Chapter 7

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- Phospholipids have hydrophilic heads and hydrophobic "tails."
    1. Useful because inside and outside of cell is made of water.
- Carbohydrates on surface of cell membrane define what type of cell it is and let other cells identify it.
- Non-polar tails face each other, while polar heads point out (into and outside of cell).
- Molecules that are impermeable to the cell membrane are large and have charge.
- Small, non-polar molecules are able to pass through the membrane without difficulty.
- Proteins, depending on their structures, can have hydrophobic and philic amino acids, which makes them useful for transport.
    1. Inside of the membrane are nonpolar amino acid-based proteins which are hydrophobic and anchor the protein into the membrane.
    2. Polar amino acid-based proteins appear on the outer surfaces of the membrane and permeate into the fluid inside or outside the cell. These proteins are hydrophilic and extend into the extracellular fluid and cytosol.
- Integral (trans-membrane protein) spans the whole membrane and are often channel proteins.
- Glyco -lipids and -proteins stick out from the cell and aid cell communication.
- Cholesterol affects the membrane fluidity. The more cholesterol, the more fluid the cell membrane.
- Carbohydrates are non-polar, and, thus, they must be attached to a protein or lipid, or else they would be rejected by the polar head of the lipid bilayer.
- Passive transport has two types of diffusion, both of which do not require energy, as molecules move across their concentration gradient:

    1. Simple Diffusion − Molecules simply move across the membrane
    2. Facilitated Diffusion − Channel proteins move molecules through their channels into or out of the cell.

- Active Transport − This involves ATP, as a channel protein uses a protein pump to move molecules away from their concentration gradient.
- Large molecules move through exo- or endo- cytosis.
    1. Exocyotosis − Forms a vacuole or vesicle to move particles out of the cell.
    2. Endocytosis − Forms a vacuole or vesicle to move particles into the cell.
- Direction of osmosis is determined by comparing total solute concentrations.
    1. Hypertonic − More solute, less water.
    2. Hypotonic − Less solute, more water.
    3. Isotonic − Equal solute, equal water.
- Cell survival depends on balancing water uptake and loss:
    1. In a hypotonic solution, an animal cell becomes lysed (burst), whereas a plant cell stands due to its turgid pressure directed outwards.
    2. In an isotonic solution, animal cells are normal, while plant cells become flaccid.
    3. In a hypertonic solution, animal cells shrivel and die, while plant cells become plasmolyzed.