

# Cell Transport

## What is Cell Transport?

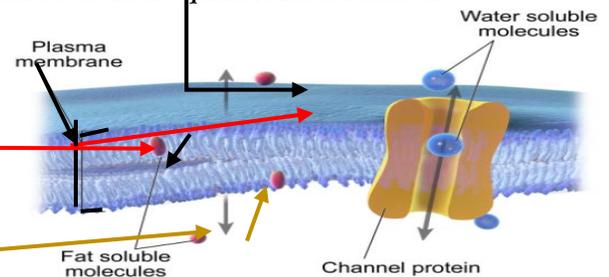
Cell Transport refers to the movement of substances across the cell membrane either into our cells or out of the cell. We refer to "stuff inside the cell" as **Intracellular** & "stuff that is outside of the cell" as **extracellular**. Some "things" can move into or out of the cell by just passing through the phospholipid bilayer of the cell membrane no problem, as if they were ghost passing through a wall. Other things cannot do this and need the assistance of a protein to cross the cell membrane, kinda like we need a door to pass through a wall.

## What do you need to know?

- ✓ You need be able to describe intra and extracellular environments as being hyp/hyper/iso – tonic.
- ✓ PASSIVE forms of transport do NOT require energy such as **diffusion, facilitated diffusion** and **osmosis**.
- ✓ Understand the ACTIVE forms of transport the DO REQUIRE ENERGY such as protein pumps and endo/exo-cytosis

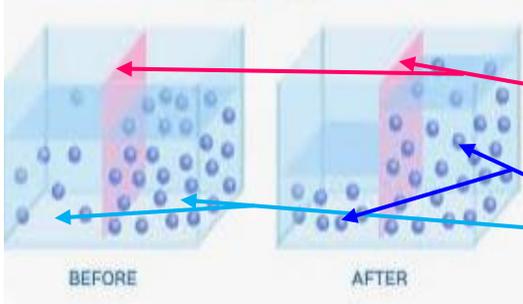
**PASSIVE TRANSPORT:** Stuff moves from High Concentration to Low Concentration until equilibrium is reached.

- The **cell membrane (aka plasma membrane)** is semipermeable, which means some things can permeate (aka penetrate through) and some things can NOT.
- Only the **smallest of things** can passively diffuse through the semipermeable membrane such as carbon dioxide (CO<sub>2</sub>), water (H<sub>2</sub>O) and oxygen (O<sub>2</sub>).
- Depending on if they are fat soluble or water soluble determines if they need a **channel protein** to diffuse through vs diffusing straight through the membrane.



**Diffusion Across the Plasma Membrane**

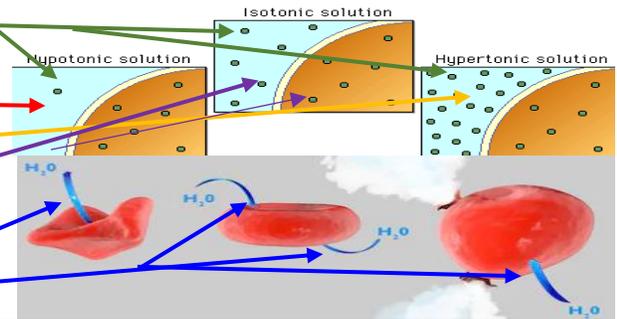
## OSMOSIS



- ❖ Osmosis is basically the same thing as diffusion, except focusing specifically on the movement of water, where diffusion focuses on the movement of solutes (things that are not water)
- ❖ In the "before" section, there is = amounts of H<sub>2</sub>O, but there is a higher concentration of solutes on the right.
- ❖ The water moves through the **membrane** to equal out the concentrations.
- ❖ Concentration = the ratio "comparison" of how much water there is to how much solute (**blue sphere things**) there is.
- ❖ There should be equal amounts of solutes (**spheres**) to **water** on both sides to reach equilibrium.

## How to describe a solution in comparison to the cell

- Solutions that have lower solute concentrations (aka: **dissolved things**) in comparison to inside the cell are described as **HYPOTonic**.
- Solutions that have more solutes than there are inside the cell are described as **HYPERTonic**.
- Solutions that have equal concentrations of solutes as the inside of the cell are described as **ISOtonic**.
- **THERE IS ALWAYS WATER MOVEMENT!!!**



## ACTIVE TRANSPORT REQUIRES ENERGY

- ✚ The cell membrane is involved in cytos.
  - It can capture extracellular substance and bring it into the cell: **ENDOcytosis**
  - It can "absorb/merge" with vesicles to dispatch intracellular stuff: **EXOcytosis**
- ✚ Cells also use protein "**pumps**" to pump out or pump in substances regardless of concentration
- ✚ Active transport goes against the concentration gradient (high to low), meaning active transport moves substances from **low concentration to high concentration, THIS REQUIRES ENERGY**

