phospholipid bilayer function pogil

phospholipid bilayer function pogil is a fundamental concept in cell biology that explores how the phospholipid bilayer operates as a crucial component of cellular membranes. This article delves into the structural and functional aspects of the phospholipid bilayer, emphasizing its role in maintaining cellular integrity, facilitating selective permeability, and supporting various cellular processes. The discussion integrates insights related to the phospholipid bilayer function pogil, highlighting how this model helps students and researchers understand membrane dynamics. Key topics include the molecular composition of the bilayer, membrane fluidity, transport mechanisms, and the bilayer's involvement in cell signaling. By examining these elements, the article provides a comprehensive understanding of membrane biology essential for academic and research applications. The following sections outline the main areas of focus for an in-depth exploration of the phospholipid bilayer function pogil.

Structure of the Phospholipid Bilayer

The phospholipid bilayer forms the fundamental framework of cellular membranes, composed primarily of phospholipid molecules arranged in two opposing layers. Each phospholipid consists of a hydrophilic (water-attracting) head and two hydrophobic (water-repelling) fatty acid tails. This amphipathic nature drives the spontaneous formation of a bilayer in aqueous environments, with the hydrophobic tails facing inward and the hydrophilic heads facing outward toward the aqueous surroundings. This arrangement creates a semi-permeable barrier that separates the intracellular environment from the extracellular space.

Molecular Composition

Phospholipids are the primary lipid molecules in the bilayer, but other lipids such as cholesterol and glycolipids are also present. Cholesterol molecules interspersed within the bilayer contribute to membrane stability and fluidity. Proteins embedded in or associated with the bilayer further diversify its functions. These proteins act as transporters, receptors, enzymes, and structural components, collectively supporting the membrane's versatile roles.

Bilayer Organization

The bilayer’s organization is dynamic, allowing lateral movement of individual phospholipids and proteins. This fluid mosaic model describes the membrane as a flexible matrix where components can diffuse laterally, facilitating interactions critical for cellular function. The asymmetric distribution of lipids and proteins between the inner and outer leaflets of the bilayer also contributes to specialized membrane functions.

Membrane Fluidity and Dynamics

Membrane fluidity is a key property influenced by the phospholipid bilayer’s composition and environmental conditions. Fluidity affects membrane permeability, protein mobility, and the ability of the membrane to self-heal after damage. The phospholipid bilayer function pogil addresses these aspects by exploring how factors such as temperature, fatty acid saturation, and cholesterol content modulate membrane dynamics.

Factors Influencing Fluidity

The degree of saturation of fatty acid tails critically impacts fluidity. Unsaturated fatty acids, with one or more double bonds, introduce kinks that prevent tight packing, thereby increasing fluidity. Saturated fatty acids allow closer packing, reducing fluidity. Cholesterol acts as a fluidity buffer, preventing membranes from becoming too rigid in cold temperatures or too fluid in high temperatures.

Implications of Fluidity

Proper membrane fluidity ensures optimal functioning of membrane proteins, supports vesicle formation and fusion, and permits dynamic responses to environmental changes. Cells regulate fluidity to maintain membrane integrity and functionality, a process explored in detail within the phospholipid bilayer function pogil educational framework.

Selective Permeability and Transport Functions

The phospholipid bilayer’s selective permeability is fundamental for cellular homeostasis, controlling the passage of substances into and out of the cell. This selectivity arises from the bilayer’s hydrophobic core, which restricts the free diffusion of polar and charged molecules while allowing small nonpolar molecules to pass.

Passive Transport Mechanisms

Passive transport includes diffusion and facilitated diffusion, processes that do not require energy expenditure. Small nonpolar molecules like oxygen and carbon dioxide diffuse freely through the bilayer, whereas ions and larger polar molecules require specific channel or carrier proteins to cross. Facilitated diffusion relies on these proteins to move substances down their concentration gradients.

Active Transport Mechanisms

Active transport involves the movement of molecules against their concentration gradients, necessitating energy input, typically from ATP hydrolysis. Protein pumps embedded in the phospholipid bilayer, such as the sodium-potassium pump, maintain essential ionic gradients vital for cellular function. The phospholipid bilayer function pogil model highlights these processes to illustrate membrane transport complexities.

Endocytosis and Exocytosis

Beyond passive and active transport, cells use endocytosis and exocytosis to engulf or expel large molecules and particles. These processes depend on the membrane's ability to deform and fuse, characteristics enabled by the flexible phospholipid bilayer. Vesicle formation and trafficking are critical for nutrient uptake, waste removal, and signal transduction.

Role in Cell Signaling and Communication

The phospholipid bilayer is central to cell signaling pathways, serving as a platform for receptor proteins and signaling molecules. Membrane receptors detect extracellular signals such as hormones, neurotransmitters, and growth factors, initiating intracellular responses that regulate cellular activities.

Membrane Receptors and Signal Transduction

Integral membrane proteins act as receptors that bind specific ligands, triggering conformational changes that activate intracellular signaling cascades. These cascades can alter gene expression, enzyme activity, or ion channel states, enabling cells to respond appropriately to environmental cues.

Lipid Rafts and Microdomains

Specialized microdomains within the phospholipid bilayer, called lipid rafts, concentrate signaling molecules and receptors. These lipid-rich regions facilitate efficient signal transduction by organizing membrane components into functional clusters. The phospholipid bilayer function pogil model emphasizes the importance of these domains in cellular communication.

Applications of the Phospholipid Bilayer Function POGIL Model

The phospholipid bilayer function pogil (Process Oriented Guided Inquiry Learning) model is an effective educational approach that enhances understanding of membrane biology through active learning strategies. It engages students in exploring membrane structure and function by guiding them through experiments, data analysis, and critical thinking exercises.

Educational Benefits

The pogil model promotes deeper comprehension by encouraging learners to construct knowledge collaboratively and apply concepts to real-world biological scenarios. It supports mastery of complex topics such as membrane fluidity, transport mechanisms, and signal transduction in a structured, inquiry-based format.

Research and Practical Implications

Beyond education, insights gained from studying the phospholipid bilayer function pogil contribute to biomedical research, drug delivery system design, and synthetic biology. Understanding membrane behavior aids in developing targeted therapies and nanotechnologies that interact with cellular membranes effectively.

1. Phospholipid bilayer composition and organization
2. Regulation of membrane fluidity
3. Mechanisms of selective permeability
4. Membrane roles in signaling pathways
5. Active learning through POGIL methodology

Frequently Asked Questions

What is the primary function of the phospholipid bilayer in a cell membrane?

The primary function of the phospholipid bilayer is to act as a selective barrier that regulates the entry and exit of substances, maintaining the internal environment of the cell.

How does the structure of the phospholipid bilayer contribute to its function?

The bilayer's hydrophilic heads face outward toward the aqueous environment, while hydrophobic tails face inward, creating a semi-permeable membrane that allows selective passage of molecules.

What role do phospholipids play in membrane fluidity?

Phospholipids contribute to membrane fluidity by allowing lateral movement within the layer; their fatty acid composition (saturated vs. unsaturated) affects how rigid or fluid the membrane is.

How does the phospholipid bilayer facilitate cell communication?

The bilayer hosts various proteins and receptors that can transmit signals into the cell, enabling communication and response to external stimuli.

What is the significance of the bilayer’s selective permeability?

Selective permeability allows essential nutrients to enter the cell while keeping harmful substances out, and enables waste products to leave, maintaining cellular homeostasis.

How do embedded proteins interact with the phospholipid bilayer?

Embedded proteins can span the bilayer or attach to its surface, facilitating transport, signal transduction, and structural support within the membrane.

Why is the phospholipid bilayer described as fluid mosaic?

Because it is composed of various molecules like phospholipids, proteins, and cholesterol that move fluidly within the layer, creating a dynamic and mosaic-like structure.

How does the phospholipid bilayer contribute to the formation of vesicles?

The bilayer can curve and pinch off to form vesicles, allowing transport of materials within the cell or secretion outside the cell.

What is the role of cholesterol in the phospholipid bilayer?

Cholesterol molecules interspersed within the bilayer help stabilize membrane fluidity by preventing the fatty acid chains from packing too tightly or becoming too fluid.

How does the phospholipid bilayer enable passive transport?

The bilayer allows small, nonpolar molecules to diffuse through it without energy input, facilitating passive transport across the membrane.

Additional Resources

1. *Phospholipid Bilayers: Structure and Function in Biological Membranes*
This book provides an in-depth exploration of the molecular architecture of phospholipid bilayers and their critical role in cellular membranes. It covers the physical properties of bilayers, membrane dynamics, and interactions with proteins and other biomolecules. Ideal for students and researchers seeking a comprehensive understanding of membrane biophysics.

2. *Membrane Dynamics and Phospholipid Bilayer Function*
Focusing on the fluidity and flexibility of phospholipid bilayers, this text delves into how membrane dynamics influence cellular processes such as signaling, transport, and membrane fusion. It includes experimental techniques and computational models used to study bilayer behavior. The book is well-suited for advanced undergraduates and graduate students in biochemistry and cell biology.

3. *Principles of Cell Membrane Structure: A POGIL Approach*
Designed around the Process Oriented Guided Inquiry Learning (POGIL) methodology, this book encourages active learning about cell membrane components, including phospholipid bilayers. It contains structured activities that build conceptual understanding of membrane permeability, transport mechanisms, and bilayer function. Educators will find this resource valuable for interactive classroom instruction.

4. *Biological Membranes: A Molecular Perspective on Lipid Bilayers*
This book offers a detailed molecular perspective on the composition and function of biological membranes, emphasizing the role of phospholipid bilayers. Topics include lipid diversity, membrane asymmetry, and the impact of bilayer properties on membrane protein function. It integrates biochemical and biophysical approaches to membrane research.

5. *Membrane Biochemistry and Phospholipid Bilayer Function*
Covering fundamental concepts in membrane biochemistry, this book highlights how phospholipid bilayers serve as barriers and platforms for cellular activity. It explores topics such as membrane assembly, lipid-protein interactions, and membrane-associated enzymatic functions. The text is suitable for students in biochemistry, molecular biology, and related fields.

6. *Exploring Membrane Structure and Function Through POGIL Activities*
This resource provides a collection of POGIL activities focused on membrane biology, particularly the structure and function of phospholipid bilayers. It promotes critical thinking and collaborative learning by guiding students through experiments and problem-solving exercises. Teachers can use this book to enhance engagement in courses covering cell membranes.

7. *The Role of Phospholipid Bilayers in Cellular Transport Mechanisms*
This book examines how phospholipid bilayers facilitate and regulate the transport of ions, nutrients, and signaling molecules across membranes. It discusses passive and active transport, vesicular trafficking, and membrane protein functions in detail. The book is a valuable reference for those studying physiology and membrane transport.

8. *Membrane Fluidity and Phospholipid Bilayer Function*
Focusing on the concept of membrane fluidity, this text explores how the physical state of the phospholipid bilayer affects membrane permeability and protein activity. It includes discussions on temperature effects, lipid composition, and cholesterol’s role in membrane stabilization. The book offers insights into how membrane properties influence cellular function.

9. *Cell Membranes: Integrating Structure, Function, and Dynamics*
This comprehensive volume integrates structural biology, biochemistry, and biophysics to provide a holistic view of cell membranes, with a strong emphasis on phospholipid bilayers. It covers membrane assembly, signaling, and interaction with the cytoskeleton, bridging fundamental science and applied research. Suitable for advanced students and professionals in life sciences.

Phospholipid Bilayer Function Pogil

phospholipid bilayer function pogil: Form and Function of Phospholipids Gordon Brian Ansell, John Nigel Hawthorne, Rex Malcolm Chaplin Dawson, 1973

phospholipid bilayer function pogil: *Handbook of Lipid Membranes* Cyrus R. Safinya, Joachim O. Rädler, 2021-09-14 This handbook provides a unique overview of lipid membrane fundamentals and applications. The fascinating world of lipids that harbor and govern so many biological functionalities are discussed within the context of membrane structures, interactions, and shape evolution. Beyond the fundamentals in lipid science, this handbook focuses on how scientists are building bioinspired biomimetic systems for applications in medicine, cosmetics, and nanotechnology. Key Features: Includes experimental and theoretical overviews on the role of lipids, with or without associated biomolecules, as structural components imparting distinct membrane shapes and intermembrane interactions Covers the mechanisms of lipid-membrane curvature, by peptide and protein binding, and the roles of signalling lipids and the cytoskeleton in plasma membrane shape evolution Covers advanced X-ray and force measurement techniques Discusses applications in biomedicine, cosmetics, and nanotechnology, including lipid vectors in nucleic acid, drug delivery in dermal applications, and lipid-based sensors and artificial biointerfaces Covers artificial membranes from block copolymers, synthetic copolypeptides, and recombinant proteins Includes an exciting section that explores the role of lipids in the origin of life in hydrothermal conditions This book is a highly informative companion for professionals in biophysics, biochemistry, physical chemistry, and material and pharmaceutical sciences and bioengineering.

phospholipid bilayer function pogil: Lipid Bilayers J. Katsaras, T. Gutberlet, 2013-06-29 A general review of lipid bilayer structure and dynamics is given, including such current topics as the hydration of lipid bilayers, the superstructural behaviour of bilayers at different states of hydration and external conditions, the role and behaviour of lipid bilayers on fusion and rupture and the interaction of lipid bilayers with small organic molecules and additives and of protein lipid bilayer interactions. In addition, recent research on lipid interaction with proteins and other molecules in monolayers is reviewed, and the use of highly aligned samples under biologically relevant conditions and the benefits derived from such preparations are addressed. Finally, the latest approach in simulation of impurities within a lipid bilayer is introduced. This book will be a comprehensive review of the current state of biologically relevant model membrane systems which will become an indispensible reference for the working biophysicist.

phospholipid bilayer function pogil: Lipid Bilayers M. Ashrafuzzaman, 2019-11-05 The book âLipid Bilayers: Properties, Behavior and Interactions' provides a broad overview of an important biological system âcell membrane'. The cell is the powerhouse where processes of life are controlled. Cell membranes consist of lipid bilayers that make biological boundaries. The bilayer participates in determining most of the cell-based uptakes of materials, exchanging of information between both sides and ensuring helping vital biological processes to continue. We have focused specifically on an understanding of various aspects of lipid membrane bilayers. The book is focused on a detailed description of the diverse mechanisms and phenomena associated with membranes. Lipid bilayers exist in various parts of the cell, namely, across the plasma membrane, mitochondrial membrane, and nuclear membrane. While exploring lipid bilayers we shall, therefore, need to consider structures and functions of various sections of biological cells. Besides spectroscopic observations and electrical measurements of membrane bilayers, we address here the phenomena of coexistence

and independent existence of different membrane components using various theoretical and experimental methodologies popularly used in biology, physics, mathematics, chemistry, biomedical engineering, and general medical sciences. The focus has been made on explaining diverse mechanisms that play crucial roles in molecular level in the construction of lipid bilayers and maintaining the relevant biological functions. This book will be helpful for readers who want to understand biological processes by applying both simple observations and fundamental scientific analysis. It provides a deep understanding of the causes and effects of molecular processes inside lipid bilayer membranes. A group of eminent scientists from around the globe contributed chapters focusing on different aspects. Each chapter may be found to present an individual topic and elaborate on a specific problem. But the chapters altogether have covered most of the basic aspects relevant to the title of the book. The book will be a vital reference for scientific understanding of lipid bilayers.

phospholipid bilayer function pogil: *Planar Lipid Bilayers* W. Hanke, W. R. Schulue, 2012-12-02 Biological Techniques is a series of volumes aimed at introducing to a wide audience the latest advances in methodology. The pitfalls and problems of new techniques are given due consideration, as are those small but vital details not always explicit in the methods sections of journal papers.In recent years, most biological laboratories have been invaded by computers and a wealth of new DNA technology and this will be reflected in many of the titles appearing in the series.The books will be of value to advanced researchers and graduate students seeking to learn and apply new techniques, and will be useful to teachers of advanced undergraduate courses involving practical or project work.Methods of constructing artificial membranes (planar lipid bilayers) from the main components of cell membranes (lipids) date from the early 1960s.Planar bilayers offer direct, quantitative experimental approaches to the study of membranes of precisely determined composition which can be manipulated by the experimenter. Pore-forming molecules, transporter molecules, ATP-dependent enzymes and other entities can be incorporated into the bilayers to simulate biological functions.Reconstitution of such functions in this way remains a key final step in attributing a functional role to purified cell membrane proteins.This book aims to demystify these techniques and begins with a broad overview of the development of the subject before dealing with the protocols involved.Key references are provided at the end of the book together with a list of suppliers.Full practical details include: - How to set up conventional painted and folded bilayer experiments - Patch-dipping methods and use of giant liposomes - Lipid characterization, preparation and purification - Discussion of construction of essential apparatus, flux measurements, electrical recording, data acquisition and computer support - Biochemical methods for use in planar bilayer experiments - Techniques for incorporation of native proteins and other molecules

phospholipid bilayer function pogil: On the Role of the Phospholipid Bilayer Membrane Konrad Kaufmann, 1988

phospholipid bilayer function pogil: *Planar Lipid Bilayers (BLM's) and Their Applications* H.T. Tien †, A. Ottova-Leitmannova, 2003-02-27 The lipid bilayer is the most basic structural element of cell membranes. A wide range of topics are covered in this volume, from the origin of the lipid bilayer concept, to current applications and experimental techniques. Each chapter in this volume is self-contained and describes a group's research, providing detailed methodology and key references useful for researchers. Lipid bilayer research is of great interest to many because of it's interdisciplinary nature.·Provides an overview of decades of research on the lipid bilayer·38 contributed chapters, by leading scientists, cover a wide range of topics in one authoritative volume·Book coincides with 40th anniversary of BLM

phospholipid bilayer function pogil: *Planar Lipid Bilayers* W. Hanke, W.-R. Schlue, 1993 Biological Techniques is a series of volumes aimed at introducing to a wide audience the latest advances in methodology. The pitfalls and problems of new techniques are given due consideration, as are those small but vital details not always explicit in the methods sections of journal papers. In recent years, most biological laboratories have been invaded by computers and a wealth of new DNA

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phospholipid bilayer function pogil: *Lipid Domains* , 2015-06-08 Current Topics in Membranes is targeted toward scientists and researchers in biochemistry and molecular and cellular biology, providing the necessary membrane research to assist them in discovering the current state of a particular field and in learning where that field is heading. This volume offers an up to date presentation of current knowledge in the field of Lipid Domains. - Written by leading experts - Contains original material, both textual and illustrative, that should become a very relevant reference material - The material is presented in a very comprehensive manner - Both researchers in the field and general readers should find relevant and up-to-date information

phospholipid bilayer function pogil: *Solid-supported Phospholipid Bilayers* Arnaldo Joel Diaz Vazquez, 2010 This dissertation focuses on the development of biological platforms on which the function and characterization of transmembrane proteins can be performed simultaneously utilizing a biomembrane mimic consisting of a solid supported phospholipid bilayer (SLB). The study centered on the platform development, biophysical measurements of transmembrane proteins and membrane species chromatography. Membrane proteins play an essential role in various cellular and physiological processes. Their normal functions are essential to our health, and many impaired proteins have been related to serious diseases. Gaining a better understanding of membrane proteins is an essential step towards the development of more specific and competent drugs. This research study is divided into two main parts. The first part centered on the creation of a new platform for allowing transmembrane proteins to freely move inside supported lipid bilayers with the same mobility that can be found in vesicle systems. SLBs have been extensively used as model systems to study cell membrane processes because they maintain the same two-dimensional fluidity of lipids within the membrane found in live cells. However, one of the most significant limitations of this platform is its inability to incorporate mobile transmembrane species. Our strategy involves supporting the lipid bilayer on a double cushion, where we not only create a large space to accommodate the transmembrane portion of the protein, but also passivate the underlying substrate to reduce non-physiological protein-substrate interactions. High diffusion constants and high mobile fractions were obtained for a transmembrane protein reconstituted within this double cushion system. The second area of this study focuses on the creation of a new method to rapidly separate membrane components using electrophoresis in SLBs. This work showed that even subtly different chemical isomers can be well-separated by a simple electrophoretic technique when cholesterol is present in the separation matrix. As a first step towards the purification of proteins, this work showed that streptavidin proteins doubly bound to a bilayer by a biotinylated lipid can be separated from streptavidin proteins which are singly bounded.

phospholipid bilayer function pogil: Advances in Planar Lipid Bilayers and Liposomes A.

Leitmannova Liu, 2011-08-09 Advances in Planar Lipid Bilayers and Liposomes, Volume 7, continues to include invited chapters on a broad range of topics, covering both main arrangements of the reconstituted system, namely planar lipid bilayers and spherical liposomes. The invited authors present the latest results in this exciting multidisciplinary field of their own research group.Many of the contributors working in both fields over many decades were in close collaboration with the late Prof. H. Ti Tien, the founding editor of this book series. There are also chapters written by some of the younger generation of scientists included in this series. This volume keeps in mind the broader goal with both systems, planar lipid bilayers and spherical liposomes, which is the further development of this interdisciplinary field worldwide. - Contributions from newcomers and established and experienced researchers - Exploring theoretically and experimentally the planar lipid bilayer systems and spherical liposomes - Indispensable source of information for new scientists

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phospholipid bilayer function pogil: Function and Metabolism of Phospholipids in the Central and Peripheral Nervous Systems Giuseppe Porcellati, 2013-03-09 The present volume contains all the contributions and general discussion presented at the International Satellite Meeting on Func tion and Metabolism of Phospholipids in Central and Peripheral Nervous Systems held at Cortona, Tuscany, Italy in August 1975. The Satellite Meeting was organized on the frame of the 5th Inter national Congress of the International Society for Neurochemistry (Barcelona, 2-7 september 1975) and was just run before it. The publication of the scientific content of this volume has been made possible by the collaboration of the speakers, the discussants, the Meeting Chairman, the section chairmen and of all the scientists who have taken part at the Symposium and who deeply and actively discussed the lectures and the contributions to the General Discus sion which were delivered. In order to obtain rapid publication of the volume, however, the single discussions for each delivered contribution will not be reported here. The general subject of membrane structure, of the turnover of its lipid components in CNS and PNS, their functional implica tions and pharmacological actions, was explored in details from the stand-points of the various contributors in biophysics, biochem istry, physiology, cytology, pharmacology and pathology. The whole Symposium was effiCiently introduced and closed by Dr. W. Stoffel. The meeting has been thought to have been very successful.

phospholipid bilayer function pogil: *Phospholipid Signaling Protocols* Ian Bird, 2013-08-23 Cell membranes are not, as once believed, inert structures designed to contain the cell contents, but

are in fact dynamic structures that are as me- bolically active as the cytosol and other cellular compartments they surround. Thus membranes not only contain mixtures of lipid and phospholipids, but also many proteins both embedded deeply within the membrane structure itself and also more loosely attached on the membrane surfaces. Though many such proteins have long been known to act as transport proteins, ion channels, hormone receptors, G proteins, cytoskeletal anchorage points, and so on, the major advance of recent years is the increasing understanding that the lipids and phospholipids in the membrane bilayer itself are also metabolized to b- logically active products that can diffuse either in the cytosol or in the m- brane bilayer to control the function of other proteins. Thus the concept of lipid-derived second messengers is now firmly established.

phospholipid bilayer function pogil: Phospholipids Handbook Gregor Cevc, 1993-08-02 Employing a multidisciplinary approach to phospholipid research, this work catalogues the current knowledge of this class of molecules and details the general, chemical, physical and structural properties of phospholipid monolayers and bilayers. Phospholipid applications are also covered.

phospholipid bilayer function pogil: Acidic Phospholipids in the Structure and Function of Lipid Membranes Kari K. Eklund, 1990

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phospholipid bilayer function pogil: The Effect of Acyl Chain Unsaturation on Phospholipid Bilayer Smita Pravin Soni, 2010 Each biological cell is surrounded by a membrane that consists of many different kinds of lipids. The lipids are mainly composed of phospholipids, which form a fluid bilayer that serves as the platform for the function of membrane bound proteins regulating cellular activity. In the research described in this thesis we employed solid state 2H NMR, complemented by DSC (differential scanning calorimetry) and MD (molecular dynamics) simulations, to study the effect of PUFA (polyunsaturated fatty acids) and TFA (trans fatty acids) on molecular organization in protein-free model membranes of controlled composition. These two classes of unsaturated fatty acid incorporate into membrane lipids and have, respectively, a beneficial and harmful impact on health. The aim is to gain insight into the molecular origin of this behavior. DHA (docosahexaenoic acid), which with 6 natural cis double bonds is the most highly unsaturated PUFA found in fish oils, and EA (elaidic acid), which with only a single unnatural trans double bond is the simplest manmade TFA often found in commercially produced food, were the focus. 2H NMR spectra for [2H31]-N-palmitoylsphingomyelin ([2H31]16:0SM) in SM/16:0-22:6PE (1-palmitoyl-2-docosahexaenoylphosphatidylethanolamine)/cholesterol (1:1:1 mol) mixed membranes were recorded. This system served as our PUFA-containing model. The spectra are consistent with lateral separation into nano-sized (20 nm) domains that are SM-rich/cholesterol-rich (raft), characterized by higher chain order, and DHA-rich/cholesterol-poor (non-raft), characterized by lower chain order. The aversion cholesterol has for DHA, as opposed to the affinity cholesterol has for predominantly saturated SM, excludes the sterol from DHA-containing PE-rich domains and DHA from SM-rich/cholesterol-rich domains. It is the formation of highly disordered membrane domains that we hypothesize is responsible, in part, for the diverse health benefits associated with dietary consumption of DHA. 2H NMR spectra for 1-elaidoyl-2-[2H35]stearoylphosphatidylcholine (t18:1-[2H35]18:0PC) and 1-oleoyl-2-[2H35]stearoylphosphatidylcholine (c18:1-[2H35]18:0PC) were recorded to compare membranes with respect to a trans vs. cis (natural) double bond. The spectra indicate that while a trans double bond produces a smaller deviation from linear conformation than a cis double bond, membrane order is decreased by a comparable amount because the energy barrier to rotation about the C-C single bonds either side of a italictrans/italic or italiccis/italic double bond is reduced. Although EA adopts a conformation somewhat resembling a saturated fatty acid, the TFA

is almost as disordered as its italiccis

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