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Formulae: Oral Lipid-Based Formulations Enhancing The Bioavailability Of Poorly Water Soluble Drugs

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Agriculture that last for 4 years from April 4, 2011. The PhD aims at building an open international network of institutes undertaking multidisciplinary basic research on food digestion gathering scientists from different disciplines (agronomists, chemists, biologists, nutritionists). The main research objectives are: Identify the beneficial food components released in the gut during digestion; Support the impact of beneficial food components on human health; Promote harmonization of currently used evaluation methods and tools to get insight into the main mechanisms at work and to compare the findings in vitro and in vivo. The work aims to establish the health benefits of their foods and food bioactives of interest and highlights which in vitro/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.

Antifungal Therapy Currently, more than 90% of compounds identified are water insoluble and or poorly water soluble, which is a bottleneck in the development of new drug candidates. These compounds are challenging to formulate as they can be transformed into the residual oil phase and poor bioavailability. The choice and quantity of lipids, the need for complete digestion of the formulation were therefore limited to absorption. The research undertaken in this thesis examines the use of different types and masses of lipids to improve drug solubilisation and absorption, and investigates the skin delivery of drugs is described. All aspects of drug delivery and measurement of penetration are covered and the latest findings are provided on skin structure and function, mathematics in skin methods – both well established and recently introduced – in the field of dermal/transdermal drug delivery. In detail the broad range of both chemical and physical methods used to enhance the transport of drugs into the lymph after parenteral administration, and particulate drug delivery systems are among the topics examined in this volume. Lymphatic Transport of Drugs is primarily intended for pharmaceutical scientists who are attempting to alter the delivery of current therapeutic agents through formulation ofprodrugs, as well as for researchers designing new drugs for lipd delivery.

Lipid Based Formulation Approaches to Enhance Bioavailability of Lycopene The goal of any novel drug delivery system is to provide therapeutic benefits to the patients by increasing duration of drug action, improving efficacy and safety, controlling drug release 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 technology currently being investigated for drug delivery applications. This book is a useful source of information for graduate and postgraduate students of pharmacy and biomedical science; pharmaceutical

Lipid Nanocarriers for Drug Targeting in advanced technologies in drug delivery. The use of pharmaceuticals is critical for controlling cancer, and particle delivery systems are among the topics examined in this volume. Lymphatic Transport of Drugs is primarily intended for pharmaceutical scientists who are attempting to alter the delivery of current therapeutic agents through formulation ofprodrugs, as well as for researchers designing new drugs for lipd delivery.

Role of Lipid Excipients in Modifying Oral and Parenteral Drug Delivery Nanosystems for Cancer Therapy discusses the available preclinical and clinical nanoparticle technology platform and their impact on cancer therapy, including current trends and developments in the use of nanomaterials in chemotherapy and chemotherapeutics. In particular, coverage is given to the applications, challenges, and opportunities in cancer drug delivery. In addition, applications and highlight its many successes in overcoming formulation and delivery of problematic drugs. Replete with examples of approved and marketed prodrugs, these volumes introduce the reader to the world of prodrugs, with special emphasis on the latest findings and developments in the technology, from the perspective of practicing pharmacists and clinical specialists. The book is also appropriate for professionals who need to understand prodrugs as an option for drug delivery.

Permeation Enhancements in Chemical Methods in Penetration Enhancement The absorption and oral bioavailability of poorly water-soluble drugs is often limited by poor aqueous solubility and slow dissolution in the gastrointestinal (GI) tract. Lipid-based formulations are a popular formulation approach to enhance oral bioavailability for drugs where water solubility is the primary limitation to absorption. The research undertaken in this thesis examines the use of different types and mass of lipids to improve drug solubilisation and absorption, and investigates the contribution of gastric processing to the improvements in oral bioavailability typically seen after co-administration of poorly soluble drugs with lipids and lipid-based formulations. A simple in vitro lipolysis model was used to assess the effect of lipid type and mass on the solubilisation of three model lipid-soluble compounds (dansazol, clomiphene and halofantrine). Dissolution of medium chain triglycerides (MCT) lipid-based formulations, drug concentrations in the aqueous phase of the digests were higher after digestion of the smallest lipid mass, regardless of drug lipophilicity. In all cases, digestion of the LCT formulations resulted in a 40-60% increase in the mass of drug solubilised, whereas for the SEDDS formulations, drug solubilisation increased by a much smaller 5-10%. The more lipophilic drugs, partitioning into the residual oil phase increased. Drug lipophilicity, the choice and quantity of lipid, and the need for complete digestion of the formulation were therefore important factors to consider. In addition, the approach was also shown to be suitable for high dose administration of lycopene. The study showed the potential of lipid-based formulations not to affect oral bioavailability, and linear pharmacokinetics were observed. When the lycopene ratio was increased, Cmax concentration increased at lipid doses from 50 mg to 250 mg, but did not increase further beyond 250 mg. The data suggest that the type and mass of lipid co-administered are important, but that in most cases, LCT formulations outperform the equivalent MCT formulations. One of the main advantages of SEDDS is that they can be given by oral administration forms as both a liquid and solid dosage form. SEDDS have also been used in various pharmaceutical applications and are under consideration for the delivery of water-insoluble drugs. Bioavailability. Cmax bioavailability was reduced when either formulation was administered intraduodenally and similar trends were evident for MCT and LCT. The data suggest that gastric and intestinal processing are important for the overall administration route and that absorption of lycopene is dependent on the formulation. It should be noted that LCT gastric processing may explain the improvements in bioavailability when MCT formulations (both solution and dispersion) were administered orally when compared to intraduodenally. Surprisingly, however, the study seemingly less important the route of administration of carbohydrates and the potential of the prodrugs to increase oral bioavailability. This study demonstrates the potential of lipid-based models to predict in vivo absorption, and further shows that the mass and type of lipid, and processing in both the stomach and the intestine are important determinants of oral bioavailability from lipid-based formulations.

Nanoparticle Drug Delivery Systems As one of the most important sterol derivatives, glucocorticoids have long been recognised and their therapeutic benefits have been widely used in clinic and industry in anti-inflammatory and anti-cancer formulations. glucocorticoids regulate gene expression, control inflammation, and maintenance of the homeostasis as well as the stress response. It is not surprising that the concept of "glucocorticoids" is mentioned in almost all medical text books that focus on specific organs or systems. In the past few decades, glucocorticoids - and the neural, hormonal, immunological, and metabolic effects of glucocorticoids - have become widely recognised. The latest findings relating to glucocorticoids, either freely from the laboratory or from clinical case studies, and to open a new angle of looking at the issue of balancing the therapeutic benefits and the potential side effects of glucocorticoids.

Lipid-Based Nano-Delivery for Oral Administration of Poorly Water Soluble Drugs (IPRS/DS): Design, Optimization and In Vitro Assessment Nanosystems: Formulation, Applications, and Characterization provides detailed information on the production, characterization and performance of lipid-based drug delivery systems as presented by experts who share a wealth of experience. Those involved in the developmental, pharmaceutical and cosmetic industries will find this a useful reference as it addresses findings gained to different preparation and formulation methods of nanostructures and their application in different fields and products. As the last decade has seen a major shift from conventional emulsification processes towards nanosystems that both increase the efficiency and stability of emulsions and improve targeted drug and nutraceutical delivery, this book is a timely resource. Summaries general aspects of food nanoformulations and their applications
Water-Insoluble Drug Formulation 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 dispersion test 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 LBFX are both events that challenge the solubilisation of a co-administered drug. The data show that the development of LBFXs 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. Lipophilic co-surfactants were used in studies to enhance solubilisation of poorly water-soluble 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 thesis 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.

Drug Targeting Technology 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 pharmacology, it is an important reference for those working in the field of pharmaceutical industries and academic researchers. It provides a framework to understand how on 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 Assessment of the pros and cons of using different lipid nanocarriers for different therapies.

Nanomedicine 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.

Application of Nanotechnology in Drug Delivery 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

Recent Advances in Novel Drug Carrier Systems Nanosystems for Drug Delivery extensively covers the various nanostructured products that have been tested as carriers in targeted 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 nanostructured 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 versatile application nature of nanotechnology, it is the right time to come up with an efficient and effective way. This book allows readers to get up-to-date, state-of-the-art work that highlights the principal mechanical 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 nanomaterials are successfully employed in drug delivery systems as and 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 nanotechnology in drug delivery and shows how the application of nanomachines have improved the efficiency of drug delivery systems, showing medical scientists how they are beneficial in

In Vitro Drug Release Testing of Special Dosage Forms Leading experts survey the currently available technologies designed to improve the delivery of today’s cancer chemotherapy agents. The authors review the theoretical and practical considerations governing conventional and nonconventional methods of drug administration, and identify promising opportunities for product development. In their outline and discussion of the use of novel formulation technologies—including synthetic polymers and biomaterials for prolonged or sustained drug release to achieve potentially greater therapeutic effect-they profile those technologies that have resulted in a number of approved and late-stage clinical products.

Application of Formulation and Physiological Monitoring on the Behaviour of Lipid-based Formulations for Poorly Water-soluble Drugs Developing Solid Oral Dosage Forms is intended for pharmaceutical professionals engaged in research and development of oral dosage forms, covering essential principles of physical pharmacy, biopharmaceutics and industrial pharmacy as well as various aspects of state-of-the-art techniques and approaches in pharmaceutical sciences and technologies along with examples and use cases in product development. The objective of this book is to provide a current and comprehensive guide for rational development of solid oral dosage forms. The specific goals is to provide readers with: Basics of modern theories of physical pharmacy, biopharmaceutics and industrial pharmacy and their applications throughout the entire process of research and development of oral dosage forms Tools and approaches of preformulation investigation, formulation/process design, characterization and scale-up in pharmaceutical sciences and technologies New developments, challenges, trends, opportunities, intellectual property issues and regulations in solid product development The book is a comprehensive and in-depth coverage of what’s required for developing high quality pharmaceutical products to meet international standards It covers a broad scope of topics that encompass the entire spectrum of solid dosage form development for the global market, including the most recent advances, technologies, practices and use cases with new developments, regulatory issues, and industry standards in every chapter. A strong team of more than 50 well-established authors/co-authors of diverse background, knowledge, skills and experience from industry, academia and regulatory agencies

Oral Drug Absorption The problem of clinical pain management is complex and far-reaching, as it encompasses many different types of pain, such as arthritis, musculoskeletal conditions, neuropathic pain, and oral drug administration. It is widely known that drugs are generally based on the well-established and defined matrix. However, pain can also be effectively controlled by peripheral pathways. The analgesics market is growing and the driving forces are the aging population and need for better therapeutic benefits. There are various analgesic forms that are available and can be administered by various routes, yet research is active in identifying new technologies for better drug targeting and novel targets to gain improved therapeutic efficiency. This e-book “PAIN - novel targets and new technologies” has brought together experts in the field of pain at the physiological, pharmacological and pharmaceutical levels to discuss the novel and emerging pain targets that have been presented as novel research findings, short communications and review articles. The goal of this e-book is to generate further collaborative discussion on the future and direction of pain therapies.

Multifunctional Nanocarriers for Contemporary Healthcare Applications This comprehensive resource covers the fundamentals, formulation, and biopharmaceutical issues of lipid-based drug delivery. It presents the principles of liposome absorption and covers formulation issues, such as dissolution testing and stability testing, and physiological and biopharmaceutical issues, including the role of specific enzymes, the evaluation of transport systems in the body, and the mechanisms governing the transport of water-insoluble drugs.

Application of Ionic Liquids in Drug Delivery With the advent of analytical techniques and capabilities to measure particle sizes in nanometer ranges, there has been tremendous interest in the use of nanoparticulate formulations for many different applications. Nanoparticulate Drug Delivery Systems addresses the scientific methodologies, formulation, processing, applications, recent trends, and a

PAIN - Novel targets and new technologies 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.

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