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DARIO TURNER

Nanomaterials for Advanced Biological Applications Springer Nature

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

Handbook of Materials for Nanomedicine Springer Science & Business Media

The brief is the first to focus exclusively on environmentally friendly delivery of pesticides (controlled-release nanoparticulate formulation of pesticides using biodegradable polymers as carriers). The brief also introduces pesticides like Chlorpyrifos and biodegradable polymers like guar-gum. The brief will be extremely useful to the researchers in the field of agrochemicals and will be equally useful for advanced professionals in the field of biology, chemistry, environmental biology, entomology and horticulture.

Bio-Nano Interfaces Springer Nature

This work is an examination of all aspects of the science in developing effective dosage form for drug delivery Pharmaceutics refers to the subfield of pharmaceutical sciences that develops drug delivery products or devices to optimize the drug's performance once administered. This multidisciplinary field draws on physical chemistry, organic chemistry, and biophysics to generate and refine these crucial elements of medical care. Moreover, incorporating such disparate dimensions of drug product design as material properties and legal regulation bridges the gap between effective chemicals and viable medical treatments. Integrated Pharmaceutics provides a comprehensive introduction to the creation and manufacture of effective dosage forms for drug delivery. It presents its subject following the principles of physical pharmacy, product design, and drug regulations. This tripartite structure allows readers to move from theory to practice, beginning from a firm foundation of physical pharmacy principles, including drug solubility and stability estimation, rheology, and interfacial properties. From there, it proceeds to discussions of drug product design and of harmonizing pharmaceutical design with the regulatory regimens and technological standards of the United States, European Union, and Japan. Readers of the second edition of Integrated Pharmaceutics will also find: A glossary defining key terms, extensive informative appendices, and a list of references leading to the primary literature in the field for each chapter Earlier chapters are expanded, with additional new chapters including one entitled "Biotechnology Products" Supplementary instructor guide with questions and solutions available online for registered professors Updated regulatory guidelines including quality by design, design space analysis, process analytical technology, polymorphism characterization, blend sample uniformity, and stability protocols Integrated Pharmaceutics is a useful textbook for graduate students in pharmaceutical sciences, drug formulation and design, and biomedical engineering. In addition, professionals in the pharmaceutical industry, including regulatory bodies, will find it a helpful reference guide.

Ocular Drug Delivery Systems Springer Science & Business Media

In recent decades, bio-nano interfaces have become a popular topic of research. The interface between biology (e.g., cells, proteins) and man-made materials (e.g., surfaces of labware, medical devices/implants, etc., that are exposed to the biological matter) has always been important, way before the terms of nanotechnology and nanoscience were coined. Nanotechnology brought new techniques into play, with which such interfaces can be investigated with an additional viewpoint. This book is a collection of articles spanning two decades that shows how the newer publications have evolved from the older ones. This allows the reader to see the development in the field not only technically but also conceptually. The book is, in particular, suitable for the researchers and general readers who are looking for inspiration on how ideas develop over decades.

Focal Controlled Drug Delivery Springer Nature

The concept of focal controlled drug delivery has been applied for treating illnesses that are localized to a certain tissue or organ. These delivery systems are applied directly to the diseased site and deliver a desired dose for an extended time period while minimizing systemic distribution of toxic drug. Controlled drug delivery systems have been focused on oral extended release formulations and on systemic delivery of small drugs and peptides. Despite the upsurge of interest in focal targeted drug delivery, there is currently no single reference text on the subject. By comparison, there are numerous authored and edited books on oral, systemic and transdermal drug delivery or books on biodegradable polymers as drug carriers. Thus, the aim of Focal Drug Delivery is to bring together leading experts and researchers in the field to provide an authoritative account of the essential pharmaceutical, technological, physiological and biological sciences underpinning the topic. In addition, the book will review advances in treatment options for diseases localized at a certain tissue or organ.

Functional Chitosan William Andrew

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.

Mucosal Delivery of Biopharmaceuticals CRC Press

Nanoscience or the science of the very small offers the pharmaceutical scientist a wealth of opportunities. By fabricating at the nanoscale, it is possible to exert unprecedented control on drug activity. This textbook will showcase a variety of nanosystems working from their design and construction to their application in the field of drug delivery. The book is intended for graduate students in drug delivery, physical and polymer chemistry, and applied pharmaceutical sciences courses that involve fundamental nanoscience. The purpose of the text is to present physicochemical and biomedical properties of synthetic polymers with an emphasis on their application in polymer therapeutics i.e., pharmaceutical nanosystems, drug delivery and biological performance. There are two main objectives of this text. The first is to provide advanced graduate students with knowledge of the principles of nanosystems and polymer science including synthesis, structure, and characterization of solution and solid state properties. The second is to describe the fundamentals of therapeutic applications of polymers in drug delivery, targeting, response modifiers as well as regulatory issues. The courses, often listed as Advanced Drug Delivery and Applied Pharmaceutics; Polymer Therapeutics; or Nanomedicine, are designed as an overview of the field specifically for graduate students in the Department of Pharmaceutical Sciences Graduate Programs. However, the course content may also be of interest for graduate students in related biomedical research programs. These courses generally include a discussion of the major principles of polymer science and fundamental concepts of application of polymers as modern therapeutics. All courses are moving away from the above mentioned course names and going by 'pharmaceutical nanoscience or nanosystems'. This area of research and technology development has attracted tremendous attention during the last two decades and it is expected that it will continue to grow in importance. However, the area is just emerging and courses are limited but they are offered.

Lipid Nanocarriers for Drug Targeting Academic Press

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.

Computational Drug Delivery Walter de Gruyter GmbH & Co KG

This book covers fundamental aspects in the preparation of polymeric in-situ, stimuli-responsive hydrogels; the properties, characterization, chemistry, and fabrication of these hydrogels is detailed, helping the reader to select the most appropriate material and design for the desired application. The book goes on to review applications in ophthalmic drug delivery, covering in vitro and in vivo models, animal models, preclinical testing, patents and more. Stimuli-responsive Hydrogels for Ophthalmic Drug Delivery is a must-have reference for researchers and academics in the fields of materials science, biomaterials, pharmacology and polymer science, with an interest in clinical aspects of hydrogel design and application. - Provides step-by-step coverage for engineering in-situ and stimuli-responsive hydrogels, from design, characterization, and toxicity considerations to fabrication, process optimization, and drug release kinetics - Utilizes an interdisciplinary approach, bringing together authors from pharmacology,

polymer science, and medical backgrounds - Details the advantages and challenges of using stimuli-responsive hydrogels for ophthalmic drug delivery, with a focus on clinical translation

Genetics in Ophthalmology Elsevier

Presenting breakthrough research pertinent to scientists in a wide range of disciplines-from medicine and biotechnology to cosmetics and pharmacy- this Second Edition provides practical approaches to complex formulation problems encountered in the development of particulate delivery systems at the micro- and nano-size level. Completely revised and e

Drug Delivery (book) John Wiley & Sons

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.

Stimuli-Responsive Hydrogels for Ophthalmic Drug Delivery CRC Press

During the past decades, with the introduction of the recombinant DNA, hybridoma and transgenic technologies there has been an exponential evolution in understanding the pathogenesis, diagnosis and treatment of a large number of human diseases. The technologies are evident with the development of cytokines and monoclonal antibodies as therapeutic agents and the techniques used in gene therapy. Immunopharmacology is that area of biomedical sciences where immunology, pharmacology and pathology overlap. It concerns the pharmacological approach to the immune response in physiological as well as pathological events. This goals and objectives of this textbook are to emphasize the developments in immunology and pharmacology as they relate to the modulation of immune response. The information includes the pharmacology of cytokines, monoclonal antibodies, mechanism of action of immune-suppressive agents and their relevance in tissue transplantation, therapeutic strategies for the treatment of AIDS and the techniques employed in gene therapy. The book is intended for health care professional students and graduate students in pharmacology and immunology.

Nano-Biomaterials For Ophthalmic Drug Delivery CRC Press

Nanotechnology has the potential to change every part of our lives. Today, nanotechnology-based products are used in many areas, and one of the most important areas is drug delivery. Nanoparticulate drug delivery systems not only provide controlled delivery of drugs and improved drug solubility but also improve drug efficiency and reduce side effects via targeting mechanisms. However, compared with conventional drug delivery systems, few nanoparticle-based products are on the market and almost all are nontargeted or only passively targeted systems. In addition, obtaining targeted nanoparticle systems is quite complex and requires several evaluation mechanisms. This book discusses the production, characterization, regulation, and currently marketed targeted nanoparticle systems in a broad framework. It provides an overview of targeted nanoparticles' (i) in vitro characterization, such as particle size, stability, ligand density, and type; (ii) in vivo behavior for different targeting areas, such as tumor, brain, and vagina; and (iii) current advances in this field, including clinical trials and regulation processes.

The Wills Eye Manual Lippincott Williams & Wilkins

Ocular Therapeutics: Eye on New Discovery focuses on emerging areas in ocular research, from new approaches to dry eye to gene therapy in the management of retinal diseases. This comprehensive book features more than 25 chapters of information that will be vital for ocular investigators and ophthalmologists bringing them new information on promising therapeutics. It is the intent of this book to provide not only information on current approaches to treatment, but also in giving the reader a greater understanding as to what may become available for treating a number of important eye diseases. Each chapter features some new aspect of treatment that holds great promise for the future. The approach has been to concentrate on those areas of ocular diseases that are more prevalent. It also features new insight for drug delivery and for managing devastating diseases, such as macula edema and glaucoma, two of the leading causes of blindness in the United States. This book will serve as an important resource as it contains a number of relevant references highlighted for their importance to the field. New investigators will be able to obtain an historical perspective for each of the topics and to develop an understanding of the new research directions that are underway. Ocular Therapeutics: Eye on New Discovery is more than a reference book, as it also provides an important glimpse into the near future.* Contains information that is vital for ocular investigators and ophthalmologists bringing them new information on promising therapeutics.* Provides not only information on current approaches to treatment, but also gives the reader a greater understanding as to what may become available for treating a number of important eye diseases.* Historical

perspective for each of the topics as well as an important glimpse into the near future to develop an understanding of the new research directions underway.* New insight for drug delivery and for managing devastating diseases, such as macula edema and glaucoma, two of the leading causes of blindness in the United States

Hydroxyapatite Springer

The objective of this publication is to enhance mutual understanding and communication between ophthalmologists, molecular geneticists, genetic counselors and biomedical researchers. In the introductory chapter, current genetic paradigms and experimental genetic approaches relevant to the nature of hereditary disorders are discussed. The following contribution on the epidemiology of hereditary ocular disorders provides an excellent reference to geneticists as well as clinicians. Myopia is presented as an example of a complex clinical phenotype where genes and environment interact. Further molecular ophthalmogenetic topics, such as corneal dystrophies, cataract, glaucoma, opticus neuropathy, non-syndromic and syndromic pigmentary retinopathies, defects of vitamin A metabolism and macular dystrophies including age-related macular degeneration, are investigated in depth. The volume concludes with a survey of color vision deficiencies, a discussion of animal models and gene therapy, and a useful description of technical devices supporting patients who are losing sight.

The Molecular and Cellular Basis of Retinal Diseases BoD - Books on Demand

Thanks to their unique properties, chitosan and chitosan-based materials have numerous applications in the field of biomedicine, especially in drug delivery. This book examines biomedical applications of functional chitosan, exploring the various functions and applications in the development of chitosan-based biomaterials. It also describes the chemical structure of chitosan and discusses the relationship between their structure and functions, providing a theoretical basis for the design of biomaterials. Lastly, it reviews chemically modified and composite materials of chitin and chitosan derivatives for biomedical applications, such as tissue engineering, nanomedicine, drug delivery, and gene delivery.

Nanomaterials for Medical Diagnosis and Therapy William Andrew

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.

Drug Delivery Devices and Therapeutic Systems Springer Nature

This book is part of a series dedicated to recent advances on preventive, predictive and personalised medicine (PPPM). It focuses on the theme of "Drug delivery systems: advanced technologies potentially applicable in personalised treatments". The critical topics involving the development and preparation of effective drug delivery systems, such as: polymers available, self-assembly, nanotechnology, pharmaceutical formulations, three dimensional structures, molecular modeling, tailor-made solutions and technological tendencies, are carefully discussed. The understanding of these areas constitutes a paramount route to establish personalised and effective solutions for specific diseases and individuals.

Immunopharmacology John Wiley & Sons

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

Fundamentals of Pharmaceutical Nanoscience CRC Press

Analytical nanoscience and nanotechnology is a growing topic that is expected to have a great impact in the field of analytical chemistry. Many of the exceptional properties of gold nanoparticles make them suitable for different analytical applications and these applications allow extrapolations for their use in other fields as well. In analytical chemistry gold nanoparticles play two main roles, namely: i) As target analytes in the realm of the analysis of the nanoworld; and ii) As tools to improve analytical processes, such as the use of gold nanoparticles as components of electrodes, in spectroscopic techniques and (bio)chemical sensors and lateral flow sensors. This book is a comprehensive review of the role of gold nanoparticles in analytical nanoscience and nanotechnology, with chapters devoted to their synthesis, physico-chemical characteristics, derivatization and potential toxicity. The main microscopic, spectroscopic and separation techniques for the characterization are reviewed as well as the developments for their determination in environmental, biological and agrifood samples. - Provides an integral approach devoted to a specific nanoparticle - Considers gold nanoparticles as target analytes, as analytical tools and their relationships - Organizes the material in a novel way