

Nanostructures For Drug Delivery

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Nanostructures are revolutionizing drug delivery by enabling precise targeting and controlled release of therapeutic agents. These advanced nanomaterials enhance the efficacy of treatments while minimizing side effects, offering a sophisticated approach to medical interventions.

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Nanostructures for Drug Delivery

Nanostructures for Drug Delivery extensively covers the various nanostructured products that have been tested as carriers in target drug delivery systems. In addition, the book analyses the advantages of, and issues related to, using nanostructured materials in drug delivery systems, also detailing various nanocarrier preparation techniques. As delivering the drug to the target site is a major problem in providing effective treatment for many diseases, this book covers the latest advancements in numerous nanotechnological products that are being used in disease detection, controlled drug delivery, as biosensors, and in tissue engineering that have been developed for more efficient patient healthcare. Due to the versatility of nanostructured materials, it is now possible to deliver a drug at its target site in a more accurate and efficient way. This volume is an up-to-date, state-of-the-art work that highlights the principal mechanistic aspects related to the delivery of active nanoscale therapeutic agents (natural or synthetic) and their release profile in different environmental media. It highlights nanoscale encapsulation strategies and discusses both organic and inorganic nanomaterials as carriers and delivery platforms. Demonstrates how nanostructures are successfully employed in drug delivery stems and as drug delivery agents, allowing biomaterials scientists and biochemists to create more effective drug delivery systems. Offers an overview of recent research into the use of nanostructures in drug delivery techniques in a cogent, synthesized way, allowing readers to quickly familiarize themselves with this area. Includes examples of how the application of nanostructures have improved the efficiency of drug delivery systems, showing medical scientists how they are beneficial.

Core-Shell Nanostructures for Drug Delivery and Theranostics

Core-Shell Nanostructures for Drug Delivery and Theranostics: Challenges, Strategies and Prospects for Novel Carrier Systems contains valuable chapters that deal with the fundamentals of nanotechnology for drug delivery, recent developments and research in core-shell nanoparticles for drug-delivery and theranostic applications, and the potential and applications of core-shell nanofiber. This book

is a highly valuable resource for scientists interested in the design and development of innovative drug delivery systems, researchers and graduate/postdoctoral students engaged in biomaterials for drug delivery, and R&D managers in the biomaterials and pharmaceutical industry. Focuses on core-shell nanoparticles and nanofiber for innovative applications, including cancer therapy, controlled release and multi-drug release Considers future prospects and potential new applications of core-shell nanostructures for drug delivery and theranostics Explains the principles and essential concepts of nanotechnology for drug delivery systems

Nanopharmaceutics

Nanomaterials, with their unique size-dependent physical and chemical properties, have shown promising advantages as drug and gene delivery vehicles, ultra-sensitive intracellular detectors and novel therapeutic drugs. Nanopharmaceutics is one of the disciplines that will benefit the most from this technology. Nanotechnology will have a revolutionary impact on cancer diagnosis and therapy due to the exceptional characteristics of nanopharmaceutics. This book provides an overview of some tools, methods, and materials of nanotechnology that offer potential applications in pharmaceutics, followed by a series of examples showing applications that are already in development. It may very well inspire researchers to develop a new generation of pharmaceutics with inventive non-traditional approach and employ nanoscale science for the benefit of the patient.

Nanoparticulates as Drug Carriers

Written by key experts in the field of nanomedicine, this book provides a broad introduction to the important field of nanomedicine and application of nanotechnology for drug delivery. It covers up-to-date information regarding various nanoparticulate drug delivery systems, describes the various opportunities for the application of nanoparticulate drug carriers in different areas of clinical medicine, and analyzes already available information on their clinical applications. This book can be used as an advanced textbook by graduate students and young scientists and clinicians at the early stages of their career. It is also suitable for non-experts from related areas of chemistry, biochemistry, molecular biology, biomedical engineering, physiology, experimental and clinical medicine, and pharmaceutical sciences, who are interested in general problems of drug delivery and drug targeting, as well as in more specialized topics of using nanoparticulate-mediated drug delivery approaches in the individual areas of clinical medicine. Prof Torchilin is an expert in Nanomedicine and a recipient of numerous awards including the Lenin Prize in Science & Technology of the former USSR, membership in the European Academy of Sciences, and AAPS Research Achievement Award in Pharmaceutics and Drug Delivery. He served as an Associate Professor of Radiology at Harvard Medical School before joining Northeastern University as the Chairman of the Department of Pharmaceutical Sciences. Sample Chapter(s). Chapter 1: Introduction. Nanocarriers for Drug Delivery: Needs and Requirements (442 KB). Contents: Nanoparticle Flow: Implications for Drug Delivery (A T Florence); Polymer Micelles as Drug Carriers (E V Batrakova et al.); Lipoproteins as Pharmaceutical Carriers (S Liu et al.); Dendrimers as Nanoparticulate Drug Carriers (S Svenson & D A Tomalia); Cells and Cell Ghosts as Drug Carriers (J M Lanao & M L Sayalero); Magnetic Nanoparticles as Drug Carriers (U O Hnfeli & M Chastellain); Liposomal Drug Carriers in Cancer Therapy (A A Gabizon); Delivery of Nanoparticles to the Cardiovascular System (B-A Khaw); Nanoparticles for Targeting Lymphatics (W Phillips); Nanoparticulate Carriers for Ocular Drug Delivery (A Sanchez & M J Alonso); and other papers. Readership: Graduate students, academics in nanomedicine, clinicians, pharmacologists, pharmacists, bioengineers, researchers in biotechnology and diagnostic imaging."

Drug Delivery Approaches and Nanosystems, Two-Volume Set

This new two-volume set, Drug Delivery Approaches and Nanosystems, Volume 1: Novel Drug Carriers and Volume 2: Drug Targeting Aspects of Nanotechnology presents a comprehensive look at the state-of-the-art research and developments in drug delivery systems using nanotechnology and its applications. Many methods of drug delivery systems have been used, but very few of them have been validated for medical use. A major reason for the above situation, the editors believe, is due to the gap between academia and research, and the gap between academic research and real-time clinical applications and needs. These volumes address that gap. Volume 1 addresses the ubiquitous applications of nanotechnology or nano-sized materials in the medical field and the real-world challenges and complexities of current drug delivery methodologies and techniques, while Volume 2 focuses on drug targeting aspects of nanotechnology. Together they provide a thorough review of the applications

of nanotechnology or nano-sized materials in the medical field and the real-world challenges and complexities of current drug delivery methodologies and techniques. These two volumes will provide a plethora of real-world information for the application of drug delivery approaches via nanotechnology that will be valuable to scientists and researchers as well as faculty and students. The volumes are available separately or together as a set.

Nanomedicine for Drug Delivery and Therapeutics

This book describes a broad area of nanomedicine which involves mainly applications, diseases, and diagnostics. The comprehensive coverage provides researchers, academics, and health specialists with a great tool, that includes techniques applicable to various uses.

Nanomaterials: Evolution and Advancement towards Therapeutic Drug Delivery (Part II)

The development of a vector for the delivery of therapeutic drugs in a controlled and targeted fashion is still a major challenge in the treatment of many diseases. The conventional application of drugs may lead to many limitations including poor distribution, limited effectiveness, lack of selectivity and dose dependent toxicity. An efficient drug delivery system can address these problems. Recent nanotechnology advancements in the biomedical field have the potential to meet these challenges in developing drug delivery systems. Nanomaterials are changing the biomedical platform in terms of disease diagnosis, treatment and prevention. Nanomaterials aided drug delivery provides an advantage by enhancing aqueous solubility that leads to improved bioavailability, increased residence time in the body, decreased side effects by targeting drugs to the specific location, reduced dose dependent toxicity and protection of drugs from early release. In this two-part book, the contributors have compiled reports of recent studies illustrating the promising nanomaterials that can work as drug carriers which can navigate conventional physiological barriers. A detailed account of several types of nanomaterials including polymeric nanoparticles, liposomes, dendrimers, micelles, carbon nanomaterials, magnetic nanoparticles, solid lipid-based nanoparticles, silica nanomaterials and hydrogels for drug delivery is provided in separate chapters. The contributors also present a discussion on clinical aspects of ongoing research with insights towards future prospects of specific nanotechnologies. Part II covers the following topics: · Solid lipid nanoparticles and nanostructured lipid carriers · Silica based nanomaterials · Hydrogels · Metallic nanoparticles · Computational and experimental binding interactions of drug and β -cyclodextrin · Clinical milestones in nanotherapeutics · Drug delivery systems based on poly(lactide-co-glycolide) and its copolymers The book set is an informative resource for scholars who seek updates in nanomedicine with reference to nanomaterials used in drug delivery systems.

Advances in Nanomaterials for Drug Delivery

Nanomedicine is a developing field that includes different disciplines such as material science, chemistry, and engineering and medicine devoted to the design, synthesis and construction of high-tech nanostructures. The ability of these structures to have their chemical and physical properties tuned by structural modification has allowed their use in drug-delivery systems, gene-therapy delivery and various types of theranostic approaches. Colloidal noble metal nanoparticles and other nanostructures have many therapeutic and diagnostic applications. The concept of drug targeting as a magic bullet has led to much research in chemical modification to design and optimize the binding to targeted receptors. It is important to understand the precise relationship between the drug and the carrier, and its ability to target specific tissues, and pathogens to make an efficient drug-delivery system. This book covers advances based on different drug-delivery systems: polymeric and hyper-branched nanomaterials, carbon-based nanomaterials, nature-inspired nanomaterials and pathogen-based carriers

Drug Delivery Using Nanomaterials

After the drug discovery and development process, designing suitable formulations to safely deliver the optimum dose, while avoiding side effects, has been a constant challenge, especially when drugs are very toxic and have poor solubility and undesirable clearance profiles. With recent advances in synthetic technologies, nanoparticles can be custom-made from a variety of advanced materials to mimic the bioenvironment and can be equipped with various targeting and imaging moieties for site-specific delivery and real-time imaging. Drug Delivery Using Nanomaterials covers advancements in the field of nanoparticle-based drug-delivery systems, along with all the aspects needed for a successful and marketable nanoformulation. FEATURES Offers a general overview of the entire process involved in the synthesis and characterization of pharmaceutical nanoparticles Covers a broad range of synthetic

materials for developing nanoformulations customized for specific disease states, target organs, and drugs Every chapter sequentially builds, providing a progressive pathway from classical nanoparticles to the more advanced to be used as a full drug product by consumers Provides information in a bottom-up manner in that definitions and explanations of relevant background information serve as a framework for understanding advanced concepts This user-friendly reference is aimed at materials engineers, chemical engineers, biomedical engineers, pharmaceutical scientists, chemists, and others working on advanced drug delivery, from academia as well as industry.

Self-Organizing Nanovectors for Drug Delivery

Nanomedicine represents one of the most investigated areas in the last two decades in the field of pharmaceuticals. Several nanovectors have been developed and a growing number of products have been approved. It is well known that many biomaterials are able to self-organize under controlled conditions giving rise nanostructures. Polymers, lipids, inorganic materials, peptides and proteins, and surfactants are examples of such biomaterials and the self-assembling property can be exploited to design nanovectors that are useful for drug delivery. The self-organization of nanostructures is an attractive approach to preparing nanovectors, avoiding complex and high-energy-consuming preparation methods, and, in some cases, facilitating drug loading procedures. Moreover, preparations based on these biocompatible and pharmaceutical grade biomaterials allow an easy transfer from the lab to the industrial scale. This book reports ten different works, and a review, aiming to cover multiple strategies and pharmaceutical applications in the field of self-organizing nanovectors for drug delivery.

Drug Delivery Approaches and Nanosystems, Volume 2

This volume is a thorough presentation of the state-of-the-art research and developments in drug delivery systems using nanotechnology and its applications. The second of this two-volume set, it addresses the applications of nanotechnology or nano-sized materials in the medical field and the real-world challenges and complexities of current drug delivery methodologies and techniques. This volume includes 11 chapters that focus on the targeting facet of drug delivery systems. Targeting is a focused maneuver to achieve the specified goals, including achieving the desired result and reaching the specific location. Targeting has now been successfully achieved for several diseases/disorders; however, its role is noteworthy in cancer treatment where chemotherapy is a main course of approach. Nanotechnology-based products have great potential by virtue of their inherent features. This edited book provides a detailed application of nanotechnology in drug delivery systems in health care. The book discusses general principles of drug targeting, material of construction and technological concerns of nanoparticles, and different drug delivery systems and their preparation. Taken together, the informative chapters will provide researchers and scientists as well as faculty and students with valuable research on the effective use of new approaches in advanced drug delivery nanosystems. Volume 1 of the two-volume series is subtitled Novel Drug Carriers. The volumes are available separately or as a set.

Materials for Biomedical Engineering: Nanomaterials-based Drug Delivery

Materials for Biomedical Engineering: Nanomaterials-Based Drug Delivery highlights the progress made in the field of nanostructures bioactive materials and their impact on efficient drug delivery towards personalized medicine. Drug delivery is a well investigated and challenging bio-medical field, with promising perspectives in medicine and engineering. This book brings together the latest research findings regarding nanostructured materials and their potential in designing highly efficient and personalized drug delivery systems. Provides a valuable resource of recent scientific progress, highlighting the most well-known applications of nanostructures in drug delivery systems Includes novel opportunities and ideas for developing or improving technologies in composites by companies, biomedical industries, and in related sectors Features at least 50% of references from the last 2-3 years

Nanoconjugate Nanocarriers for Drug Delivery

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.

Advances in Nanomaterials for Drug Delivery

Nanomedicine is a developing field, which includes different disciplines such as material science, chemistry, engineering and medicine devoted to the design, synthesis and construction of high-tech nanostructures. The ability of these structures to have their chemical and physical properties tuned by structural modification, has allowed their use in drug delivery systems, gene therapy delivery, and various types of theranostic approaches. Colloidal noble metal nanoparticles and other nanostructures have many therapeutic and diagnostic applications. The concept of drug targeting as a magic bullet has led to much research in chemical modification to design and optimize the binding to targeted receptors. It is important to understand the precise relationship between the drug and the carrier and its ability to target specific tissues, and pathogens to make an efficient drug delivery system. This book covers advances based on different drug delivery systems: polymeric and hyper branched nanomaterials, carbon-based nanomaterials, nature-inspired nanomaterials, and pathogen-based carriers.

Nanomaterials in Drug Delivery, Imaging, and Tissue Engineering

This groundbreaking, multidisciplinary work is one of the first books to cover Nanotheragnostics, the new developmental edge of nanomedicine. Through a collection of authoritative chapters, the book reports on nanoscopic therapeutic systems that incorporate therapeutic agents, molecular targeting, and diagnostic imaging capabilities. An invaluable reference for researchers in materials science, bioengineering, pharmacy, biotechnology, and nanotechnology, this volume features four main parts on biomedical nanomaterials, advanced nanomedicine, nanotheragnostics, and nanoscaffolds technology.

Handbook of Materials for Nanomedicine

In the fast-developing field of nanomedicine, a broad variety of materials have been used for the development of advanced delivery systems for drugs, genes, and diagnostic agents. With the recent breakthroughs in the field, we are witnessing a new age of disease management, which is governed by precise regulation of dosage and delivery. This book presents the advances in the use of metal-based and other nanomaterials for medical imaging, diagnosis, theranostics, and drug delivery. It discusses silver, hybrid gold, and surface-modified magnetic nanoparticles, fluorescent quantum dots, lipid bubbles, and nanobubbles. It provides all available information about these materials and describes in detail their advantages and disadvantages and the areas where they could be utilized successfully. The text also covers topics such as improving bioactivity of poorly soluble actives, cellular and molecular toxicology of nanoparticles, and biofate of nanoemulsions.

Hybrid Nanomaterials for Drug Delivery

Hybrid Nanomaterials for Drug Delivery covers a broad range of hybrid nanomaterials and nanocomposites used in drug delivery systems. The book reviews a variety of hybrid nanomaterials and structures, including polymer-lipid, chitosan-based, protein-inorganic, quantum dot hybrids, and more. The strengths, limitations and regulatory aspects of hybrid drug delivery systems are also discussed, allowing readers to make informed decisions when choosing to utilize hybrid nanomaterials. Users will find this to be an exciting and comprehensive look into this emerging area. It will be of particular interest to academics and researchers working in materials science, engineering, biomedical engineering, nanotechnology and pharmaceutical science. Multi nanocarrier-based hybrid systems are an emerging concept in the field of drug delivery that allow researchers to avoid some of the challenges faced when administering drugs, such as low bioavailability, development of drug resistance, toxicities,

premature drug release, and therapeutic efficacy. Describes the properties, synthesis and application of hybrid nanomaterials for use in drug delivery systems Reviews a variety of hybrid nanomaterials and structures, including dendrimer, silica-based, polymer-metal, nanogel systems, and more Discusses the strengths, limitations and regulatory aspects of hybrid drug delivery systems

Nanopharmaceuticals

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

Nanobiomaterials

This new volume focuses on the ever-growing and ever-sophisticated use of nanobiomaterials in drug delivery. There have been significant developments in the delivery of the active pharmaceutical ingredients to target sites, thereby sparing the normal functioning biological systems from damage, and this volume highlights some of the most important developments in the field. The book first provides an overview of nanobiomaterials and then goes on to report on new developments in drug delivery and nanotechnology, nanobiomaterials as carriers in cancer therapy, and the diverse uses of nanobiomaterials. Broken into sections, the chapters cover: an overview of nanobiomaterials drug delivery and nanotechnology nanobiomaterials as carriers in cancer therapeutics diverse uses of nanobiomaterials This volume will be a valuable resource on drug delivery for pharmaceutical manufacturers, healthcare personnel, and researchers.

Nano- and Microscale Drug Delivery Systems

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

Drug Delivery Approaches and Nanosystems, Volume 1

This volume, the first of the two-volume Drug Delivery Approaches and Nanosystems series, presents a full picture of the state-of-the-art research and development in drug delivery systems using nan-

otechnology and its applications. It addresses the ever-expanding application of nanotechnology or nano-sized materials in the medical field and the real-world challenges and complexities of current drug delivery methodologies and techniques. Many methods of drug delivery systems have been used, but very few of them have been validated for medical use. A major reason for the above situation, the editors believe, is the gap between academia and research, and the gap between academic research and real-time clinical applications and needs. This volume addresses that gap. This volume presents 12 chapters that provide information about the preparation and characterization of nanocomposite materials used in drug delivery systems; advanced research of carbon nanotubes, nanocomposite materials, and polymer-clay, ceramics, and silicate glass-based nanocomposites; and the functionality of graphene nanocomposites. The book also provides detailed information on the application of nanotechnology in drug delivery systems in health care systems and medicine. The book describes how nanostructures are synthesized and draws attention to wide variety of nanostructures available for biological research and treatment applications. This valuable volume provides a wealth of information that will be valuable to scientists and researchers, faculty, and students. Volume 2 of the two-volume series is subtitled Drug Targeting Aspects of Nanotechnology. The volumes are available separately or as a set.

Pharmaceutical Nanotechnology, 2 Volumes

With its focus on concrete methods and recent advances in applying nanotechnology to develop new drug therapies and medical diagnostics, this book provides an overall picture of the field, from the fundamentals of nanopharmacy with the characterisation and manufacturing methods to the role of nanoparticles and substances. Actual examples of utilization include drug development issues, translation to the clinic, market prospects, and industrial commercialization aspects. The applications described are taken from cancer treatment as well as other major therapeutic areas, such as infectious diseases and dermatology. An in-depth discussion on safety, regulatory, and societal aspects rounds off the book. Written by a top team of editors and authors composed of the leading experts in Europe and the USA who have pioneered the field of nanopharmacy!

Functional Nanostructures for Sensors, Optoelectronic Devices and Drug Delivery

Nanoparticles and nanostructured materials represent an active area of research and impact in many application fields. The recent progress obtained in the synthesis of nanomaterials, and the fundamental understanding of their properties, has driven significant advances for their technological applications. The Special Issue "Functional Nanostructures for Sensors, Optoelectronic Devices and Drug Delivery" aims to provide an overview of the current research activities in the field of nanostructured materials with a particular emphasis on their potential applications for sensors, optoelectronic devices and biomedical systems. The Special Issue includes submission of original research articles and comprehensive reviews that demonstrated or summarized significant advances in the above-mentioned research fields. The Special Issue is made up of fifteen original research articles and three comprehensive reviews covering various topics of nanostructured materials and relative characterization from fundamental research to technological applications. More than 100 scientists from universities and research institutions lent their expertise and shared their research activities to ensure the success of this Special Issue.

Pharmaceutical Nanotechnology

With its focus on concrete methods and recent advances in applying nanotechnology to develop new drug therapies and medical diagnostics, this book provides an overall picture of the field, from the fundamentals of nanopharmacy with the characterisation and manufacturing methods to the role of nanoparticles and substances. Actual examples of utilization include drug development issues, translation to the clinic, market prospects, and industrial commercialization aspects. The applications described are taken from cancer treatment as well as other major therapeutic areas, such as infectious diseases and dermatology. An in-depth discussion on safety, regulatory, and societal aspects rounds off the book. Written by a top team of editors and authors composed of the leading experts in Europe and the USA who have pioneered the field of nanopharmacy!

Nanotherapeutics

This timely book provides an overview of possible therapeutic applications. The first part of the book highlights general properties of and phenomena observed with nanoparticles, and the subsequent

consequences for applications in drug delivery. The second part focuses on the therapeutic approaches that are possible through the use of nanoparticles, with each chapter discussing a specific disease (e.g., diabetes, cancer, inflammation) and the relevant therapeutic approaches based on the design of nanoparticulate drug delivery systems. From this concise book, readers will gain an insight into the basics of nanoparticle preparation and find a more detailed account of what is therapeutically feasible by using nanoparticle approaches.

Nanobiomaterials in Drug Delivery

Nanobiomaterials in Drug Delivery: Applications of Nanobiomaterials presents novel approaches regarding nanostructured drug delivery systems, revealing the most investigated materials for the development of particular nanobioshuttles. This book brings the results of current research to reach those who wish to use this knowledge in an applied setting, providing one coherent text, with focused chapters and easily accessible information. At its core, it is a collection of titles, bringing together many of the novel applications these materials have in biology, also discussing the advantages and disadvantages of each application and the perspectives of the technologies based on these findings. At the moment, there is no other comparable book series covering all the subjects approached in this set of titles. Provides up-to-date and well-structured reference material for students, researchers, and practitioners working in the biomedical, biotechnological, and engineering fields. Presents a valuable guide to recent scientific progress, along with most known applications of nanomaterials in the biomedical area. Proposes novel opportunities and ideas for developing or improving technologies in nanomedicine/nanobiology.

Nanostructured Biomaterials for Overcoming Biological Barriers

Overcoming biological barriers is of importance for solving the problems of many current drugs and vaccines, and is especially relevant in the commercial exploitation of new therapeutic strategies. This book focuses on the mechanistic issues related to the interaction between drug delivery systems and biological barriers.

Nanopharmaceuticals: Principles and Applications Vol. 2

This book presents the comprehensive description of basic principles, methodologies, similarities and differences of nano-liposomes and -phytosomes. It focuses on the implications of these nano carriers in drug delivery and also includes detailed classification of nanoionized drug particles, polymeric nanoparticles and hydrophobic nanoparticles. This book concludes with the biological, technical and study-design challenges of Nanopharmaceuticals and presents critical viewpoints of smart DNA nanostructures. The risk factors and regulatory concerns have also been kept in focus and the book includes the toxicity and application of different types of ionic liquids for humans and environment. It also critically describes characteristics, applications and regulatory gaps of nanoparticle-ionic liquid combined systems.

Advances in Personalized Nanotherapeutics

Personalized health care to manage diseases and optimized treatment is crucial for everyone to maintain health quality. Significant efforts have been made to design and develop novel nano-enabling therapeutic strategies to cure and monitor diseases for personalized health care. As state-of-the-art, various strategies have been reported to develop personalized nanomedicine to combat against target diseases with no side effects. In this book proposal, we are trying to describe fundamentals of personalized nanomedicine, novel nanomaterials for drug delivery, role of nanotechnology for efficient therapeutics approach, nano-pharmacology, targeted CNS drug delivery, stimuli responsive drug release and nanotechnology for diseases management. This book would serve as a platform for new scholars to understand state-of-the-art of nanotechnology for therapeutics and designing their future research to develop effective personalized nanomedicine against targeted diseases. As of now, various studies have been reported to design and develop nanomedicines of higher efficacy but unfortunately, such products are up to laboratory research only and need to be well-tested using pre-clinical or human models. Our book would be a call for experts to explore multidisciplinary research for developing novel and efficient approaches to explore smart efficient nanocarriers for site-specific on-demand controlled drug delivery to combat against targeted diseases to personalized health care.

Intelligent Nanomaterials for Drug Delivery Applications

Intelligent Nanomaterials for Drug Delivery Applications discusses intelligent nanomaterials with a particular focus on commercial and premarket tools. The book looks at the applications of intelligent nanomaterials within the field of medicine and discusses their future role. This includes the use of intelligent nanomaterials for drugs used in cardiovascular and cancer treatments and examines the promising market of nanoparticles for biomedical and biosensing applications. This resource will be of great interest to scientists and researchers involved in multiple disciplines, including micro- and nano-engineering, bionanotechnology, biomedical engineering, and nanomedicine, as well as pharmaceutical and biomedical industries. Focuses on applications of intelligent nanomaterials within the field of medicine and discusses their role in the future Discusses intelligent nanomaterials, with a particular focus on commercial and premarket tools Examines the promising market of nanoparticles for biomedical and biosensing applications

Design of Nanostructures for Theranostics Applications

Design of Nanostructures for Theranostics Applications focuses on the theranostics applications of nanostructures. In particular, multifunctional nanoparticles for diagnostics and treatment of different diseases, including those relating to the blood-brain barrier, are discussed in detail. Chapters explore different type of nanostructures, covering design, fabrication, functionalization and optimization, helping readers obtain the desired properties. Written by a diverse range of international academics, this book is a valuable reference resource for those working in both nanoscience and the pharmaceutical industry. Explores how the design of a range of nanomaterials make them effective theranostic agents, including multifunctional core-shell nanostructures, mesoporous silica nanoparticles, and quantum dots Shows how nanomaterials are used effectively for a range of diseases, including breast cancer, prostate cancer and neurological disorders Assesses the pros and cons of using different nanomaterials for different types of treatment

Nanoengineered Biomaterials for Advanced Drug Delivery

Nanoengineered Biomaterials for Advanced Drug Delivery explores the latest advances in the applications of nanoengineered biomaterials in drug delivery systems. The book covers a wide range of biomaterials and nanotechnology techniques that have been used for the delivery of different biological molecules and drugs in the human body. It is an important resource for biomaterials scientists and engineers working in biomedicine and those wanting to learn more on how nanoengineered biomaterials are being used to enhance drug delivery for a variety of diseases. Nanoengineered biomaterials have enhanced properties that make them more effective than conventional biomaterials as both drug delivery agents, and in the creation of new drug delivery systems. As nanoengineering becomes more cost-effective, nanoengineered biomaterials have become more widely used within biomedicine. Offers an informed overview on how nanoengineering biomaterials enhance their properties for drug delivery applications Discusses the major applications of nanoengineered biomaterials for drug delivery Outlines the major challenges for successfully implementing nanoengineered biomaterials into existing drug delivery systems

Carbon-Based Nanocarriers for Drug Delivery

Carbon-Based Nanocarriers for Drug Delivery enlists the latitudes and advancements in the synthesis processes, functionalization, and applications of carbon-based nanomaterials (CBNs) in targeted drug delivery systems (DDSs). It covers the applicability and suitability of CBNs as nanocarriers for efficient drug delivery application via elucidating the recent advancements in CBNs, their functionalized and innovative derivatives, and the relevant case studies. The book explores the necessity, efficacy, toxicological aspects, and challenges for the application of CBN in targeted DDSs. Some of the features of this book are provided as follows: Provides elaborative description on significance and adaptability of carbon-based nanomaterial in targeted drug delivery for wide ranges of therapeutics Delivers a full-spectrum discussion on drug delivery through carbon-based nanocarriers Explores each carbon-based nanocarrier fundamentally for its drug and gene-delivery-related applications Describes critical discussion on various toxicological effects over the utilization of these nanocarriers Embraces existing as well as novel technologies/methodologies related to the synthesis and functionalization of CBNs, including graphene, graphene oxide, carbon quantum dots, carbon nanotube, fullerene, and smart carbon-based nanocarriers This book is aimed at researchers and graduate students in materials and pharmaceutical engineering, including drug delivery systems.

Advances in Nanomaterials for Drug Delivery

Biological and Pharmaceutical Applications of Nanomaterials presents the findings of cutting-edge research activities in the field of nanomaterials, with a particular emphasis on biological and pharmaceutical applications. Divided into four sections—nanomaterials for drug delivery, antimicrobial nanomaterials, nanomaterials in biosensors, and safety of nanomaterials—this book: Covers topics such as stimuli-responsive nanostructured silica matrixes, gold nanoparticles, and liposomes for targeting drug delivery and dental applications Describes the use of nanocarriers and nanoparticles as cancer and peptide therapeutics, the influence of surface characteristics on microbial adhesion, and the latest developments in antimicrobial nanostructured polymers for medical applications Discusses recent advances in nanodiagnostic techniques for infectious agents, chromogenic biosensors for pathogen detection, electrochemical biosensors for detecting DNA damage and genotoxicity, and molecular imaging with quantum dots including surface modifications by polymers for biosensing applications Featuring contributions from field experts and researchers in industry and academia, Biological and Pharmaceutical Applications of Nanomaterials provides state-of-the-art information on nanomaterials and their use in drug delivery, infection control, and biomedicine.

Biological and Pharmaceutical Applications of Nanomaterials

Nanostructured zinc oxide materials are capturing a great deal of interest thanks to their outstanding and multifunctional properties, enabling broad series of intervention in the field of nanomedicine. ZnO can be easily prepared in a broad variety of shapes and shows anticancer and antimicrobial properties that are of interest for tissue engineering, controlled delivery of therapeutics, and even theranostics. This book is thus dedicated to the most recent advances in the field, presented as a collection of research papers and reviews. It spans from the synthesis and characterization of ZnO nanomaterials to their applications in the nanomedicine field, ranging from anticancer nanotherapeutics to dental implants and antibacterial agents.

ZnO Nanostructures for Tissue Regeneration, Drug-Delivery and Theranostics Applications

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

Nano-Biomaterials For Ophthalmic Drug Delivery

Systems of Nanovesicular Drug Delivery provides a thorough insight into the complete and up-to-date discussions about the preparation, properties and drug delivery applications of various nanovesicles. This volume discusses cubosomes, proniosomes and niosomes, dendrimerosomes and other new and effective approaches for drug delivery. It will be a valuable title and resource for academics and pharmaceutical scientists, including industrial pharmacists, analytical scientists, health care professionals and regulatory scientists actively involved in pharmaceutical products and process development of tailor-made polysaccharides in drug delivery applications. Recently, there have been a number of outstanding nanosystems in nanovesicular carrier-forms (such as nanoemulsions, self-nanoemulsifying systems, nanoliposomes, nanotransferosomes, etc.), that have been researched and developed for efficient drug delivery by many formulators, researchers and scientists. However, no previously published books have covered all these drug delivery nanovesicles collectively in a single resource. Provides thorough insights and up-to-date discussions about the various systems of nanovesicular drug delivery Covers advanced trigger-assisted systems (such as iontophoresis, ultra-sound triggering,

etc.) and how they have been used for improved drug delivery by nanovesicles Presents recent advances in drug delivery fields by global leaders and experts from academia, research, industry and regulatory agencies Includes an updated literature review of relevant key topics, good quality illustrations, chemical structures, attractive flow charts and well-organized tables

Systems of Nanovesicular Drug Delivery

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, 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

Nanomaterials for Clinical Applications

Emerging Nanomaterials and Nano-based Drug Delivery Approaches to Combat Antimicrobial Resistance focuses on recent and emerging trends surrounding nanomaterials and nano-drug delivery approaches to combat antimicrobial resistance. The relationship between nanomaterials and antimicrobial activity needs to be deeply explored to meet the challenges of combating antimicrobial resistance. The content of this book is divided into three main topic areas, including (i) how to overcome the existing traditional approaches to combat antimicrobial resistance, (ii) applying multiple drug delivery mechanisms to target multi-drug resistant microbes, and (iii) how nanomaterials can be used as drug carriers. This is an important reference source for those looking to understand how nanotechnology plays an important role in combatting disease and infection. As antimicrobial resistance threatens the effective prevention and treatment of an ever-increasing range of infections caused by bacteria, parasites, viruses, and fungi, this is a timely resource. Outlines how to overcome existing traditional approaches to combatting antimicrobial resistance Explains how to apply multiple drug delivery mechanisms (MDR) to the target area in order to better combat antimicrobial resistance Shows how nanomaterials are used as drug carriers in this context

Emerging Nanomaterials and Nano-based Drug Delivery Approaches to Combat Antimicrobial Resistance