

Liposomes, Lipid Bilayers and Model Membranes

From Basic Research to Application



Edited by
Georg Pabst
Norbert Kučerka
Mu-Ping Nieh
John Katsaras



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Liposomes Lipid Bilayers And Model Membranes From Basic Research To Application

H.T. Tien †, A. Ottova-Leitmannova



Liposomes Lipid Bilayers And Model Membranes From Basic Research To Application:

Liposomes, Lipid Bilayers and Model Membranes Georg Pabst, Norbert Kucerka, Mu-Ping Nieh, John Katsaras, 2014-03-04
As a result of their unique physical properties biological membrane mimetics such as liposomes are used in a broad range of scientific and technological applications *Liposomes Lipid Bilayers and Model Membranes From Basic Research to Application* describes state of the art research and future directions in the field of membranes which has evolved from basic studies of the physicochemical properties of amphiphiles to their application in industry and medicine Written by leading researchers in their fields this book describes basic and applied research and serves as a useful reference for both the novice and the expert Part one covers a range of basic research topics from theory and computational simulations to some of the most up to date experimental research Topics discussed include soft matter physics of membranes nonlamellar phases extraction of molecules by amphiphiles lipid models for membrane rafts membrane dynamics nanodiscs microemulsions active membranes as well as interactions of bilayers with drugs or DNA to treat disease or for gene transfer respectively Part two of the book focuses on technological applications of amphiphiles such as liposome based nanoparticles for drug delivery formulation of liposomes for prolonged in vivo circulation and functionalization for medical purposes novel drug delivery systems for increased drug loading and the use of tethered membranes for bio sensing applications Chapters also describe the use of liposomes in textile dyeing and how lipidic nanoparticles are used by the food industry

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Novel Drug Delivery Systems for Phytoconstituents Madhu Gupta, Durgesh Nandini Chauhan, Vikas Sharma, Nagendra Singh Chauhan, 2019-07-23 Novel Drug Delivery Systems for Phytoconstituents discusses general principles of drug targeting construction material and technological concerns of different phytoconstituent in delivery systems It focuses on the development of novel herbal formulations and summarizes their method of preparation type of active ingredients route of administration biological activity and their applications It discusses therapeutic activities of plant derived chemicals their limitations in clinical applications and novel drug delivery solutions to overcome them to provide better therapeutic effects with controlled and targeted drug delivery Focus on drug delivery of phytomolecules Act as bridge between natural product scientist and clinical doctors Discusses mechanism of poor bioavailability of herbal molecules Increases awareness towards phytochemical efficacy Summarizes efficient novel delivery systems based formulations It extensively covers the applications of novel drug delivery systems including polymeric nanoparticles solid lipid nanoparticles nanostructured lipid capsules liposomes phytosomes microsphere transferosomes and ethosomes Some chapters are especially focused on anticancer phytodrugs silymarin

andrographolide berberine and curcumin delivery with special emphasis on their application **Comprehensive Biomaterials II** Kevin Healy,Dietmar W. Hutmacher,David W. Grainger,C. James Kirkpatrick,2017-05-18 Comprehensive Biomaterials II Second Edition Seven Volume Set brings together the myriad facets of biomaterials into one expertly written series of edited volumes Articles address the current status of nearly all biomaterials in the field their strengths and weaknesses their future prospects appropriate analytical methods and testing device applications and performance emerging candidate materials as competitors and disruptive technologies research and development regulatory management commercial aspects and applications including medical applications Detailed coverage is given to both new and emerging areas and the latest research in more traditional areas of the field Particular attention is given to those areas in which major recent developments have taken place This new edition with 75% new or updated articles will provide biomedical scientists in industry government academia and research organizations with an accurate perspective on the field in a manner that is both accessible and thorough Reviews the current status of nearly all biomaterials in the field by analyzing their strengths and weaknesses performance and future prospects Covers all significant emerging technologies in areas such as 3D printing of tissues organs and scaffolds cell encapsulation multimodal delivery cancer vaccine biomaterial applications neural interface understanding materials used for in situ imaging and infection prevention and treatment Effectively describes the many modern aspects of biomaterials from basic science to clinical applications *Characterization of Biological Membranes* Mu-Ping Nieh,Frederick A. Heberle,John Katsaras,2019-07-22 The study of membranes has become of high importance in the fields of biology pharmaceutical chemistry and medicine since much of what happens in a cell or in a virus involves biological membranes The current book is an excellent introduction to the area which explains how modern analytical methods can be applied to study biological membranes and membrane proteins and the bioprocesses they are involved to *Nanostructured Materials and Nanotechnology* Hari Singh Nalwa,2002 Nanotechnology Provides comprehensive coverage of the dominant technology of the 21st century Written by a truly international list of contributors *Handbook of Nanostructured Materials and Nanotechnology, Five-Volume Set* Hari Singh Nalwa,1999-10-29 Nanostructured materials is one of the hottest and fastest growing areas in today s materials science field along with the related field of solid state physics Nanostructured materials and their based technologies have opened up exciting new possibilities for future applications in a number of areas including aerospace automotive x ray technology batteries sensors color imaging printing computer chips medical implants pharmacy and cosmetics The ability to change properties on the atomic level promises a revolution in many realms of science and technology Thus this book details the high level of activity and significant findings are available for those involved in research and development in the field It also covers industrial findings and corporate support This five volume set summarizes fundamentals of nano science in a comprehensive way The contributors enlisted by the editor are at elite institutions worldwide Key Features Provides comprehensive coverage of the

dominant technology of the 21st century Written by 127 authors from 16 countries making this truly international First and only reference to cover all aspects of nanostructured materials and nanotechnology

Liposomes in Drug Delivery Sophia G. Antimisiaris, 2024-04-10 Liposomes in Drug Delivery What Where How and When to Deliver is a concise well structured reference covering all the important issues related to the potential of this technology Organized to provide practical information to researchers from any discipline with a particular therapeutic or bio active substance to deliver this book helps readers understand if liposomes can be of benefit for their particular need what is the best type of liposome to use according to what needs to be delivered where when to deliver it and how to design prepare characterize investigate optimize liposome properties for a particular application The book is structured in Four parts The first covers in a concise but in depth way what liposomes are which are the liposome types advantages disadvantages and what is their stability characterization methods in vitro stability and in vivo fate after different administration methods routes The second part focuses on the different mechanisms for liposomal drug delivery Methodologies technologies for manipulation of liposome structure properties in order to design liposomes for particular delivery applications Specific roadmaps for liposome design are discussed including components to incorporate in liposomes for specific types of encapsulated molecules or specific routes of administration The third part covers liposome applications for drug delivery It focuses on specific delivery considerations for particular diseases Finally the fourth part covers methods of liposome fabrication Focuses on key information What Where How and When to deliver needed for drug delivery researchers Covers all aspects of liposomes in drug delivery in one single volume Guides researchers through the decision process on whether and what liposomes are most applicable to their particular interest

Biomolecular Films James F. Rusling, 2003-02-26 This text examines films of biomolecules that can provide solid surfaces for catalyzing enzyme reactions serve in biosensors and as biorecognition elements mediate nanoparticle formation and provide a basis for fundamental studies and applications in biomedicine and biomedical devices

Nanomaterials in Daily Life Zhympargul Abdullaeva, 2017-06-13 This book describes nanomaterials used and existing in the environment food industry and packaging health care products and cosmetics housekeeping nanomaterials for cleaning purposes architectural building products medicine clothing and textile smart electronics and sensors Each chapter provides basic knowledge on synthesis of nanomaterials by biological approaches Fundamental terms are defined followed by explanations examples visual photographs schemes and illustrations

Food Safety and Preservation Alexandru Mihai Grumezescu, Alina Maria Holban, 2018-04-18 Food Safety and Preservation Modern Biological Approaches to Improving Consumer Health explores the most recent and investigated hot topics in food safety microbial contamination food borne diseases and advanced preservation methods It brings together the significant evidence based scientific progress of various approaches to improve the safety and quality of foods also offering solutions to help address food industry challenges Recent studies and technological advancements in biological control are presented to control

foodborne pathogens In addition analytical methods for reducing potential biological hazards make this book essential to researchers scientists technologists and grad students Covers all aspects of food contamination from food degradation to food borne diseases Examines validated biological control approaches to reduce microbial and chemical contamination Includes detailed discussions of risk and safety assessments in food preservation

Handbook of Natural Antimicrobials for Food Safety and Quality M Taylor, 2014-11-04 Natural additives are increasingly favoured over synthetic ones as methods of ensuring food safety and long shelf life The antimicrobial properties of both plant based antimicrobials such as essential oils and proteins such as bacteriocins are used in for example edible preservative films in food packaging and in combination with synthetic preservatives for maximum efficacy New developments in delivery technology such as nanoencapsulation also increase the potential of natural antimicrobials for widespread use in industry Part one introduces the different types of natural antimicrobials for food applications Part two covers methods of application and part three looks at determining the effectiveness of natural antimicrobials in food Part four focuses on enhancing quality and safety and includes chapters on specific food products Reviews different types of antimicrobials used in food safety and quality Covers how antimicrobials are created to be used in different foods Examines how the antimicrobials are used in foods to enhance the safety and quality

The Giant Vesicle Book Rumiana Dimova, Carlos Marques, 2019-11-19 Giant vesicles are widely used as a model membrane system both for basic biological systems and for their promising applications in the development of smart materials and cell mimetics as well as in driving new technologies in synthetic biology and for the cosmetics and pharmaceutical industry The reader is guided to use giant vesicles from the formation of simple membrane platforms to advanced membrane and cell system models It also includes fundamentals for understanding lipid or polymer membrane structure properties and behavior Every chapter includes ideas for further applications and discussions on the implications of the observed phenomena towards understanding membrane related processes The Giant Vesicle Book is meant to be a road companion a trusted guide for those making their first steps in this field as well as a source of information required by experts Key Features A complete summary of the field covering fundamental concepts practical methods core theory and the most promising applications A start up package of theoretical and experimental information for newcomers in the field Extensive protocols for establishing the required preparations and assays Tips and instructions for carefully performing and interpreting measurements with giant vesicles or for observing them including pitfalls Approaches developed for investigating giant vesicles as well as brief overviews of previous studies implementing the described techniques Handy tables with data and structures for ready reference

Nanoparticles for Rational Vaccine Design Harvinder Singh Gill, Richard W. Compans, 2021-08-30 This book introduces nanoparticles as a powerful platform for vaccine design Current challenges in vaccine development are discussed and the unique advantages nanoparticles provide in overcoming these challenges are explored The authors offer fascinating insights into the immunological assets of using nanoparticles as

delivery vehicles or adjuvants and present different materials that are being used in nanoparticle based vaccine development covering peptides proteins polymers virus like particles and liposomes Its contemporary research insights and practical examples for applications make this volume an inspiring read for researchers and clinicians in vaccinology and immunology Chapter Liposome Formulations as Adjuvants for Vaccines is available open access under a Creative Commons Attribution 4.0 International License via link springer.com

Advances in Planar Lipid Bilayers and Liposomes A. Leitmannova Liu, 2006-04-25 The lipid bilayer is central to life as all living organisms possess a lipid bilayer structure thereby underlying the lipid bilayer principle of biomembranes The lipid bilayer principle and its applications are the main theme of this new book series This new series on bilayer lipid membranes BLMs and liposomes include invited chapters on a broad range of topics from theoretical investigations specific studies experimental methods to practical applications Written for newcomers experienced scientists and those who are not familiar with these specific research areas the Series covers all aspects of lipid bilayer investigations both fundamental and applied Covers a broad range of topics ranging from theoretical research specific studies experimental methods to practical applications Authoritative timely reviews by experts in this field Indispensable source of information for new scientists

Membrane Biophysics: As Viewed from Experimental Bilayer Lipid Membranes H.T. Tien †, A. Ottova-Leitmannova, 2000-01-11 This book summarizes the current status of research on bilayer lipid membranes planar lipid bilayers and spherical liposomes In addition to describing the properties of lipid bilayers and examining biomembrane phenomena the book has two other objectives The first is to present practical methods for the formation and study of lipid bilayers with either aqueous or metal lipid bilayer interfaces The second aim is to treat planar lipid bilayers as a new type of interfacial adsorption phenomena The first nine chapters cover properties of biomembranes basic principles of membrane biophysics transport electrochemistry physiology bioenergetics and photobiology Chapter 10 presents the following topics lipid bilayers in medicine supported lipid bilayers as sensors a short discussion of liposomes and solar energy transduction via semiconductor septum photovoltaic cells based on natural photosynthesis

Medical Applications of Liposomes D.D. Lasic, D. Papahadjopoulos, 1998-07-22 The development of liposomes as a drug delivery system has fluctuated since its introduction in the late 1960 s by A D Bangham While academic research of liposomes as a model membrane system has always flourished as the exponential growth of papers can testify the application of these findings to medically useful products has gone through several crises Following the original optimism in the 70 s and early 80 s a period of severe skepticism ensued at the end of the 80 s and beginning of the 90 s culminating in a moderate but real optimism in the mid 90 s as a result of a successful launch of the first products in the US and Europe In this collection of papers the editors have gathered the most promising ideas approaches applications and commercial developments thereby presenting an up to date compilation of the present status of the field This includes such broad areas as anti cancer chemotherapy immune stimulation and infectious diseases Currently the major areas of progress are in delivery of anti fungal

agents by conventional liposomes or lipid based carriers and systemic anticancer therapy using long circulating liposomes The future applications as characterized by the direction of present day research is in specific targeting and delivery of informational molecules such as DNA plasmids genes antisense oligonucleotides or ribozymes Other future developments may be in topical delivery vaccination and in diagnostics Features of this book Contributions from almost all the leading labs in the field Up to date critical reviews bridged by editors introductions Organized into a logical framework Glycobiology and Human Diseases Gherman Wiederschain,2016-02-22 This book discusses glycobiology and various forms of human diseases Topics covered include immunoglobulins inflammation and glycosylation the role and therapeutic significance of natural anti glycan antibodies in malignancies and in normal and aberrant pregnancy identifying urinary glycans as a possible method for the diagnosis of lysosomal st **21st Century Nanoscience - A Handbook** Klaus D.

Sattler,2019-11-26 This up to date reference is the most comprehensive summary of the field of nanoscience and its applications It begins with fundamental properties at the nanoscale and then goes well beyond into the practical aspects of the design synthesis and use of nanomaterials in various industries It emphasizes the vast strides made in the field over the past decade the chapters focus on new promising directions as well as emerging theoretical and experimental methods The contents incorporate experimental data and graphs where appropriate as well as supporting tables and figures with a tutorial approach **Proceedings of the Fifth International Symposium on Protection Against Chemical and Biological Warfare Agents** DIANE Publishing Company,1996-06 Includes a keynote address and sections on detection decontamination and destruction body protection filters and filtration respiratory protection and medical protection This supplement contains full papers presented at the symposium but not published in the proceedings as well as abstracts of papers presented at the poster session It also contains an author index for all five symposia

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