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Commentary

An Overview of Structure and Function of Biological Membranes

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DESCRIPTION

A Biological Membrane (BM), bio-membrane, or Cell Membrane (CM) is a semipermeable membrane that provides as a boundary between one part of the cell and another in order to separate the inside of a cell from the external environment or to create intracellular components. Biological Membrane (BM), in the form of eukaryotic cell membranes, are constructed of a phospholipid bilayer with embedded, comprehensive, and peripheral proteins that are used in chemical and ion transport and communication.

The majority of lipid in a cell membrane provides as a fluid matrix for proteins to rotate and diffuse symmetrically for biological mechanisms. The concentration of an annular lipid enclosure, consisting of lipid molecules strongly connected to the surface of integral membrane proteins, evolves enzymes to the high membrane permeability environment of a lipid bilayer. Cell Membranes (CM) differ from isolating organs formed by cell layers, such as mucous membranes, basement membranes, and extremely significant membranes.

STRUCTURE AND COMPONENTS OF THE CELL MEMBRANE

Membrane lipids

Bilayer membrane lipids have both hydrophobic and hydrophilic ends. They represent approximately half of the surface area of most cell membranes. The lipid composition varies depending on the type of cell membrane. For example, the plasma membrane is made up of approximately 50% lipid and 50% protein. The mitochondrial inner membrane is 25% lipid and 75% protein.

Membrane proteins

Membrane proteins are a dynamic and essential component of the cell membrane. They contain at least half of the total surface area of most membranes. Their presence in the membrane is required for signaling, communication, and a wide range of many other biological functions in organisms.

Membrane carbohydrates

Carbohydrates are the plasma membrane's third major component. They associate to the membrane's outer surface while being associated to proteins (forming glycoproteins) or lipids (forming glycolipid). They can also be identified as polymer structure in an integral membrane, which are known as proteoglycans. These carbohydrates, which are made up of 2-60 monosaccharide units (which can be straight or branched), coat the surface of all eukaryotic cells.

Properties of the lipid bilayer

Electron microscopy, x-ray diffraction, and freeze-fracture electron microscopy can all be used to examine the lipid bilayer structure. The techniques helped in the creation of detailed information about the membrane's organization and the properties attributed to lipid molecules. Asymmetry, fluidity, and the formation of lipid membranes are examples of cell membrane properties.

FUNCTIONS OF BIOLOGICAL MEMBRANES

The variance of the plasma membrane helps in the differentiation of living from organic material. When animal cells are subjected programmable cell death, or cell proliferation, phosphatidylserine, which is usually subjected to the cytosolic side of the plasma membrane lipid bilayer, rapidly catalyses the transfer to the extracellular membrane surface. The presence of phosphatidylserine on the cell surface signals surrounding cells, such as immune cells, to phagocytose and absorb nutrients the dead cell. The biological membrane plays an important role in the transport of molecules by membrane proteins. Membrane proteins are also classified into channel proteins and carrier proteins based on their functions.

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Biological membranes are the separations of cells that protect humans from the outside world while also performing important functions for living organisms. The properties of cell membranes are decided to share for both prokaryotic and eukaryotic organisms. The membrane's bilayer is made up of three major biomolecules: Lipids, proteins, and carbohydrates. Furthermore, developments in biophysical techniques and the availability of substantial amounts of computing capabilities are expanding our awareness of lipid bilayers and providing critical insights into their structures and functions.