical properties of drugs into drug delivery systems Explores how drugs are administered via various routes, such as orally, parenterally, transdermally or through inhalation Contains extensive references and further reading for course and self-study
Drug Delivery Strategies for Poorly Water-Soluble Drugs CRC Press
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.
Nanopharmaceuticals Bentham Science Publishers
Delivery of Drugs: Expectations and Realities of Multifunctional Drug Delivery Systems, Volume Two examines the formulation of micro-nanosized drug delivery systems and recaps opportunities for using physical methods to improve efficacy via mechano-, electroporation. The book highlights innovative delivery methods

like PIPAC, including discussions on the regulatory aspects of complex injectables. 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. This book connects formulation scientists, regulatory experts, engineers, clinical experts and regulatory stakeholders. This level of discussion makes it 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. Delivery of Drugs examines the fabrication, optimization, scale-up, biological aspects, regulatory and clinical success of various micro and nano drug delivery systems. The volume covers site and organ specific targeting approaches, technologies used in preparation of micro - nanoparticles, challenges of complex type of drug delivery forms and role of physical methods in achieving targeted drug effect. Written by a diverse range of international researchers the chapters examine the specific aspects of characterization and manufacturing of drug delivery system for pharmaceutical application and its regulatory aspects. The series Expectations and Realities of Multifunctional Drug Delivery Systems examines the fabrication, optimization, biological aspects, regulatory and clinical success of wide range of drug delivery carriers. This series reviews multifunctionality and applications of drug delivery systems, industrial trends, regulatory challenges and in vivo success stories. Throughout the volumes discussions on diverse aspects of drug delivery carriers, such as clinical, engineering, and regulatory, facilitate insight sharing across expertise area and form a link for collaborations between industry-academic scientists and clinical researchers. Expectations and Realities of Multifunctional Drug Delivery Systems connects formulation scientists, regulatory experts, engineers, clinical experts and regulatory stake holders. The wide scope of the book ensures it as a valuable reference resource for researchers in both academia and the pharmaceutical industry who want to learn more about drug delivery systems.

Nanoconjugate Nanocarriers for Drug Delivery Momentum Press Nanotechnology for Oral Drug Delivery: From Concept to Applications discusses the current challenges of oral drug delivery, broadly revising the different physicochemical barriers faced by nanotechnolgy-based oral drug delivery systems, and highlighting the challenges of improving intestinal permeability and drug absorption. Oral delivery is the most widely used form of drug administration due to ease of ingestion, cost effectiveness, and versatility, by allowing for the accommodation of different types of drugs, having the highest patient compliance. In this book, a comprehensive overview of the most promising and up-to-date engineered and surface functionalized drug carrier systems, as well as opportunities for the development of novel and robust delivery platforms for oral drug administration are discussed. The relevance of controlling the physicochemical properties of the developed particle formulations, from size and shape to drug release profile are broadly reviewed. Advances in both in vitro and in vivo scenarios are discussed, focusing on the possibilities to study the biological-material interface. The industrial perspective on the production of nanotechnology-based oral drug delivery systems is also covered.

Nanotechnology for Oral Drug Delivery: From Concept to Applications is essential reading for researchers, professors, advanced students and industry professionals working in the development, manufacturing and/or commercialization of nanotechnology-based systems for oral drug delivery, targeted drug delivery, controlled drug release, materials science and biomaterials, in vitro and in vivo testing of potential oral drug delivery technologies. Highlights the relevance of oral drug delivery in the clinical setting Covers the most recent advances in the field of nanotechnology for oral drug delivery Provides the scientific community with data that can facilitate and guide their research

Drug Delivery with Targeted Nanoparticles CRC Press

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, hydrosol colloidal dispersions, microemulsions, solid dispersions, cosolvent use, dendrimers, polymer- drug conjugates, polymeric micelles, and mesoporous silica nanoparticles. 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.

Drug Delivery Using Nanomaterials Jones & Bartlett Publishers

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 Spitler, Saeid Zanganeh, Tahereh Jafari, Nasser Khakpash, Mohsen Erfanzadeh, Jim Q Ho, and Nastaran Sakhaie)Nanoparticles in Circulation: Blood Stability (Saeid Zanganeh, Tahereh Jafari, 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-Díez, José Ramos-Vivas, and Inmaculada Ortiz)Membranes for Controlled Release (Vida Araban, Neda Aslankoohi, and Mohammad Raoufi)Controlled Released from Hydrogel (Hossein Riahinezhad, Vida Araban, and Mohammad Raoufi)Nano Delivery Systems (Sophie Laurent, Afsaneh Lahooti, Saeed Shanehsazzadeh, and Robert N Muller)Legal Framework for Protection of Pharmaceutical Trade Marks in Europe and USA (Mohammad Hossein Erfanmanesh, and Shirin Sharifzadeh)Future Perspective on the Smart Delivery of Biomolecules (Erick Yu, Félix Sancenón, Elena Aznar, Ramón Martínez-Máñez, María 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;TargetingReview: Key Features: Comprehensive overview on "smart" targeting and drug delivery systemsUnderstanding of the biological identity of nanoparticles for drug delivery applicationsDetailed information on the legal framework for protection of pharmaceutical trade mark in Europe and the United States

Advances in Nanotechnology-Based Drug Delivery Systems World Scientific

Nanopharmaceuticals reviews advances in the drug delivery field via nanovehicles or nanocarriers that offer benefits like targeted therapy and serves as a single dose magic bullet for multiple drug delivery with improved drug efficiency at a lower dose, transportation of the drug across physiological barriers as well as reduced drug-related toxicity. The chapters are written by a diverse group of international researchers from industry and academia. The series Expectations and Realities of Multifunctional Drug Delivery Systems examines the fabrication, optimization, biological aspects, regulatory and clinical success of wide range of drug delivery carriers. This series reviews multifunctionality and applications of drug delivery systems, industrial trends, regulatory challenges and in vivo success stories. Throughout the volumes discussions on diverse aspects of drug delivery carriers, such as clinical, engineering, and regulatory, facilitate insight sharing across expertise area and form a link for collaborations between industry-academic scientists and clinical researchers. Expectations and Realities of Multifunctional Drug Delivery Systems connects formulation scientists, regulatory experts, engineers, clinical experts and regulatory stake holders. The wide scope of the book ensures it as a valuable reference resource for researchers in both academia and the pharmaceutical industry who want to learn more about drug delivery systems. Other volumes in the Expectations and Realities of Multifunctional Drug Delivery Systems book series: Delivery of Drugs, Volume 2, 9780128177761 Drug Delivery Trends, Volume 3, 9780128178706 Drug Delivery Aspects, Volume 4, 9780128212226 Encompasses functional aspects of nanocarriers

Discusses Intellectual Property landscapes of micro-nano drug carriers Contains in-depth investigation of specific aspects of drug delivery systems

Drug Delivery Systems John Wiley & Sons

Nanotechnology and nanoparticles have emerged as an important tool towards improving cancer therapeutics and diagnostics. Recognizing the indispensable role of nanoparticles, specifically in targeted delivery of chemotherapeutic and other anti-cancer agents to tumors, this book provides a comprehensive account of the different methods used for the preparation of nanoparticles, including the mechanism behind each method, for a beginner in the field. The authors describe he commonly used methods of physical post-synthesis characterization, as well as the toxicity aspects of nanoparticles, particularly the effect of nanoparticles on different systems of the human body. Appreciating the interdisciplinary nature of nanotechnology applications in cancer drug delivery, a brief description of the genesis and growth of a tumor has also been included in the book.

Fundamentals of Pharmaceutical Nanoscience Academic Press

Drug Delivery Aspects reviews additional features of drug delivery systems, along with the standard formulation development, like preclinical testing, conversion into solid dosage forms, roles of excipients and polymers used on stability and sterile processing. There is a focus on formulation engineering and related large scale (GMP) manufacturing, regulatory, and functional aspects of drug delivery systems. A detailed discussion on biologics and vaccines gives insights to readers on new developments in this direction. The series Expectations and Realities of Multifunctional Drug Delivery Systems examines the fabrication, optimization, biological aspects, regulatory and clinical success of wide range of drug delivery carriers. This series reviews multifunctionality and applications of drug delivery systems, industrial trends, regulatory challenges and in vivo success stories. Throughout the volumes discussions on diverse aspects of drug delivery carriers, such as clinical, engineering, and regulatory, facilitate insight sharing across expertise area and form a link for collaborations between industry-academic scientists and clinical researchers. Expectations and Realities of Multifunctional Drug Delivery Systems connects formulation scientists, regulatory experts, engineers, clinical experts and regulatory stake holders. The wide scope of the book ensures it as a valuable reference resource for researchers in both academia and the pharmaceutical industry who want to learn more about drug delivery systems. Encompasses engineering and large-scale manufacturing of nanocarriers Considers preclinical, regulatory and ethical guidelines on nanoparticles Contains in-depth discussions on delivery of biologics, vaccines and sterilisation Industrial view on solid dispersions, milling techniques

Nanotechnology in Drug Delivery Springer Nature

Covering spider silk and silk worm cocoons, the editors elucidate the extraction, structure and properties of silk sericin and silk fibroin.

Nanotechnology-Based Targeted Drug Delivery Systems for Lung Cancer Elsevier

The reader will be introduced to various aspects of the

fundamentals of nanotechnology based drug delivery systems and the application of these systems for the delivery of small molecules, proteins, peptides, oligonucleotides and genes. How these systems overcome challenges offered by biological barriers to drug absorption and drug targeting will also be described.

Surface Modification of Nanoparticles for Targeted Drug Delivery Springer Science & Business Media

This new volume presents a plethora of new research on the use of nanoconjugate nanocarriers in drug delivery. Nanotechnology as drug carriers has been observed to increase the level of sophistication through a variety of ways. It helps to alleviate some of the pitfalls of conventional dosage forms, such as few pitfalls such as non-specific drug delivery, dose dumping, poor patient compliance, toxicities linked with higher doses, etc. With chapters from highly skilled, experienced, and renowned scientists and researchers, Nanoconjugate Nanocarriers for Drug Delivery is divided into four sections, providing an introduction to nanocarriers for drug delivery, physicochemical features of nanocarriers, and specific applications dealing with drug delivery in particular. The materials used as well as formulation and characterization have been discussed in detail. The nanocarriers covered in the book include nanoparticles, vesicular carriers, carriers having carbon as the core constituent, dispersed systems, etc. The book also delves into the interaction and associations between drug delivery research and its therapeutic applications in practice. The book integrates a wide variety of case studies, research, and theories in an attempt to reveal the diversity and capture the novel approaches of nanoconjugate nanocarriers for drug delivery employed by developers and content experts in the field. This timely publication will be an essential reference and current awareness source, building on the available literature in the field of pharmacy and biomedical science, while also providing ideas for further research opportunities in this dynamic field.

Multifunctional Nanoparticles for Drug Delivery Applications Springer Science & Business Media

Drug Delivery is the latest and most up-to-date text on drug delivery and offers an excellent working foundation for students and clinicians in health professions and graduate students including nursing, pharmacy, medicine, dentistry, as well as researchers and scientists. Presenting this complex content in an organized and concise format, Drug Delivery allows students to gain a strong understanding of the key concepts of drug delivery. This text focuses on the basic concepts of drug delivery while thoroughly examining various topics such as: CNS delivery Gene delivery Ocular delivery World-wide research on drug delivery Recent advances in drug delivery A significant advancement has been made in the field of drug delivery. This text provides a detailed overview of drug delivery systems, routes of drug administration and development of various formulations. The cutting edge research being carried out in this field will be compiled and a focus on worldwide research on drug delivery and targeting at the molecular, cellular, and organ levels will also be summarized. Each new print copy includes access to the Navigate Companion Website including: Chapter Quizzes, Interactive Glossary, Crossword Puzzles , Interactive Flashcards, and Matching Exercises

Delivery of Drugs Springer Science & Business Media

There is a clear need for innovative technologies to improve the delivery of therapeutic and diagnostic agents in the body. Recent breakthroughs in nanomedicine are now making it possible to deliver drugs and therapeutic proteins to local areas of disease or tumors to maximize clinical benefit while limiting unwanted side effects. Nanomedicine in Drug Delivery gives an overview of aspects of nanomedicine to help readers design and develop novel drug delivery systems and devices that build on nanoscale technologies. Featuring contributions by leading researchers from around the world, the book examines: The integration of nanoparticles with therapeutic agents The synthesis and characterization of nanoencapsulated drug particles Targeted pulmonary nanomedicine delivery using inhalation aerosols The use of biological systems—bacteria, cells, viruses, and virus-like particles—as carriers to deliver nanoparticles Nanodermatology and the role of nanotechnology in the diagnosis and treatment of skin disease Nanoparticles for the delivery of small molecules, such as for gene and vaccine delivery The use of nanotechnologies to modulate and modify wound healing Nanoparticles in bioimaging, including magnetic resonance, computed tomography, and molecular imaging Nanoparticles to enhance the efficiency of existing anticancer drugs The development of nanoparticle formulations Nanoparticles for ocular drug delivery Nanoparticle toxicity, including routes of exposure and mechanisms of toxicity The use of animal and cellular models in nanoparticles safety studies With its practical focus on the design, synthesis, and application of nanomedicine in drug delivery, this book is a valuable resource for clinical researchers and anyone working to tackle the challenges of delivering drugs in a more targeted and efficient manner. It explores a wide range of promising approaches for the diagnosis and treatment of diseases using cutting-edge nanotechnologies.

Nanoparticles CRC Press

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 combatting 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.

Lipid Nanoparticles: Production, Characterization and Stability

John Wiley & Sons

This volume serves as a valuable handbook for the development of nanomedicines made of polymer nanoparticles because it provides researchers, students, and entrepreneurs with all the material necessary to begin their own projects in this field. Readers will find protocols to prepare polymer nanoparticles using different methods, since these are based on the variety of experiences that experts encounter in the field. In addition, complex topics such as, the optimal characterization of polymer nanoparticles is discussed, as well as practical guidelines on how to formulate polymer nanoparticles into nanomedicines, and how to modify the properties of nanoparticles to give them the different functionalities required to become an efficient nanomedicine for different clinical applications. The book also discusses the translation of technology from research to practice, considering aspects related to industrialization of preparation and aspects of regulatory and clinical development.