

Cell Membrane Structure

The cell membrane is primarily composed of a mix of proteins and lipids. Depending on the membrane's location and role in the body, lipids can make up anywhere from 20 to 80 percent of the membrane, with the remainder being proteins. While lipids help to give membranes their flexibility, proteins monitor and maintain the cell's chemical climate and assist in the transfer of molecules across the membrane.

Lipids

Phospholipids are a major component of cell membranes. Phospholipids form a lipid bilayer in which their hydrophilic (attracted to water) head areas spontaneously arrange to face the aqueous cytosol and the extracellular fluid, while their hydrophobic (repelled by water) tail areas face away from the cytosol and extracellular fluid. The lipid bilayer is semi-permeable, allowing only certain molecules to diffuse across the membrane.

Cholesterols

Cholesterol is another component of animal cell membranes. Cholesterol molecules are selectively dispersed between membrane phospholipids. This helps to keep cell membranes from becoming stiff by preventing phospholipids from being too closely packed together. Cholesterol is not found in the membranes of plant cells.

Carbohydrates

Other lipids, called glycolipids, are located on cell membrane surfaces and have a carbohydrate sugar chain attached to them. These help the cell to recognize other cells of the body.

Proteins

The cell membrane contains two types of associated proteins. Peripheral membrane proteins are exterior to and connected to the membrane by interactions with other proteins. Integral membrane proteins are inserted into the membrane and most pass through the membrane. Portions of these transmembrane proteins are exposed on both sides of the membrane. Cell membrane proteins have a number of different functions.

- Structural proteins help to give the cell support and shape.
- Receptor proteins help cells communicate with their external environment through the use of hormones, neurotransmitters, and other signaling molecules.
- Transport proteins move molecules across cell membranes through facilitated diffusion.
- Glycoproteins have a carbohydrate chain attached to them. They are embedded in the cell membrane and help in cell to cell communications and molecule transport across the membrane.