



Pharmaceutical Applications of Cell and Tissue Culture to Drug Transport

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Pharmaceutical Applications Of Cell And Tissue Culture To Drug Transport

A. Claudio Cuello, Brian Collier



Pharmaceutical Applications Of Cell And Tissue Culture To Drug Transport:

Pharmaceutical Applications of Cell and Tissue Culture to Drug Transport Glynn Wilson, S.S. Davis, L. Illum, Alain Zweibaum, 2012-12-06 In recent years there have been rapid advances in the growth and differentiation of mammalian cells in culture. This has led to increasing use of such in vitro systems in a wide variety of studies on fundamental aspects of cell structure and function including normal growth and metabolism, mechanisms of differentiation and oncogenesis, mechanisms of protein and membrane synthesis and cell polarity. Recent advances in our ability to grow cells including human cells on permeable supports to generate confluent cellular barriers with the morphological polarity corresponding to their in vivo counterparts has greatly facilitated such studies. In particular, these new techniques have led to an increasing interest in the use of cell and tissue culture systems as a means for examining the transport of drugs across epithelial and endothelial barriers. An obvious question is whether these new in vitro methodologies will provide convenient systems that can substitute for and replace animal models. Various research groups both in academia and in the pharmaceutical industry have been investigating these types of methodologies in order to develop convenient well characterized systems that can be used to examine basic aspects of transcellular transport and to evaluate the permeability of drug molecules and delivery systems. Of particular note is use of confluent cell layers to study the transport of large molecules such as peptides and proteins produced through recombinant DNA technology.

Peptide Transport and Delivery into the Central Nervous System

Laszlo Prokai, Katalin Prokai-Tatrai, 2012-12-06 Hypo or hypersecretion, alteration in storage, release, catabolism and post translational processing of neuropeptides are associated with the etiology of many diseases affecting the central nervous system (CNS). Various peptides native to the brain and the spinal cord as well as various synthetic peptides, peptide analogues and peptidomimetics developed as their agonists or antagonists could be useful in the treatment of these CNS maladies. However, peptides face a formidable obstacle in reaching the intended site of action due to the existence of the blood brain barrier (BBB), a vital element in the regulation of the internal environment of the brain and the spinal cord. After reviews on the role and neuropharmaceutical potential of peptides, properties of the BBB in the context of peptide transport in the CNS and potential transport mechanisms to cross the BBB, this volume discusses the development, present state of the art and future trends of various strategies to overcome this major obstacle to peptide pharmacotherapy involving the CNS. Chapters are devoted to cover invasive approaches that circumvent the BBB by direct administration into the brain or the spinal cord and by transiently opening the tight junctions of or permeabilizing the endothelial cells separating the systemic circulation from the interstitial fluid of the CNS. Subsequently, physiologically based strategies that utilize biological carriers to gain access to the CNS are discussed in detail, followed by methods encompassing prodrug and chemical delivery targeting strategies which aim at altering the properties of the peptide to enhance BBB transport and drug delivery strategies based on peptide vectors. Finally, a comparative evaluation on the present status and perspectives of the techniques is presented.

Drug Delivery to

the Oral Cavity Tapash K. Ghosh, William R. Pfister, 2005-02-28 With contributions from recognized authorities in industry academia and government this reference presents the state of the art in the testing formulation and clinical evaluation of intraoral drug delivery products summarizing intraoral dosage forms in various stages of research as well as products currently on the market *Analytical Techniques in the Pharmaceutical Sciences* Anette Müllertz, Yvonne Perrie, Thomas Rades, 2016-08-30 The aim of this book is to present a range of analytical methods that can be used in formulation design and development and focus on how these systems can be applied to understand formulation components and the dosage form these build To effectively design and exploit drug delivery systems the underlying characteristic of a dosage form must be understood from the characteristics of the individual formulation components to how they act and interact within the formulation and finally to how this formulation responds in different biological environments To achieve this there is a wide range of analytical techniques that can be adopted to understand and elucidate the mechanics of drug delivery and drug formulation Such methods include e g spectroscopic analysis diffractometric analysis thermal investigations surface analytical techniques particle size analysis rheological techniques methods to characterize drug stability and release and biological analysis in appropriate cell and animal models Whilst each of these methods can encompass a full research area in their own right formulation scientists must be able to effectively apply these methods to the delivery system they are considering The information in this book is designed to support researchers in their ability to fully characterize and analyze a range of delivery systems using an appropriate selection of analytical techniques Due to its consideration of regulatory approval this book will also be suitable for industrial researchers both at early stage up to pre clinical research

Pharmacological Sciences: Perspectives for Research and Therapy in the Late 1990s A. Claudio Cuello, Brian Collier, 2012-12-06 This volume arose from the scientific program of the XIIth International Congress of Pharmacology held in Montreal Canada July 24 29 1994 The scientific program included plenary lectures and symposia in addition to poster presentations and colloquia The abstracts of the Congress presentations were published as supplement 1 of volume 72 by the Canadian Journal of Physiology Dr Brian Collier was chair of the scientific program committee and thus also collaborated on this work The objective that we pursued was to produce a volume of reasonable size which would feature all of the plenary lectures and symposia from those authors who agreed to participate To this end we solicited mini reviews from plenary lecturers and asked symposia organizers to coordinate a single short review covering the individual topics within their event Those who accepted this challenge are evident in this volume We express our gratitude to these authors for doing so and for exercising considerable ingenuity in completing their task within a reasonable time **Models for Assessing Drug**

Absorption and Metabolism Ronald T. Borchardt, Philip L. Smith, Glynn Wilson, 2013-06-29 Pharmaceutical scientists in industry and academia will appreciate this single reference for its detailed experimental procedures for conducting biopharmaceutical studies This well illustrated guide allows them to establish validate and implement commonly used in situ

and in vitro model systems Chapters provide ready access to these methodologies for studies of the intestinal buccal nasal and respiratory vaginal ocular and dermal epithelium as well as the endothelial and elimination barriers

Recent Progress in Nanobiotechnology P. M. Visakh, Oguz Bayraktar, 2024-06-30 This book describes recent important advancements in nanobiotechnology for biomedical applications as well as explaining fundamentals and examining potential applications in biomedical settings Nanobiotechnology is the study of applications of nanotechnologies in biological or biomedical settings It is an interdisciplinary field of growing importance whose subcategories encompass chemical engineering molecular biophysics and cellular mechanics or tissue engineering This book is structured in a way to summarize the latest process in nanobiotechnology at the molecular cellular tissue and organ levels The principles of the underlying science are presented and widely accepted applications in the field and newly designed techniques are extensively described Fresh insights are provided into the convergence of science and technology This book is an ideal guide to the field that will be of value especially for researchers from interdisciplinary fields and higher level graduate students with extraordinary inspirations and research training

Biomaterials, Medical Devices, and Combination Products Shayne Cox Gad, Samantha Gad-McDonald, 2015-12-01 Biomaterials Medical Devices and Combination Products is a single volume guide for those responsible for or concerned with developing and ensuring patient safety in the use and manufacture of medical devices The book provides a clear presentation of the global regulatory requirements and challenges in evaluating the biocompatibility and clinical

Recombinant DNA Research, 1995 Safety Evaluation in the Development of Medical Devices and Combination Products Shayne C. Gad, Marian G. McCord, 2008-10-20 Capturing the growth of the global medical device market in recent years this practical new guide is essential for all who are responsible for ensuring safety in the use and manufacture of medical devices It has been extensively updated to reflect significant advances incorporating combination products and helpful case examples of current real l

Mechanistic Studies on the Enhanced Mucosal Transport of Human Growth Hormone by Certain Amino Acid Derivatives Sy-Juen Wu, 1999

Drug Epidemiology and Post-Marketing Surveillance Brian L. Strom, G.P. Velo, 2013-06-29 This volume is a summary of material presented in the course given in the International School of Pharmacology on Drug Epidemiology and Post Marketing Surveillance between September 27 and October 8 1990 at the Ettore Majorana Center for Scientific Culture in Erice Sicily The course which was a NATO Advanced Study Institute included lectures and workshops presented by experts in the new field of pharmacoepidemiology The material covered includes various approaches to spontaneous reporting of adverse drug reactions including aggregate approaches such as those used in France and detailed analyses of individual reports such as that done in The Netherlands and in Sweden Also included are studies using traditional epidemiology methods In addition modern pharmacoepidemiology makes considerable use of automated databases As such information is presented on their use as well Pharmacoepidemiology started in hospitals and some of the newest work in the field is returning to the hospital as a site for

studies Material on these topics was presented as well Finally selected new methodologic developments were outlined in specific examples presented that were of regulatory and commercial importance This new field of phannacoepidemiology is exploding in interest internationally Evidence of this is the increasing development of pharmacoepidemiology programs in industry medical schools pharmacy schools and schools of public health Also there is a new International Society ofPhannacoepidemiology Practitioners in this field tend to specialize in either analyses of spontaneous reporting or the use of formal epidemiologic techniques

Pharmaceutical Nanotechnology Jean Cornier,Andrew Owen,Arno Kwade,Marcel Van de Voorde,2016-11-28 Dieses Fachbuch legt den Schwerpunkt auf konkrete Methoden und die j ngsten Fortschritte bei der Anwendung von Nanotechnologie f r die Entwicklung neuer medikament ser Therapieans tze und die medizinische Diagnostik Von den Grundlagen der Nanopharmazie einschlie lich Charakterisierung und Herstellungsverfahren bis hin zur Rolle von Nanopartikeln und Wirkstoffen wird das Fachgebiet umfassend dargestellt Anwendungsbeispiele beziehen sich auf Fragestellungen bei der Medikamentenentwicklung und die bertragung auf die klinische Praxis Marktchancen und Aspekte der industriellen Vermarktung Die beschriebenen Anwendungen stammen aus der Behandlung von Krebserkrankungen und weiteren wichtigen Therapiebereichen wie Infektionskrankheiten und Dermatologie Abgerundet wird das Fachbuch durch eine ausf hrliche Er rterung sicherheitsrelevanter rechtlicher und gesellschaftlicher Fragen Geschrieben von einem erstklassigen Team von Herausgebern und Autoren die zu den f hrenden Experten in Europa und den USA sowie zu den Pionieren der Nanopharmazie geh ren

Safety Evaluation of Medical Devices Shayne C. Gad,2001-12-04 Capturing the growth of the global medical device market in recent years this practical new guide is essential for all who are responsible for ensuring safety in the use and manufacture of medical devices It has been extensively updated to reflect significant advances incorporating combination products and helpful case examples of current real life problems in the field The Third Edition explores these key current trends global device markets continually advancing technology the increasing harmonization of device safety regulation worldwide Each aspect of safety evaluation is considered in terms of International Standards Organization ISO US Food and Drug Administration FDA European Union EU and Japanese Ministry of Health and Welfare MHW perspectives In addition the book reflects the role of the continuing growth of technology in the incorporation of science particularly in the areas of immunotoxicology and toxicokinetics

Current Catalog National Library of Medicine (U.S.),1992 First multi year cumulation covers six years 1965 70

DERMATOTOXICOLOGY 4ED Francis Nicholas Marzulli,Howard I. Maibach,1991-06-01 A guide to the field of dermatotoxicology This edition includes fundamental information on the mechanisms of action of toxic substances on skin as well as practical information on the varied responses of skin to specific toxic substances and approaches to evaluating dermal toxicity Other topics discussed include hostile natural elements such as ultraviolet radiation poisonous plants man made detergents and chemicals problems associated with chronic occupational skin exposure to toxic chemicals animal alternative research programmes carcinogenic and Photo

Carcinogenic Potential Of Xenobiotic Chemicals Oculotoxicity Risk assessment and management and cosmetic safety
Anatomical factors affecting barrier functions lipids of the permeability barrier the skin immune system *In Vitro Toxicology, Second Edition* Shayne C. Gad, 2000-11-02 Toxicology has made tremendous strides in the sophistication of the models used to identify and understand the mechanisms of agents that can harm or kill human and other higher organisms. Non animals or in vitro models started to gain significant use in the 1960s. As a result of the increased concern over animal welfare economic factors and the need for greater sensitivity and understanding of mechanisms interest in in vitro models has risen. This volume demonstrates that there now exists a broad range of in vitro models for use in either identifying or understanding most forms of toxicity. The availability of in vitro models spans both the full range of endpoints irritation sensitization lethality mutagenicity and developmental toxicity and the full spectrum of target organ systems skin eye heart liver kidney nervous system etc. Chapters are devoted to each of these speciality areas from a perspective of presenting the principal models and their uses and limitations. Chapters that overview the principles involved in the general selection and use of models and that address the issues of safety concerns and regulatory acceptance of these methods are also included.

Acute Toxicology Testing Shayne C. Gad, Christopher P. Chengelis, 1997-10-27 Acute toxicology testing provides the first line of defense against potentially dangerous chemicals. This book is a complete and practical guide to conducting and interpreting all regulatory required and commonly used acute toxicity tests. It presents detailed protocols for all of the common test designs and reviews their development and objectives. *Acute Toxicology Testing Second Edition* will interest not only workers in the pharmaceutical industry but also researchers and students in toxicology and public health. **Key Features** Over 100 tables summarizing and interpreting results. Complete coverage of all major test designs and their limitations and advantages. Current status of alternative test designs and models.

Dermatotoxicology Methods Francis N. Marzulli, Howard I. Maibach, 2019-05-07 This work presents and evaluates methods employed to identify the potential of certain types of chemicals to adversely affect the skin. A variety of test methods are included such as tests for skin penetration metabolism irritation the skin immune system photo effects skin cancer and topical effects of retinoids and depigmenting chemicals. Tests for chemicals that affect the reproductive and nervous system are also included. Both animal and human tests that have been standardised and tests that are under development and employ animal alternatives are addressed in this book. Besides different testing methods a rationale for accepting non animal models and a review of some regulatory agency discussions about animal alternative tests are included. **New Trends in Pharmacokinetics** Aldo Rescigno, Ajit K. Thakur, 2012-12-06 The last decade or so has witnessed tremendous progress in methodology in the field of drug development in general and pharmacokinetics in particular. Clinical pharmacokinetics is using new tools for probing into the black box once being accessible only partly through experimental techniques and mostly through mathematical and computer means. Development of computerized scanning positron emission tomography PET stereoselectivity and other

techniques are now enabling investigators to have better pictures of the systems they are studying. Mathematical models through computer simulation and statistical estimation, mostly due to easy access because of inexpensive yet powerful personal computers, are enabling us to investigate ultrastructures and their functional connectivity in more detail. As a consequence, new hypotheses are being formed and tested in various related fields. In clinical pharmacokinetics, mostly due to mathematical modeling, more accurate interspecies scaling of pharmacokinetic parameters and dosimetry can be done now a days. The concept of a human is a bigger rat does not necessarily fly as a consequence. Pharmacokinetic concepts are becoming powerful tools in meaningful carcinogenic and toxic risk extrapolation of different chemicals in humans. New dose delivery designs are being formulated using pharmacokinetic techniques for different pharmaceutical compounds. Investigations continue in the academia, research institutions, pharmaceutical, biotechnological and agricultural industries in developmental and physiological aspects of different chemicals for the benefit of mankind. The idea of a school on New Trends in Pharmacokinetics from which the present publication was made possible took shape over almost a year.

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