Oral Lipid Based Formulations Enhancing The Bioavailability Of Poorly Water Soluble Drugs Drugs And The Pharmaceutical Sciences

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Antifungal Therapy World Health Organization
Oral lipid-based formulations are attracting considerable attention due to their capacity to facilitate gastrointestinal absorption and reduce or eliminate the effect of food on the absorption of poorly water-soluble, lipophilic drugs. Despite the obvious and demonstrated utility of these formulations for addressing a persistent and growing problem of major significance, the pharmaceutical industry has been slow to apply and further develop this technology. This title provides a comprehensive summary of the theoretical and practical aspects of oral lipid-based formulations for use in industry, and provides further insights into a developing technology expected to assume increasing prominence in years to come.
Fundamentals, Applications and Clinical Development Springer
Nanoemulsions: Formulation, Applications, and Characterization provides detailed information on the production, application and characterization of food nanoemulsion as presented by experts who share a wealth of experience. Those involved in the nutraceutical, pharmaceutical and cosmetic industries will find this a useful reference as it addresses findings related to different preparation and formulation methods of nanoemulsions and their application in different fields and products. As the last decade has seen a major shift from conventional emulsification processes towards nanoemulsions that both increase the efficiency and stability of emulsions and improve targeted drug and nutraceutical delivery, this book is a timely resource. Summarizes general aspects of food nanoemulsions and their formulation Provides detailed information on the production, application, and characterization of food nanoemulsion Reveals the potential of nanoemulsions, as well as their novel applications in functional foods, nutraceutical products, delivery systems, and cosmetic formulations Explains preparation of nanoemulsions by both low- and high-energy methods
Warts and All BoD – Books on Demand
Oral lipid-based formulations are attracting considerable attention due to their capacity to facilitate gastrointestinal absorption and reduce or eliminate the effect of food on the absorption of poorly water-soluble, lipophilic drugs. Despite the obvious and demonstrated utility of these formulations for addressing a persistent and growing problem
Proliposomes: A Manufacturing Technology of Liposomes for Pulmonary Delivery via Nebulization John Wiley & Sons
Biomedical Applications of Nanoparticles describes the most interesting and investigated biomedical applications of nanoparticles, emphasizing their therapeutic impact. Progress made in the therapy of severe diseases, such as cancer and difficult infections is strictly correlated to the scientific progress and technological development in the field of materials science. Nanoparticles

have numerous therapeutic applications, starting with the design of new drugs, delivery systems, therapeutic materials, and their contribution to the development of preventive strategies. The book highlights the impact of nanoparticles on the therapy of infections, antimicrobial effect and also anti-cancer strategies. Successful examples are given throughout the book, along with analysis in order to improve future outcomes of novel therapies. Highlights the term nanotherapeutics and presents several classifications of nanotherapeutics from different points-of-view Presents the recent progress related to nanotherapeutics in the oral cavity Provides the recent progress in the field of biomedical nanoparticles

Application of Molecular Modeling in Drug Delivery Academic Press

Proliposome technologies are stable phospholipid formulations that provide an approach to generating liposomes upon addition of aqueous phase prior to administration. In this monograph, the authors review the potential of proliposomes for pulmonary delivery of liposomes via nebulization using air-jet, ultrasonic and vibrating-mesh nebulizers. They explore both proliposome types, particulate-based and solvent-based. The book concludes that both types are capable of exploiting the energy of nebulization to generate liposomes within nebulizers.

NanoBioMaterials Academic Press

This thesis has explored the use of lipid-based formulations (LBF) to enhance the oral bioavailability of the cholesteryl ester transfer protein (CETP) inhibitor CP-532,623, used here as a model poorly water soluble drug (PWSD), and the impact of dispersion and digestion on formulation performance. A particular focus has been the use of the in vitro lipid digestion model as a tool to predict the oral bioavailability of PWSDs, by investigating the relationship between drug solubilisation after in vitro digestion and in vivo exposure after oral administration.Dispersion and digestion of LBFs are both events that challenge the solubilisation of a co-administered drug. The data show that the development of LBFs can be informed by the dispersion and solubilisation properties of individual excipients after in vitro digestion. Different patterns of solubilisation were observed with changes in the type of excipient employed. Lipids and lipophilic co-surfactants retained drug in an oily phase but were nonetheless resistant to drug precipitation. Hydrophilic surfactants (particularly Kolliphor RH 40) maintained higher drug solubilisation levels after digestion, a characteristic that was maintained within composite formulations containing Kolliphor and additional excipients. Conversely, co-solvents supported high initial drug loading, but provided no ongoing solubilisation when introduced to aqueous media. A series of formulations based on medium chain (MC) lipids and were initially developed to provide for effective drug loading and good dispersion properties. Assessment of these MC-LBFs using the in vitro digestion model revealed varying degrees of susceptibility to precipitation during in vitro digestion, and a broad correlation between drug solubilisation after in vitro digestion and drug absorption after oral administration in beagle dogs.Subsequent modification of the formulations to include long chain (LC) lipids rather than MC lipids generally resulted in higher levels of CP-532,623 solubilisation after in vitro digestion. In all cases the LBFs greatly enhanced in vitro solubilisation and in vivo oral bioavailability of CP-532,623 in fasted beagle dogs when compared to a simple powder formulation. Within related groups of formulations in vitro solubilisation on lipid digestion was also found to correlate with in vivo exposure. Notably, formulations based on LC-LBFs required higher levels of drug solubilisation to achieve similar levels of in vivo exposure, when compared to MC-LBFs. Re-evaluation of the in vitro data to measure drug supersaturation rather than drug solubilisation, however, resulted in improved correlations, especially for formulations containing a common surfactant. Thus, formulations containing Kolliphor RH 40 were absorbed more readily at lower supersaturation levels than formulations containing polysorbate 80 or vitamin E TPGS. The data suggest that the degree of drug solubilisation and supersaturation during in vitro lipid digestion provides some indication of formulation performance but that this alone is insufficient to completely explain patterns of drug absorption. Further investigations into the factors contributing to the high bioavailability obtained in beagle dogs also suggested that drug absorption from LBFs may vary in beagle and greyhound dogs, with drug absorption typically being higher in beagles.In summary, the studies presented here further demonstrate the utility of the in vitro digestion model in formulation development. In conjunction with solubility studies, calculation of drug supersaturation, and characterisation of the physical state of precipitated drug, in vitro lipolysis tests provide useful in vitro indicators of formulation performance. Interestingly, the current studies suggest that whilst the overall patterns of in vitro-in vivo correlation that have previously been described in the literature, may be maintained, they appear to exist in parallel with excipient specific effects on drug absorption and bioavailability. Thus, in addition to concentration or thermodynamic activity, the nature of the solubilised phases formed on lipid formulation digestion appears to be a significant driver of differences in patterns of drug absorption from LBF.

Pharmaceutical Theory and Practice Springer Science & Business Media

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

Enhancing the Bioavailability of Poorly Water-Soluble Drugs CRC Press

The goal of any novel drug delivery system is to provide therapeutic benefits to the patients by increasing duration of drug action, reducing dosing frequency, and controlling drug release rate at the target site, thereby reducing unwanted side effects. Advanced Technology for Delivering Therapeutics is a reference book that covers recent developments in the field of drug delivery science and technology. The purpose of this book is to bring together descriptions of some selective technologies including new and promising nanotechnology currently being investigated for drug delivery applications. This book is a useful source of information for graduate and post-graduate students of pharmacy and biomedical science; pharmaceutical

Developing Solid Oral Dosage Forms CRC Press

This book represents the invited presentations and some of the posters presented at the conference entitled "In Vitro-In Vivo Relationship (IVIVR) Workshop" held in Sep tember, 1996. The workshop was organized by the IVIVR Cooperative Working Group which has drawn together scientists from a number of organizations and institutions, both academic and industrial. In addition to Elan Corporation, which is a drug delivery com pany specializing in the development of ER (Extended Release) dosage forms, the IVIVR Cooperative Working Group consists of collaborators from the University of Maryland at Baltimore, University College Dublin, Trinity College Dublin, and the University of Not tingham in the UK. The principal collaborators are: Dr. Jackie Butler, Elan Corporation Prof. Owen Corrigan, Trinity College Dublin Dr. lain Cumming, Elan Corporation Dr. John Devane, Elan Corporation Dr. Adrian Dunne, University College Dublin Dr. Stuart Madden, Elan Corporation Dr. Colin Melia, University of Nottingham Mr. Tom O'Hara, Elan Corporation Dr. Deborah Piscitelli, University of Maryland at Baltimore Dr. Araz Raoof, Elan Corporation Mr. Paul Stark, Elan Corporation Dr. David Young, University of Maryland at Baltimore The purpose of the workshop was to discuss new concepts and methods in the devel opment of in vitro-in vivo relationships for ER products. The original idea went back ap proximately 15 months prior to the workshop itself. For some time, the principal collaborators had been working together on various aspects of dosage form development.

Prediction and Assessment, Second Edition Springer

Advances in technology permeates every aspect of life, including the healthcare system. Nanotechnology based systems have gained popularity based upon their promise, size, and other characteristics. Multifunctional Nanocarriers for Contemporary Healthcare Applications is a critical academic publication that explores advancements in nanostructured systems, applications of these systems in healthcare, and biomedical applications of these systems. Featuring coverage on a wide range of topics, such as hydrogels, controlled drug delivery systems, and nanomedicine, this book is geared toward researchers, students, and academicians seeking current research on advancements and applications of nanostructured systems in the healthcare industry.

Preclinical Evaluation of Lipid-Based Nanosystems Mdpi AG

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

Formulating Poorly Water Soluble Drugs CRC Press

Drug delivery technologies represent a vast and vital area of Research and Development. The demand for innovative drug delivery systems continues to grow, and this growth continues to drive new developments. Building on the foundation provided by the first edition, Drug Delivery Systems, Second Edition covers the latest developments in both

Role of Lipid Excipients in Modifying Oral and Parenteral Drug Delivery Routledge

The World Malaria Report 2015 assesses global malaria disease trends and changes in the coverage and financing of malaria control programs between 2000 and 2015. It also summarizes progress towards international targets, and provides regional and country profiles that summarize trends in each WHO region and each country with malaria. The report is produced with the help of WHO regional and country offices, ministries of health in endemic countries, and a broad range of other partners. The data presented are assembled from the 96 countries and territories with ongoing malaria transmission, and a further five countries that have recently eliminated malaria. Most data are those reported for 2014 and 2015, although in some cases projections have been made into 2015, to assess progress towards targets for 2015.

Topical Drug Delivery Formulations IGI Global

“Infogest” (Improving Health Properties of Food by Sharing our Knowledge on the Digestive Process) is an EU COST action/network in the domain of Food and Agriculture that will last for 4 years from April 4, 2011. Infogest aims at building an open international network of institutes undertaking multidisciplinary basic research on food digestion gathering scientists from different origins (food scientists, gut physiologists, nutritionists...). The network gathers 70 partners from academia, corresponding to a total of 29 countries. The three main scientific goals are: Identify the beneficial food components released in the gut during digestion; Support the effect of beneficial food components on human health; Promote harmonization of currently used digestion models Infogest meetings highlighted the need for a publication that would provide researchers with an insight into the advantages and disadvantages associated with the use of respective in vitro and ex vivo assays to evaluate the effects of foods and food bioactives on health. Such assays are particularly important in situations where a large number of foods/bioactives need to be screened rapidly and in a cost effective manner in order to ultimately identify lead foods/bioactives that can be the subject of in vivo assays. The book is an asset to researchers wishing to study the health benefits of their foods and food bioactives of interest and highlights which in vitro/ex vivo assays are of greatest relevance to their goals, what sort of outputs/data can be generated and, as noted above, highlight the strengths and weaknesses of the various assays. It is also an important resource for undergraduate students in the ‘food and health’ arena.

Basic Principles and Biological Examples Oral Lipid-Based FormulationsEnhancing the Bioavailability of Poorly Water-Soluble Drugs

Biopolymer-Based Formulations: Biomedical and Food Applications presents the latest advances in the synthesis and characterization of advanced biopolymeric formulations and their state-of-the-art

applications across biomedicine and food science. Sections cover the fundamentals, applications, future trends, environmental, ethical and medical considerations, and biopolymeric architectures that are organized in nano, micro and macro scales. The final section of the book focuses on novel applications and recent developments. This book is an essential resource for researchers, scientists and advanced students in biopolymer science, polymer science, polymer chemistry, polymer composites, plastics engineering, biomaterials, materials science, biomedical engineering, and more. It will also be of interest to R&D professionals, scientists and engineers across the plastics, food, biomedical and pharmaceutical industries. Provides in-depth coverage of methods for the characterization of the physical properties of biopolymeric architectures Supports a range of novel applications, including scaffolds, implant coatings, drug delivery, and nutraceutical encapsulation systems Includes the use of experimental data and mathematical modeling, thus enabling the reader to analyze and compare the properties of different polymeric gels

In Vitro Drug Release Testing of Special Dosage Forms Elsevier

Oral Lipid-Based FormulationsEnhancing the Bioavailability of Poorly Water-Soluble DrugsCRC Press

Oral Delivery of Therapeutic Peptides and Proteins CRC Press

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

Biomedical and Food Applications CRC Press

Solvent systems are integral to drug development and pharmaceutical technology. This single topic encompasses numerous allied subjects running the gamut from recrystallization solvents to biorelevant media. The goal of this contribution to the AAPS Biotechnology: Pharmaceutical Aspects series is to generate both a practical handbook as well as a reference allowing the reader to make effective decisions concerning the use of solvents and solvent systems. To this end, the monograph was created by inviting recognized experts from a number of fields to author relevant sections. Specifically, 15 chapters have been designed covering the theoretical background of solubility, the effect of ionic equilibria and pH on solubilization, the use of solvents to effect drug substance crystallization and polymorph selection, the use of solvent systems in high throughput screening and early discovery, solvent use in preformulation, the use of solvents in bio-relevant dissolution and permeation experiments, solvents and their use as toxicology vehicles, solubilizing media and excipients in oral and parenteral formulation development, specialized vehicles for protein formulation and solvent systems for topical and pulmonary drug administration. The chapters are organized such that useful decision trees are included together with the scientific underpinning for their application. In addition, trends in the use of solvent systems and a balance of current views make this monograph useful to both the novice and experienced researcher and to scientists at all developmental stages from early discovery to late pharmaceutical operations.

Innovative Dosage Forms Springer Science & Business Media

This book presents recent advances in the use of ionic liquids in medicine and pharmaceutics with particular emphasis on addressing critical pharmaceutical challenges, including the low solubility, polymorphism, and bioavailability of drugs. It also provides insights into the development of the biologically functionalized ionic liquids suitable for medical and pharmaceutical applications. Ionic liquids have been used as potential solvents or materials in the fields of pharmaceutical drug delivery and formulations because of their unique and tunable physicochemical and biological properties. Readers find explanations of the diverse approaches to the application of ionic liquids in drug solubility, active pharmaceutical ingredient (API) formulation, and drug delivery systems, such as topical, transdermal, and oral delivery, with particular emphasis on recent developments. Particular attention is given to the development of ionic liquid-assisted effective drug delivery techniques for sparingly soluble or insoluble drug molecules. This book also discusses the biological activities of ionic liquids for possible applications in drug formulation and drug delivery systems. Scientists in disciplines such as chemistry, biology, and pharmaceutics find this book instructive and informative for developing ionic liquid-based drug formulations or drug delivery systems.

Computational Pharmaceutics CRC Press

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