

HANDBOOK OF LIPID BILAYERS

SECOND EDITION

Derek Marsh

Crc Handbook Of Lipid Bilayers

Richard Bailey



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Hdbk of Lipid Bilayers Derek Marsh,1990-10-24

Handbook of Lipid Bilayers, Second Edition Derek

Marsh,2013-02-15 Now in its second edition the Handbook of Lipid Bilayers is a groundbreaking work that remains the field's definitive text and only comprehensive source for primary physicochemical data relating to phospholipid bilayers Along with basic thermodynamic data coverage includes both dynamic and structural properties of phospholipid bilayers It is an indispensable reference for users of bilayer model membranes and liposome delivery systems and for those interested in the biophysics of membrane structure Each chapter in the second edition contains considerable amounts of explanation and elaboration including in many cases extensive analysis of structural connections between the data New in the Second Edition Chapters on crystal structures of phospholipids include new structures and more comprehensive data on bond lengths bond angles and torsion angles and all coordinates are Cartesian Wide angle data is indexed whenever possible to characterize chain packing modes in gel and crystalline lamellar phases Low angle data are analyzed in terms of the lipid and water thicknesses Headgroup separations in electron density profiles for phospholipids are included and a separate section is devoted to the in depth analysis of electron density profiles that provides the most detailed structural information on fluid lamellar phases Phase diagrams of phospholipid mixtures are vastly expanded and have been redrawn in standardized format to aid intercomparison Cholesterol including ternary systems is now featured New sections on titration calorimetry and much extended data on the temperature dependence of transfer rates The greatly expanded chapter on bilayer bilayer interactions features new and detailed information on the components of interbilayer pressures

The Lipid Handbook, Second Edition Frank D. Gunstone,John L. Harwood,Fred B. Padley,1994-07-21 A great deal of research has been carried out on this important class of compounds in the last ten years To ensure that scientists are kept up to date the editors of the First Edition of The Lipid Handbook have completely reviewed and extensively revised their highly successful original work The Lipid Handbook Second Edition is an indispensable resource for anyone working with oils fats and related substances

Handbook of Lipid Bilayers Derek Marsh,2020-07-02 Now in its second edition the Handbook of Lipid Bilayers is a groundbreaking work that remains the field's definitive text and only comprehensive source for primary physicochemical data relating to phospholipid bilayers Along with basic thermodynamic data coverage includes both dynamic and structural properties of phospholipid bilayers It is an indispensable reference for users of bilayer model membranes and liposome delivery systems and for those interested in the biophysics of membrane structure Each chapter in the second edition contains considerable amounts of explanation and elaboration including in many cases extensive analysis of structural connections between the data New in the Second Edition Chapters on crystal structures of phospholipids include new structures and more comprehensive data on bond lengths bond angles and torsion angles and all coordinates are Cartesian Wide angle data is indexed whenever possible to characterize chain packing modes in gel and crystalline lamellar phases

Low angle data are analyzed in terms of the lipid and water thicknesses Headgroup separations in electron density profiles for phospholipids are included and a separate section is devoted to the in depth analysis of electron density profiles that provides the most detailed structural information on fluid lamellar phases Phase diagrams of phospholipid mixtures are vastly expanded and have been redrawn in standardized format to aid intercomparison Cholesterol including ternary systems is now featured New sections on titration calorimetry and much extended data on the temperature dependence of transfer rates The greatly expanded chapter on bilayer bilayer interactions features new and detailed information on the components of interbilayer pressures

Structure and Dynamics of Membranes R. Lipowsky, E. Sackmann, 1995-06-15 The first volume of the Handbook deals with the amazing world of biomembranes and lipid bilayers Part A describes all aspects related to the morphology of these membranes beginning with the complex architecture of biomembranes continues with a description of the bizarre morphology of lipid bilayers and concludes with technological applications of these membranes The first two chapters deal with biomembranes providing an introduction to the membranes of eucaryotes and a description of the evolution of membranes The following chapters are concerned with different aspects of lipids including the physical properties of model membranes composed of lipid protein mixtures lateral phase separation of lipids and proteins and measurement of lipid protein bilayer diffusion Other chapters deal with the flexibility of fluid bilayers the closure of bilayers into vesicles which attain a large variety of different shapes and applications of lipid vesicles and liposomes Part B covers membrane adhesion membrane fusion and the interaction of biomembranes with polymer networks such as the cytoskeleton The first two chapters of this part discuss the generic interactions of membranes from the conceptual point of view The following two chapters summarize the experimental work on two different bilayer systems The next chapter deals with the process of contact formation focal bounding and macroscopic contacts between cells The cytoskeleton within eucaryotic cells consists of a network of relatively stiff filaments of which three different types of filaments have been identified As explained in the next chapter much has been recently learned about the interaction of these filaments with the cell membrane The final two chapters deal with membrane fusion

Bilayer Lipid Membranes. Structure and Mechanical Properties Tibor Hianik, Victor Ivanovich Passechnik, 1995-08-31 In Bilayer Lipid Membranes Structure and Mechanical Properties the authors use new methods of measurement which they have themselves developed to present an analysis of the relation between membrane structure and viscoelastic properties in particular in the transversal direction Hianik and Passechnik's approach is fundamentally different from the usual one in that they analyze lipid bilayer dynamics during various modes of deformation arriving at a new three layer model that accounts for the great heterogeneity of biomembranes The macroscopic parameters of membranes have been measured using a wide variety of methods leading to a discussion of the correlations between the parameters There is also an extensive discussion of the dynamic changes in mechanical properties of lipid bilayers in the course of conformational transition of integral proteins During the conformational changes of proteins the structure of a

bilayer undergoes a transition reaching a new stable membrane state The book is the first to present a comprehensive analysis of long distance interaction in lipid bilayers and of molecular mechanisms of mechanoreception Audience Scientists and graduate students working in biophysics membranology physiology medicine pharmacology bioelectronics electrochemistry and colloid chemistry *Thermal Biophysics of Membranes* Thomas Heimburg, 2008-02-08 An overview of recent experimental and theoretical developments in the field of the physics of membranes including new insights from the past decade The author uses classical thermal physics and physical chemistry to explain our current understanding of the membrane He looks at domain and raft formation and discusses it in the context of thermal fluctuations that express themselves in heat capacity and elastic constants Further topics are lipid protein interactions protein binding and the effect of sterols and anesthetics Many seemingly unrelated properties of membranes are shown to be intimately intertwined leading for instance to a coupling between membrane state domain formation and vesicular shape This also applies to non equilibrium phenomena like the propagation of density pulses during nerve activity Also included is a discussion of the application of computer simulations on membranes For both students and researchers of biophysics biochemistry physical chemistry and soft matter physics **National Library of Medicine Current Catalog** National Library of Medicine (U.S.), 1989 *Lipid Polymorphism and Membrane Properties* , 1997-10-02 The major lipid components of biological membranes can undergo many diverse and fascinating morphological rearrangements Studies of these diverse phases and the manner in which they are formed tends to alter the properties of ordinary bilayer membranes This book examines the structural and biological roles of lipids forming non lamellar structures Key Features Characterization of non lamellar structures Protein activity and membrane properties Analysis of membrane fusion Affect of non lamellar forming lipids on biological systems **Membrane Dynamics and Domains** Peter J. Quinn, 2013-06-29 The fluid mosaic model of membrane structure formulated by Singer and Nicolson in the early 1970s has proven to be a durable concept in terms of the principles governing the organization of the constituent lipids and proteins During the past 30 or so years a great deal of information has accumulated on the composition of various cell membranes and how this is related to the different functions that membranes perform Nevertheless the task of explaining particular functions at the molecular level has been hampered by lack of structural detail at the atomic level The reason for this is primarily the difficulty of crystallizing membrane proteins which require strategies that differ from those used to crystallize soluble proteins The unique exception is bacteriorhodopsin of the purple membrane of *Halobacterium halobium* which is interpolated into a membrane that is neither fluid nor in a mosaic configuration To date only 50 or so membrane proteins have been characterised to atomic resolution by diffraction methods in contrast to the vast data accumulated on soluble proteins Another factor that has been difficult to explain is the reason why the lipid complement of membranes is often extremely complex Many hundreds of different molecular species of lipid can be identified in some membranes Remarkably the particular composition of each membrane appears to be main

tained within relatively narrow limits and its identity distinguished from other morphologically distinct membranes

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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

The Mechanism of Lipid Bilayer Disruption by the Human Antimicrobial Peptide, LL-37 Katherine Anne Henzler Wildman, 2003 *Mechanics of the Cell* David H. Boal, 2002 Aimed at senior undergraduates and graduate students in science and biomedical engineering this text explores the architecture of a cell's envelope and internal scaffolding and the properties of its soft components The book first discusses the properties of individual flexible polymers networks and membranes and then considers simple composite assemblages such as bacteria and synthetic cells The analysis is performed within a consistent theoretical framework although readers can navigate from the introductory material to results and biological applications without working through the intervening mathematics This together with a glossary of terms and appendices providing quick introductions to chemical nomenclature cell structure statistical mechanics and elasticity theory make the text suitable for readers from a variety of subject backgrounds Further applications and extensions are handled through problem sets at the end of each chapter and supplementary material available on the Internet **Intermolecular**

and Surface Forces Jacob N. Israelachvili, 2011-07-22 Intermolecular and Surface Forces describes the role of various intermolecular and interparticle forces in determining the properties of simple systems such as gases liquids and solids with a special focus on more complex colloidal polymeric and biological systems The book provides a thorough foundation in theories and concepts of intermolecular forces allowing researchers and students to recognize which forces are important in any particular system as well as how to control these forces This third edition is expanded into three sections and contains five new chapters over the previous edition Starts from the basics and builds up to more complex systems Covers all aspects of intermolecular and interparticle forces both at the fundamental and applied levels Multidisciplinary approach bringing together and unifying phenomena from different fields This new edition has an expanded Part III and new chapters on non equilibrium dynamic interactions and tribology friction forces **Advances in Planar Lipid Bilayers and Liposomes**

, 2013-05-11 Advances in Planar Lipid Bilayers and Liposomes volumes cover a broad range of topics including main

arrangements of the reconstituted system namely planar lipid bilayers as well as spherical liposomes The invited authors present the latest results of their own research groups in this exciting multidisciplinary field Incorporates contributions from newcomers and established and experienced researchers Explores the planar lipid bilayer systems and spherical liposomes from both theoretical and experimental perspectives Serves as an indispensable source of information for new scientists

Encyclopedia of Surface and Colloid Science P. Somasundaran,2006 **Mechanics of the Cell** David Boal,2012-01-19

Exploring the mechanical features of biological cells including their architecture and stability this textbook is a pedagogical introduction to the interdisciplinary fields of cell mechanics and soft matter physics from both experimental and theoretical perspectives This second edition has been greatly updated and expanded with new chapters on complex filaments the cell division cycle the mechanisms of control and organization in the cell and fluctuation phenomena The textbook is now in full color which enhances the diagrams and allows the inclusion of new microscopy images With around 280 end of chapter exercises exploring further applications this textbook is ideal for advanced undergraduate and graduate students in physics and biomedical engineering A website hosted by the author contains extra support material diagrams and lecture notes and is available at www.cambridge.org/Boal

Protein-Lipid Interactions C.Reyes Mateo,Javier Gómez,José Villalaín,José Manuel González Ros,2008-09-30 Biological membranes have long been identified as key elements in a wide variety of cellular processes including cell defense communication photosynthesis signal transduction and motility thus they emerge as primary targets in both basic and applied research This book brings together in a single volume the most recent views of experts in the area of protein lipid interactions providing an overview of the advances that have been achieved in the field in recent years from very basic aspects to specialized technological applications Topics include the application of X ray and neutron diffraction infrared and fluorescence spectroscopy and high resolution NMR to the understanding of the specific interactions between lipids and proteins within biological membranes their structural relationships and the implications for the biological functions that they mediate Also covered in this volume are the insertion of proteins and peptides into the membrane and the concomitant formation of definite lipid domains within the membrane Emulsions, Foams, Suspensions, and Aerosols

Laurier L. Schramm,2014-10-27 This is the first book to provide an integrated introduction to the nature formation and occurrence stability propagation and uses of the most common types of colloidal dispersion in the process related industries The primary focus is on the applications of the principles paying attention to practical processes and problems This is done both as part of the treatment of the fundamentals where appropriate and also in the separate sections devoted to specific kinds of industries Throughout the treatment is integrated with the principles of colloid and interface science common to each dispersion type presented for each major physical property class followed by separate treatments of features unique to emulsions foams or suspensions The first half of the book introduces the fundamental principles introducing readers to suspension formation and stability characterization and flow properties emphasizing practical aspects throughout The

following chapters discuss a wide range of industrial applications and examples serving to emphasize the different methodologies that have been successfully applied. The author assumes no prior knowledge of colloid chemistry and with its glossary of key terms, complete cross referencing and indexing, this is a must have for graduate and professional scientists and engineers who may encounter or use emulsions, foams or suspensions or combinations thereof whether in process design, industrial production or in related R D fields.

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