

Plasma Membrane and Transport

I. Cell Membrane (Plasma Membrane)- regulates what enters and leaves the cell, provides protection and support, and allows for intercellular communication. IT IS A FLUID STRUCTURE!!

A. Phospholipid bilayer- Made up of lipids, proteins, and carbohydrate chains.

Considered “mosaic”- lots of different types of molecules that assemble to form a function.

1. There are two layers of lipids that make up the bilayer. Each individual lipid has two sections:
 - a. Cholesterol is also found in between the phospholipids- it acts to make the bilayer stronger and more flexible.
 - b. The bilayer is semipermeable- it allows certain molecules to pass through the membrane.
2. There are many different proteins. Proteins help in cell-to-cell communication, mark certain types of cells, and allow entry/exit of materials.
3. Carbohydrate chains are attached to proteins found on the outside layer of the cell membrane. Carbohydrates act as chemical identifiers, that allow one cell to identify another

II. Transport

A. Diffusion- solute particles move from an area of high concentration to an area of low concentration. (With a concentration gradient)

1. Substances can diffuse across the cell membrane without requiring any energy.
2. Equilibrium is when there is an equal concentration of solute throughout the system.

B. Osmosis- is the diffusion of **water** across a selectively permeable membrane. Water moves across membranes until equilibrium is reached. (With a concentration gradient)

1. Isotonic- concentration of solutes is the same inside and outside the cell
2. Hypertonic- concentration of solute is higher outside the cell
3. Hypotonic- concentration of solute is higher inside the cell

C. Facilitated Diffusion- very large or charged molecules cannot pass directly through the cell membrane instead a cell membrane protein (integral protein) helps, or facilitates, the movement across the membrane. (Moves with a concentration gradient)

1. Hundreds of different proteins allow a particular substance to cross membranes. It is very fast and specific!
2. No energy is required (Passive Transport)

D. Active Transport- solutes move against the concentration gradient, which requires ATP or energy.

1. Active transport of small molecules and ions is carried out by proteins called pumps, which are found in the cell membrane.