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Transport And Diffusion Across Cell Membranes Molecular Biology of the Cell Diffusion in Membranes Transport and Diffusion Across Cell Membranes Quantifying the Diffusion of Membrane Proteins and Peptides Basic Equations of the Mass Transport Through a Membrane Layer Non-stationary Diffusion Through Membranes Translational diffusion of membrane components in phospholipid bilayers and biological membranes Osmosis and Diffusion Science Learning Guide Structure and Dynamics of Membranes The Kinetics of Diffusion Across Membranes Diffusion Through Membranes The Movement Of Molecules Across Cell Membranes Diffusion in Flake-filled Barrier Membranes Modulation of Lateral Diffusion on Lipid Bilayer Membranes Search for Selective Ion Diffusion Through Membranes The Diffusion of Molecules Through Membranes Principles of Biology Concepts of Biology Lateral Diffusion in Phospholipid Membranes Diffusion Processes Diffusion of Viologens Across Lipid Bilayer Membranes Size Dependence of Lateral Diffusion in Model Cell Membranes Using Fluorescently Labelled Probe Molecules [microform] Size Dependence of Lateral Diffusion in Model Cell Membranes Using Fluorescently Labelled Probe

Molecules Diffusion and Mobility of Molecules in Surface Membranes Diffusion of Proteins in Adsorptive Membranes Lateral diffusion in model membranes by pulsed nuclear magnetic resonance The Diffusion of Colloidal Electrolytes Through Membranes ... Some Factors Affecting Diffusion Through Polymer Membranes Quantifying the Diffusion of a Fluid Through Membranes by RemoteDetection MRI. Some Factors Affecting Diffusion Through Polmer Membranes The restricted diffusion of amino acids through cellulose membranes Diffusion in Hydrogel-supported Lipid Bilayer Membranes The Kinetics of Diffusion Through Collodion Membranes An Introduction to Biological Membranes An Investigation Into Interfacial Diffusion Design and Application of Dendrimer-like Molecules, I. For Diffusion in Membranes. II. As Oligomer Complexing Agents Hindered Diffusion of Ionic Micelles Through Charged Porous Membranes Diffusion in Microporous Membranes Leaflet-resolved Localization and Diffusion of Molecules Within Membranes Using Metal-induced Energy Transfer

Transport and Diffusion across Cell Membranes is a comprehensive treatment of the transport and diffusion of molecules and ions across cell membranes. This book shows that the same kinetic equations (with appropriate modification) can describe all the specialized membrane transport systems: the pores, the carriers, and the two classes of pumps. The kinetic formalism is developed step by step and the features that make a system effective in carrying out its biological role are highlighted. This book is organized into six chapters and begins with an introduction to the structure and dynamics of cell membranes, followed by a discussion on how the membrane acts as a barrier to the transmembrane diffusion of molecules and ions. The following chapters focus on the role of the membrane's protein components in facilitating transmembrane diffusion of specific molecules and ions, measurements of diffusion through pores and the kinetics of diffusion, and the structure of such pores and their biological regulation. This book methodically introduces the reader to the carriers of cell membranes, the kinetics of facilitated diffusion, and cotransport systems. The primary active transport systems are considered, emphasizing the pumping of an ion (sodium, potassium, calcium, or proton) against its electrochemical gradient during the coupled progress of a chemical reaction while a conformational change of the pump enzyme takes place. This book is of interest to advanced undergraduate students, as well as to graduate students and researchers in biochemistry, physiology, pharmacology, and biophysics. 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. An Introduction to Biological Membranes: From Bilayers to Rafts covers many aspects of membrane structure/function that bridges membrane biophysics and cell biology. Offering cohesive, foundational information, this publication is valuable for advanced undergraduate students, graduate students and membranologists who seek a broad overview of membrane science. Brings together different facets of membrane research in a universally understandable manner Emphasis on the historical development of the field Topics include membrane sugars, membrane models, membrane isolation methods, and membrane transport. The Osmosis Student Learning Guide includes self-directed readings, easy-to-follow illustrated explanations, guiding questions, inquiry-based activities, a lab investigation, key vocabulary review and assessment review questions, along with a post-test. It covers the following standards-aligned concepts: Cells - The Basic units of Life; Cell Membrane and Cell

Transport; Diffusion; Diffusion in the Lungs; Osmosis: The Diffusion of Water; Passive Transport; Active Transport; Osmosis in Plant Cells; and Osmosis in Animal Cells. Aligned to Next Generation Science Standards (NGSS) and other state standards. We present a method to measure self-diffusion acrossmembranes without the need for concentration or pressure gradients. Hyperpolarized xenon in combination with remote detection of NMR allowsthe measurement of membrane permeation, even in the gas phase. Theresulting images allow quantification of the amount of fluid diffusedthrough the membrane, and represent an alternative, potentially moreprecise way of measuring a membrane diffusion coefficient. The use ofremote detection of NMR allows for non-invasive signal encoding coupledto sensitive detection, making this approach ideal for the study ofdiffusion in intact devices such as fuel cells or separationsystems. The Principles of Biology sequence (BI 211, 212 and 213) introduces biology as a scientific discipline for students planning to major in biology and other science disciplines. Laboratories and classroom activities introduce techniques used to study biological processes and provide opportunities for students to develop their ability to conduct research. Diffusion is the most fundamental process of molecular transport in cell membranes and an important factor in maintaining its fluidity, controlling the dynamics and functioning of the membrane. In-depth knowledge of membrane dynamics and its structure is essential for understanding the functional role of membranes and all processes involving them. Therefore, a precise quantitative characterisation of diffusion in membranes is important. While Many different techniques have given insight into this matter, but they fail in addressing the dual-leaflet nature of a membrane. The experimental cha... Lipid and protein diffusion in membranes is a fundamental requirement for many signaling processes in biological cells. Therefore, measuring protein and lipid mobility in lipid bilayers with high accuracy is essential for understanding biological mechanisms. In 1975, Philip Saffman and Max Delbrück developed a model to describe protein diffusion in membranes. They predicted a logarithmic dependence of the protein's diffusion coefficient on its hydrodynamic radius. Recently, however, Gambin et al. observed a more Stokes-Einstein-like behavior, where the protein's diffusion coefficient and hy...

"Biomimetic membranes are powerful tools for fundamental studies of transmembrane proteins, and they can be used in sensing and separation technologies. This thesis presents theoretical models and experimental studies of diffusion in hydrogel-supported lipid bilayer membranes. Three hydrodynamic models are developed to assess tracer diffusion in (i) an hydrogel-supported single-leaflet membrane; (ii) a solid-supported dual-leaflet membrane; and (iii) an hydrogel-supported dual-leaflet membrane. The hydrogel-supported single-leaflet model describes transmembrane protein (tracer) diffusion in lipid bilayer membranes, and the hydrogel-supported dual-leaflet model generalizes this single-leaflet model, including inter-leaflet friction. The solid-supported dual-leaflet model allows tracers to span either one or both leaflets. The models quantify how the tracer diffusion is affected by hydrogel concentration, inter-leaflet friction, and a dimensionless parameter [LAMDA]. Thus, the models predict tracer diffusion coefficients based on key system parameters. In addition to theory, experiments were undertaken to measure lipid (PE-CF) and lipopolymer (DSPE-PEG2k-CF) self-diffusion coefficients in hydrogel-supported membranes, using fluorescence recovery after photo-bleaching (FRAP). The results show that polyacrylamide and agarose hydrogels can enhance tracer diffusion in DOPC bilayers, relative to their glass-supported counterparts. Moreover, the hydrogels impart size-exclusion and Brinkman screening effects, which may benefit membrane-based molecular-separation and sensing platforms." -- With a detailed analysis of the mass transport through membrane layers and its effect on different separation processes, this book provides a comprehensive look at the theoretical and practical aspects of membrane transport properties and functions. Basic equations for every membrane are provided to predict the mass transfer rate, the concentration distribution, the convective velocity, the separation efficiency, and the effect of chemical or biochemical reaction taking into account the heterogeneity of the membrane layer to help better understand the mechanisms of the separation processes. The reader will be able to describe membrane separation processes and the membrane reactors as well as choose the most suitable membrane structure for separation and for membrane reactor. Containing detailed discussion of the latest results in transport processes and separation processes, this book is essential for chemistry students and practitioners of chemical engineering and process engineering. Detailed survey of the theoretical and practical aspects of every membrane process with specific equations Practical examples discussed in detail with clear steps Will assist in planning and preparation of more efficient membrane structure separation A basic tenet of present day biophysics is that flows in biological systems are causally related to forces. A large and growing fraction of membrane biophysics is devoted to an exploration of the quantitative relationship between forces and flows in order to understand both the nature of biological membranes and the processes that take place on and in these membranes. This is why the discussion of the nature of diffusion is so important in any formal development of membrane bio physics. This was equally true twenty years ago when tracers were just beginning to be used for the measurement of membrane processes. We turned naturally to the great treatises on the physics of diffusion and the flow of heat where, to be sure, we could dig out the information that was needed. It was a great joy then to come across this masterful and schol arly discussion on diffusion written for biologists of a physical tum of mind by MERKEL JACOBS. Here were to be found not only the equations that were basic to our knowledge, but also a careful, accurate and logical explanation, both of the physical principles and the mathematical steps. It soon became apparent that we could not keep that one volume of Ergebnisse der Biologie on indefinite loan from the library, and we then found, by good fortune, a remaindered copy of this particular issue. It has become a well-thumbed and treasured possession of the laboratory. Concepts of Biology is designed for the single-semester introduction to biology course for non-science majors, which for many students is their only college-level science course. As such, this course represents an important opportunity for students to develop the necessary knowledge, tools, and skills to make informed decisions as they continue with their lives. Rather than being mired down with facts and vocabulary, the typical non-science major student needs information presented in a way that is easy to read and understand. Even more importantly, the content should be meaningful. Students do much better when they understand why biology is relevant to their everyday lives. For these reasons, Concepts of Biology is grounded on an evolutionary basis and includes exciting features that highlight careers in the biological sciences and everyday applications of the concepts at hand.We also strive to show the interconnectedness of topics within this extremely broad discipline. In order to meet the needs of today's instructors and students, we maintain the overall organization and coverage found in most syllabi for this course. A strength of Concepts of Biology is that instructors can customize the book, adapting it to the approach that works best in their classroom. Concepts of Biology also includes an innovative art program that incorporates critical thinking and clicker questions to help students understand--and apply--key concepts. The Movement of Molecules across Cell Membranes provides an understanding of the molecular basis of the movement of substances across the cell membrane by discussing the composition and structure of cell membranes. Comprised of nine chapters, the book starts by discussing the theory of irreversible thermodynamics to membrane transport, followed by a discussion of the Eyring analysis of diffusion. It then discusses the model for movement into and across the cell membranes. Other chapters focus on the existence of pores in the red cell membranes and the ion movement across the erythrocyte membranes. The book's final chapter considers the four classifications of membrane-based models, which include the mobile carrier model, the pore model, and the two classes of enzyme models. This book is intended for research students, research workers, biochemists, biophysicists, and physiologists. Pharmacologists in the clinical field, as well as research workers in agriculture, will also find this book invaluable.