

Osmosis

- *The passive transport of water molecules through a semipermeable membrane*
 - A *partially/semi/selective permeable membrane* is one that allows certain substances to pass through
- Water moves as a result of a difference between solute concentrations on either side of a semi-permeable membrane
 - *Solute*: substances dissolved in, for example, water
- If a solution on one side has a high concentration of solutes, it is called *hypertonic* or *hyperosmotic*
 - Water will move towards it
- If a solution has a low concentration of solutes, then it is called *hypotonic* or *hypo-osmotic*
 - Water will move away from it
- If both sides are of equal concentrations, the solution is *isotonic*
 - Water will stop moving, as the concentrations in both sides have reached an *equilibrium*

Facilitated diffusion

- Possible due to some proteins
- Even though the proteins change shape in order to transport the substance, it doesn't require energy
- Specific substances can pass through specific proteins
- Molecules move until the concentrations are the same on both sides. Then the protein closes

Active transport

- Some membrane proteins move molecules from an area with low concentration to an area with high concentration
 - Against the concentration gradient
- Example: the sodium (Na⁺) – potassium (K⁺) pump in nerve cells
 1. A specific protein binds to 3 intracellular Na⁺
 2. The binding causes phosphorylation. ADP is created
 - ATP – 1 phosphate = ADP => *phosphorylation*
 3. The phosphorylation causes the protein to change shape expelling Na⁺ to the exterior. ADP is released leaving a phosphate group attached
 4. Two extracellular K⁺ bind to different regions of the protein