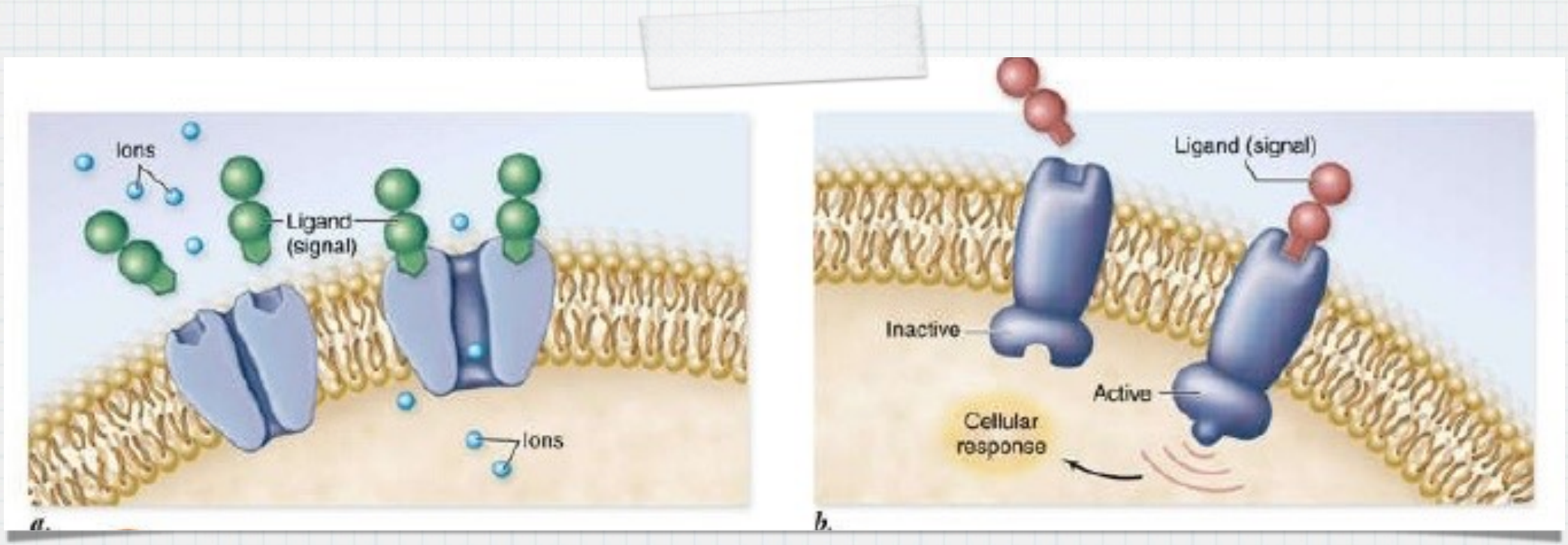
Cell Transport

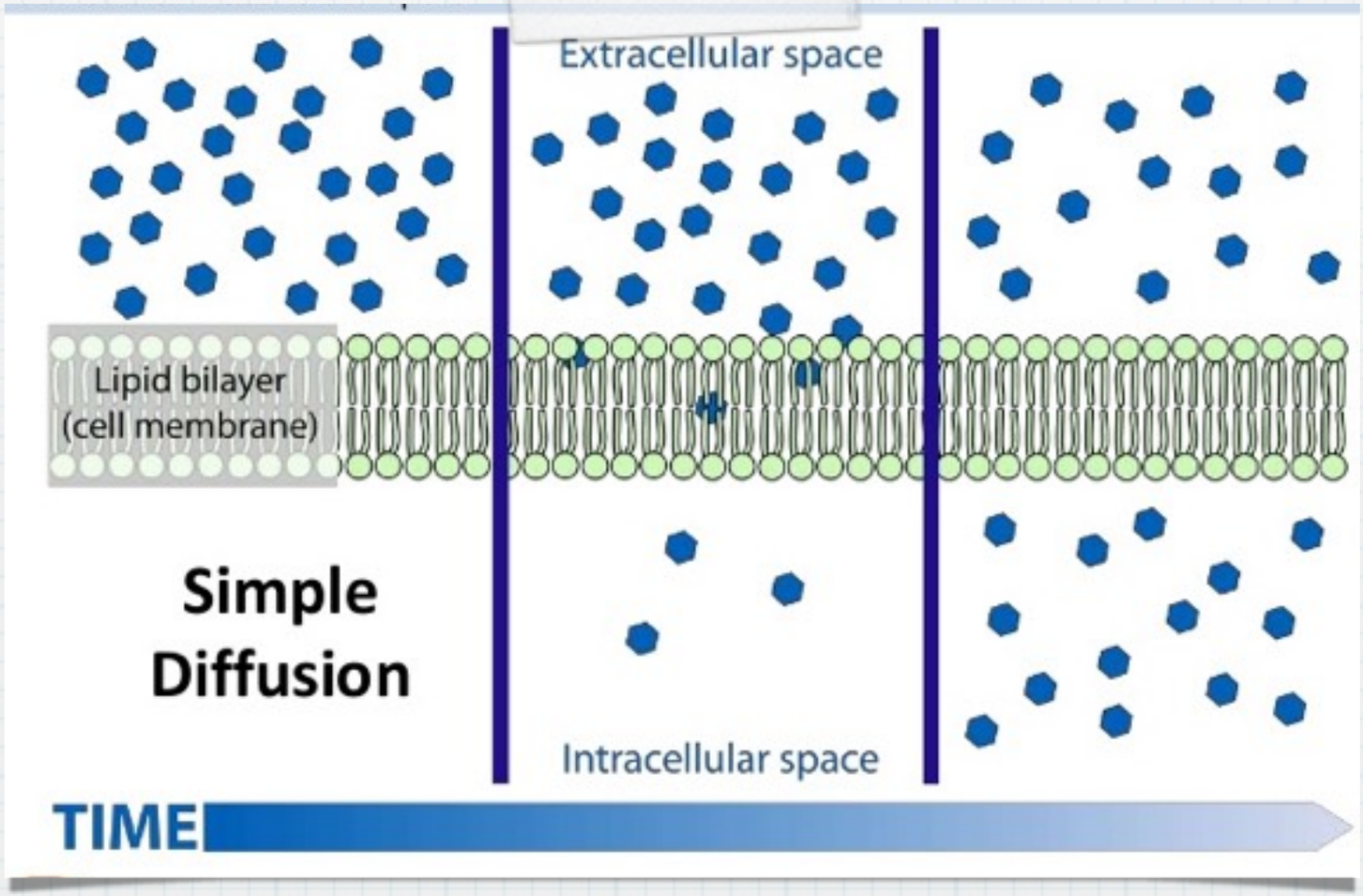
Osmosis and Diffusion

* Cells have to communicate with the external environment to get nutrients and chemicals into and out of the cell.



Simple Diffusion

* the random movement of molecules from [high] to an area of [low] (ie., down a concentration gradient) until equilibrium is reached.



* Simple diffusion depends upon:
    * 1. Temperature
    * 2. Molecule Size
    * 3. Concentration gradient
    * 4. Nature of solute and solvent
    * 5. Solubility
    * 6. Distance traveled

* once the concentrations are equal, the particles do NOT stop moving

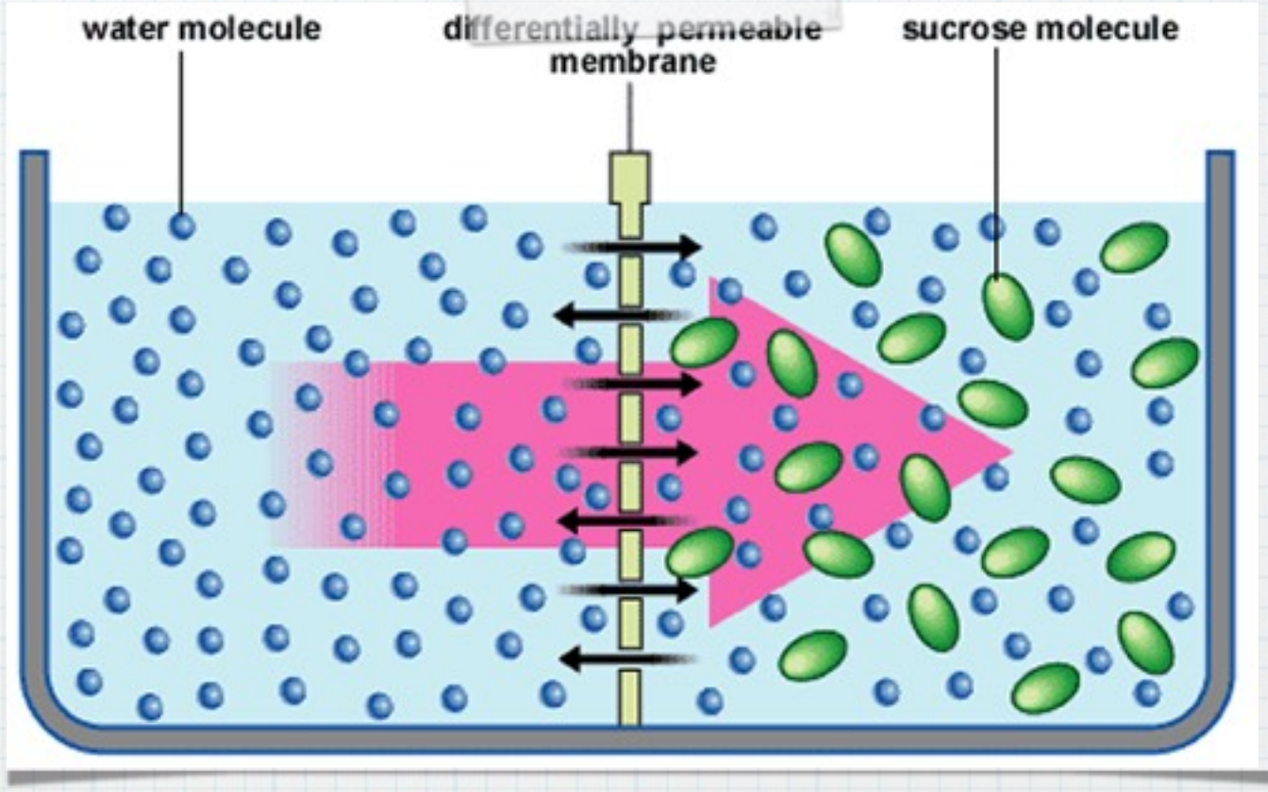
* they move so that the concentration of the both areas remains the same = Dynamic Equilibrium

* an excess amount of molecules on either side of the membrane would destroy the cell

Osmosis

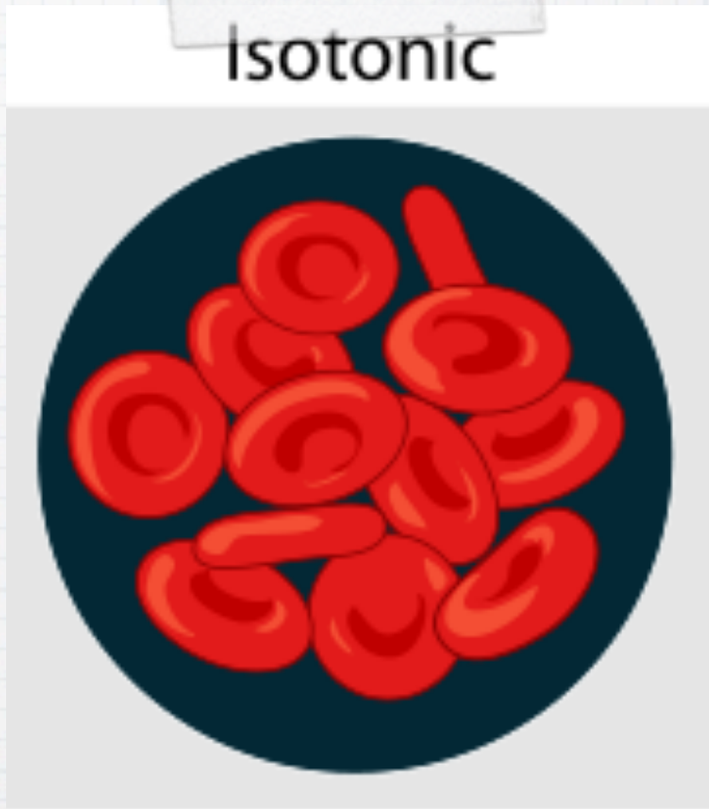
* the simple diffusion of WATER across a semi-permeable membrane - again down a concentration gradient.

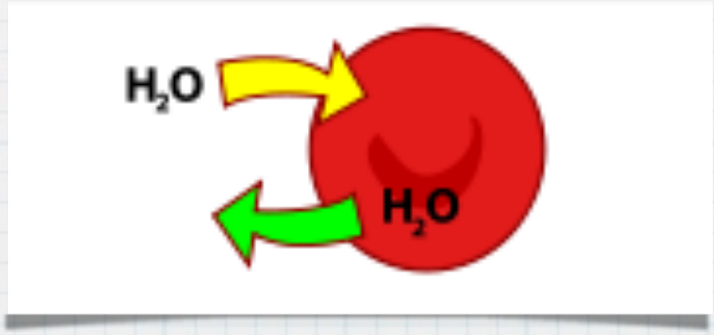
* depends upon pore size



Osmotic States

* 1) Iso-osmotic (Isotonic) Solution
* water moves freely in both directions
* no change in cell size





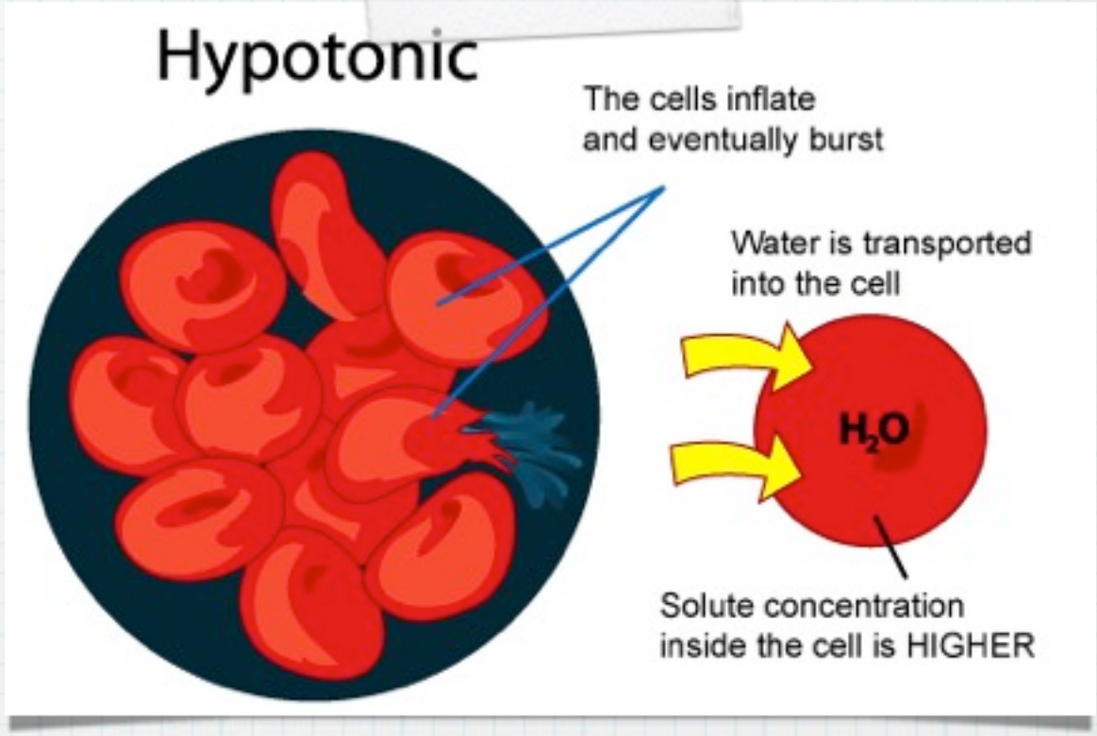
Osmotic States

* 2. Hypo-osmotic (hypotonic) solution

* the [water] inside the cell is less than [water] outside of the cell.

* water will move from out to in

* cell will swell, increase in turgor and may eventually burst



Osmotic States

* 3) Hyper-osmotic (hypertonic) Solution

* hypertonic if [water] inside the cell is greater than the [water] outside of the cell.

* water moves from in to out of the cell

* cell shrinks