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Opinion

A Brief Discussion about Plasma Membrane

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DESCRIPTION

A cell's plasma membrane is a network of lipids and proteins that serves as a barrier between the contents of the cell and outside of the cell. It's also known as the cell membrane. The plasma membrane's primary role is to protect the cell from its surroundings. It is semi-permeable and controls the flow of materials in and out of the cell. Plasma membranes are found in all living thing's cells.

In nature, it is semipermeable. Only after understanding the chemical composition and the invention of the electron microscope in the 1950's did a major advance in understanding the exact structure of cell membrane become possible. Carbohydrates are also found in little amounts. 'The Fluid Mosaic Model,' introduced by Seymour Jonathan Singer and Garth L. Nicolson, is a generally accepted model for the organisation of plasma membrane . According to the model, the plasma membrane is a lipid bilayer that surrounds the cell and contains a mosaic of globular proteins. Many cells have different lipid and protein compositions; for example, the human erythrocyte membrane has roughly 52% protein and 40% lipids. The cell boundary is made in a quasi-fluid (partly liquid and partly solid) condition by the lipid bilayer, which is dynamic in nature. Lipids and proteins are able to freely diffuse across the membrane due to its fluid nature. Phospholipids (the major membrane lipid) have a hydrophilic head on the outside and a lengthy hydrophobic tail on the inside of the lipid bilayer. Peripheral and integral membrane proteins have been recognised as two categories of proteins in the plasma membrane, based on their location and interaction. Peripheral membrane proteins, which are superficially linked to the lipid bilayer, are primarily engaged in cell signaling. Integral membrane proteins are partially or fully buried in the plasma membrane. Transmembrane proteins are the most abundant type of integral membrane protein. Structurally, prokaryotic cell membrane is similar to that of eukaryotes.

The mesosome is a particular membranous structure created by the extension of the plasma membrane in the cell. It comes in the form of vesicles, tubules, and lamellae. The surface area of the plasma membrane is increased by mesosomes. Cell division, cell proliferation, communication at intercellular junctions, cell secretion and endocytosis all benefit from the quasi-fluid state of membranes. The selective permeability of the plasma membrane restricts molecular mobility and maintains cell composition. Some molecules move across the membrane passively, without expending any energy, following a concentration gradient, a process known as passive transport. Diffusion and osmosis are two processes that allow molecules to travel passively. A few charged (for example, ions and amino acids) or uncharged (for example, glucose) molecules, on the other hand, cannot pass the plasma membrane by simple diffusion. Movement of such molecules is facilitated by carrier proteins for example, glucose transporter and channel proteins. Such molecular movement is known as the facilitated movement. Aquaporins are one of the most important channel proteins for water transport across the plasma membrane in plant and animal cells. Ion channels are well-studied channel proteins found in the membranes of muscle and nerve cells. Transporting molecules against a concentration (i.e., from lower concentration to higher concentration) gradient requires the use of energy from ATP molecules.

CONCLUSION

Membranes are lipid and protein-based barriers that serve a range of functions in cells and intracellular organelles. Membranes separate the inside from the outside, allowing only particular molecules to pass through and relaying messages via a chain of molecular reactions.

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