**CELL BOUNDARIES**

Cell membrane – thin, flexible barrier

Cell wall – a strong supportive layer

**Cell Membrane**

1. *Function*
   1. Regulates what enters and leaves the cell, provides protection and support.
2. *Composition*
   1. lipid bilayer – 2 layers of lipid molecules which makes the membrane a flexible, but strong barrier.
   2. Proteins
      1. Forms channels
      2. “pumps” materials through the membrane
   3. Carbohydrates (many different types)
      1. Identification of the cell

**Cell Wall**

* present in plants, algae, fungi, and many prokaryotes
* outside the cell membrane
* have pores large enough to allow water, oxygen, carbon dioxide, and other molecules to pass through easily

1. *Function*
   * Support
   * Protection
2. *Composition*
   * Carbohydrate and protein fibers
   * They are formed within the cell, then released at the surface of the cell membrane and assembled to form the cell wall
   * Plant cell walls are made mostly of cellulose (like the paper you are writing on is made of)

**DIFFUSION THROUGH CELL BOUNDARIES**

\*\*\*\*\*\*ALL LIVING CELLS NEED LIQUID TO SURVIVE\*\*\*\*\*

The cell membrane regulates movement of dissolved molecules on one side of the membrane to the liquid on the other side.

A **solution** is a mixture of 2 or more substances. Those substances that are dissolved are called **solutes.**

**Concentration = mass of solute**

**Volume of solution**

Example: If you have 12g of salt dissolved in 3 liters of water

You have 12g/3L or 4g/L

**Diffusion** – movement of molecules from a high concentration to low concentration to reach an equilibrium.

**Permeability of cells** (whether or not the cells allow molecules to flow through)

**Impermeable**– a molecule **CAN** **NOT** flow through.

**Permeable** – a molecule **CAN** go through

**Selectively permeable** (most biological membranes) – allow some molecules to flow through, while others can’t

**Osmosis** – is the diffusion of WATER through a selectively permeable membrane.

HOW OSMOSIS WORKS

Water moves across the membrane until an equilibrium is reached.

**Isotonic solution** – “same strength”

**Hypertonic solution**- “above strength” (higher concentration of solute)

**Hypotonic solution** – “under strength” (lower concentration of solute)

How can a larger molecule diffuse across the cell membrane if there are not “holes” large enough for it to pass through?

**Facilitated diffusion** – proteins embedded in the membrane have channels in which these molecules are pumped through; therefore are facilitated in the diffusion process; but does not require the cell’s energy.

**Active Transport** – requires energy from the cell to move molecules across the cell membrane