

CELLULAR TRANSPORT

AIM: Explain the role of cell membranes as a highly selective barrier (diffusion, osmosis, facilitated diffusion, active transport).



ACTIVATOR:

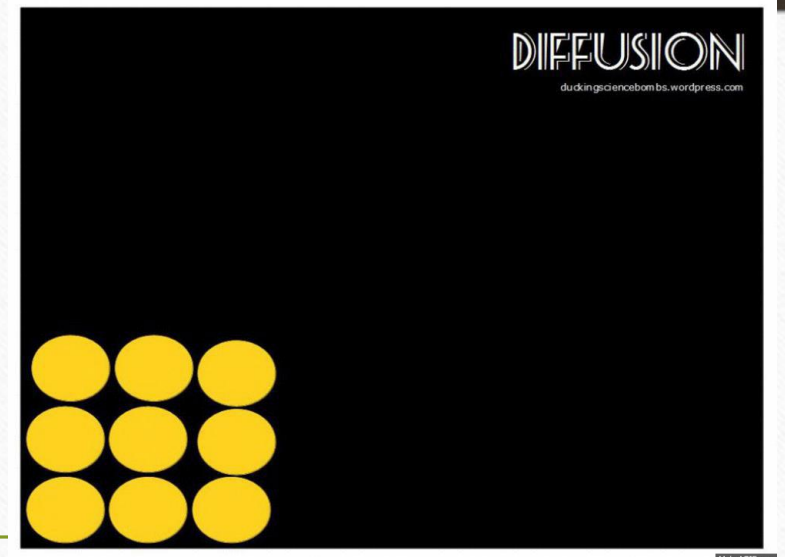
- Imagine you are in your living room watching TV and your mom starts to bake cookies in the kitchen on the other side of your house.
- Did you know exactly when she started?
- How did you know she was baking cooking?
- WE CAN ANSWER THE 11st question because of diffusion

WHAT ABOUT THIS

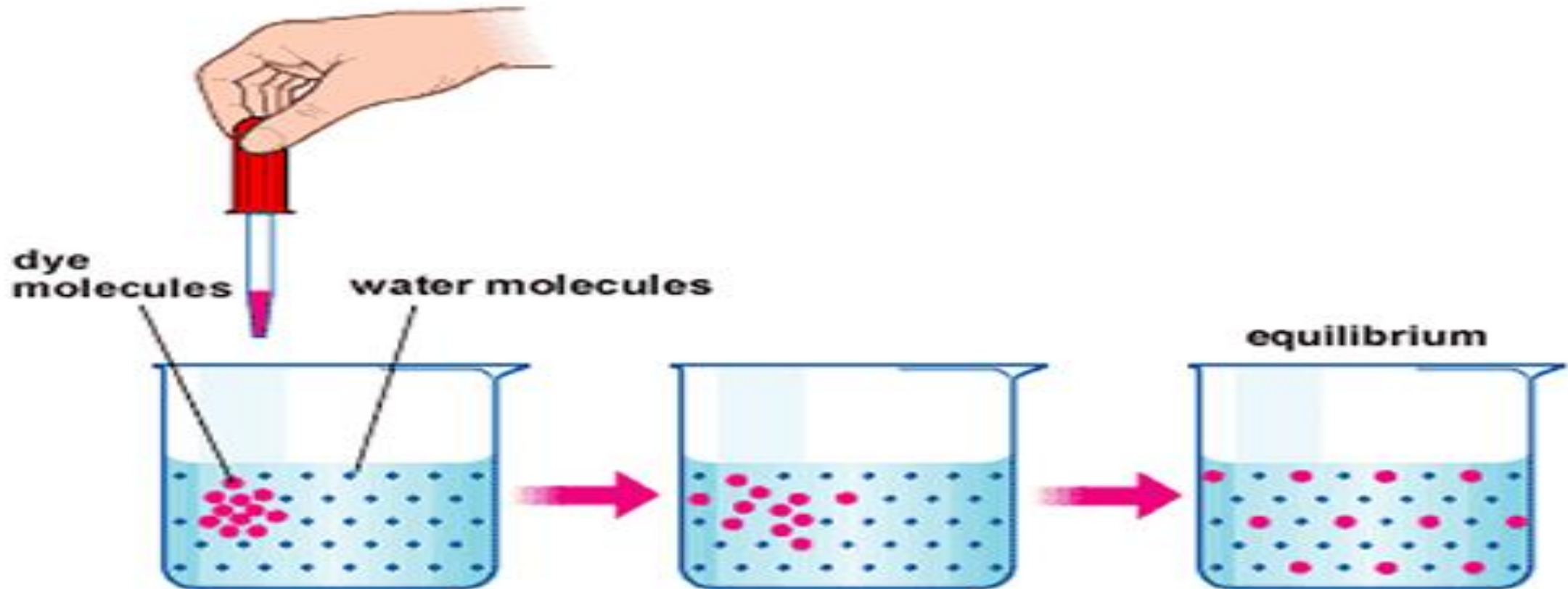


Diffusion

- **Diffusion** is the movement of particles of a substance from an area where there is many particles to an area where there are much fewer particles.

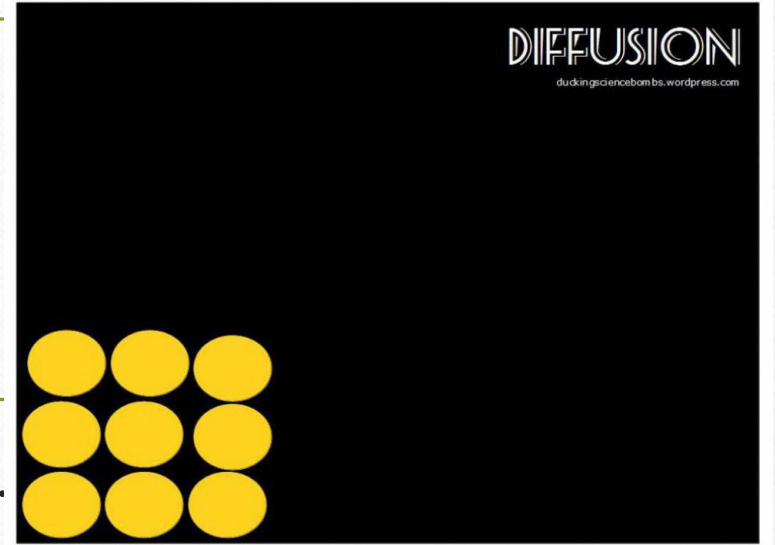


CAN YOU EXPLAIN WHAT IS GOING ON IN THIS PICTURE?????



HOW DIFFUSION WORKS

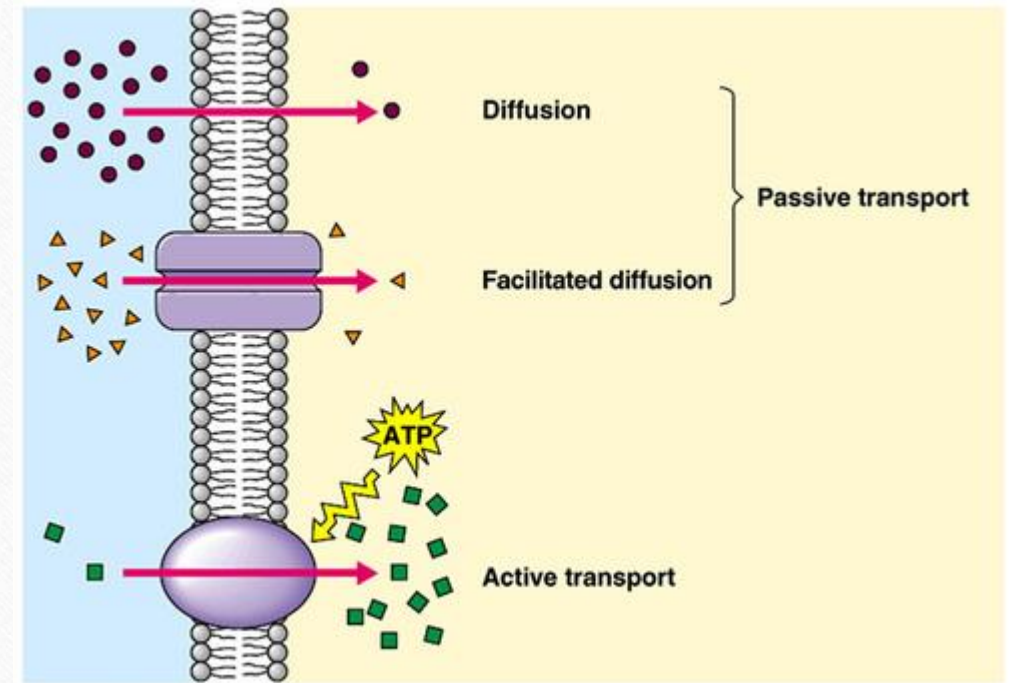
There are some main factors that help Diffusion work....



- **Concentration: # of particles ,
More Particles means faster rate of diffusion**
- **Temperature & Pressure- if we raise the temperature & pressure the rate also increases.**

Diffusion across a plasma(cell) membrane

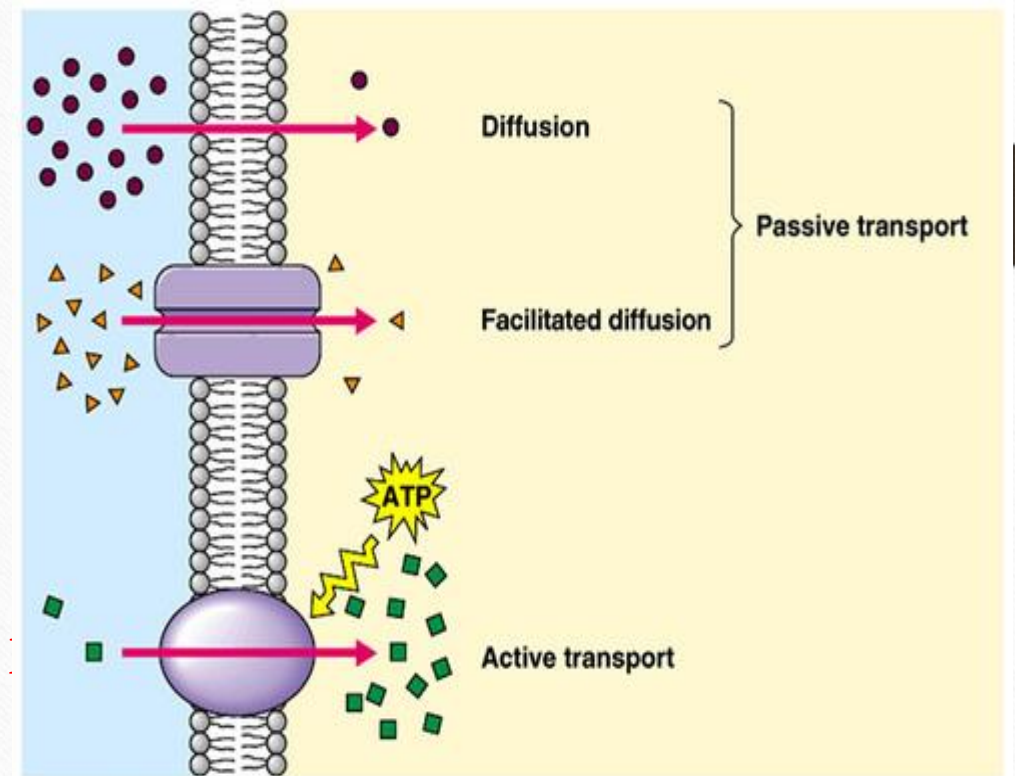
- Plasma(Cell) Membranes job is to let some things in and some things out. It is Selectively Permeable.
- Diffusion happens without the need of Energy or ATP. So things like water cross the membrane automatically.



- Facilitated Diffusion- uses proteins to move ions and small molecules across the plasma membranes.

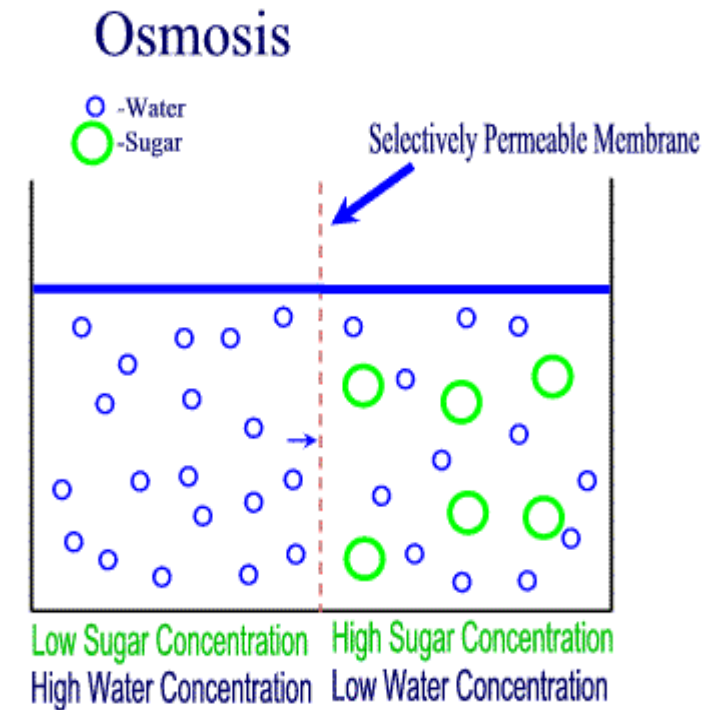
This also requires no ATP or energy.

This happens when we need things like water or Oxygen. **If are cells are low on either, it will move From areas of Hi concentration(outside cell) to the Area (inside the cell.)**



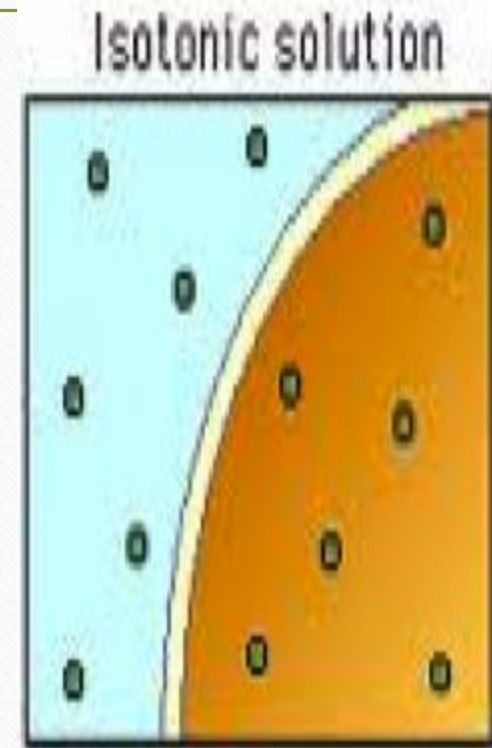
Osmosis

- The diffusion of water is called OSMOSIS.
- Solute is what is dissolved
- Solvent is the substance



Types of Solutions

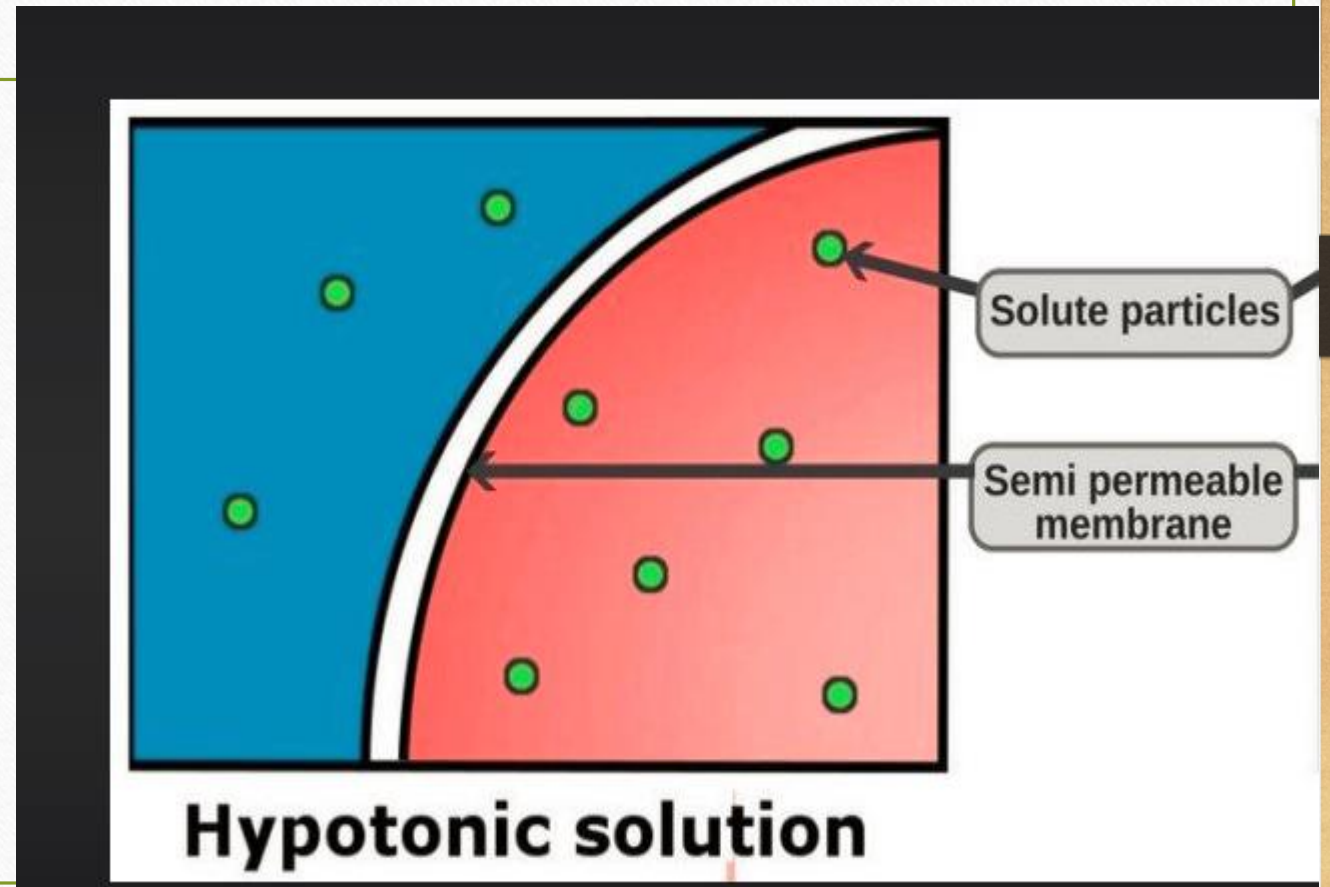
- **Isotonic Solution-** when a cell is in a solution that has the Same concentration as its environment.



Types of Solutions

- Hypotonic Solution
- The cell has more on the inside than on the outside.

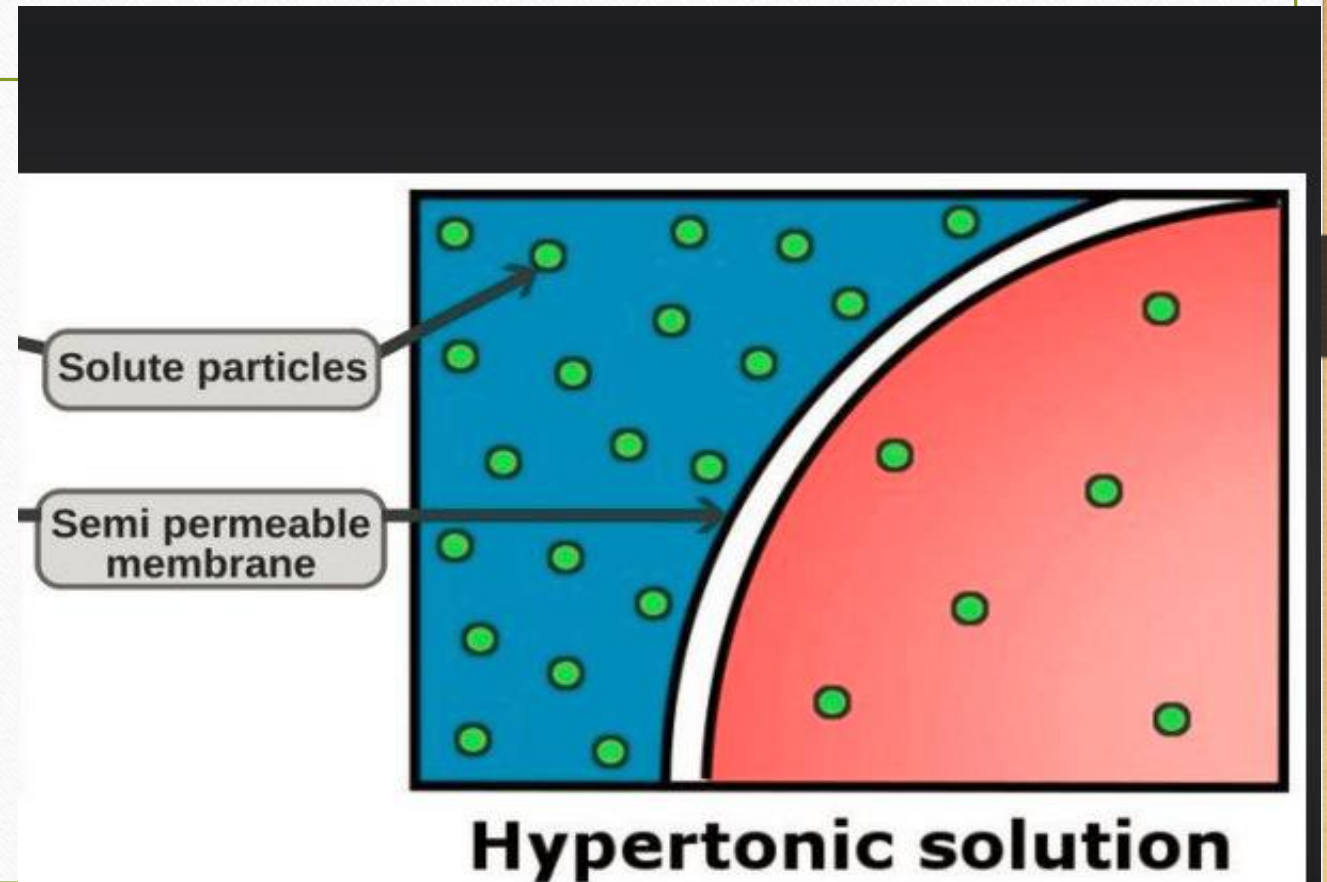
So after you drink a whole bunch of Water, your cells have water and do Not need water from the outside.



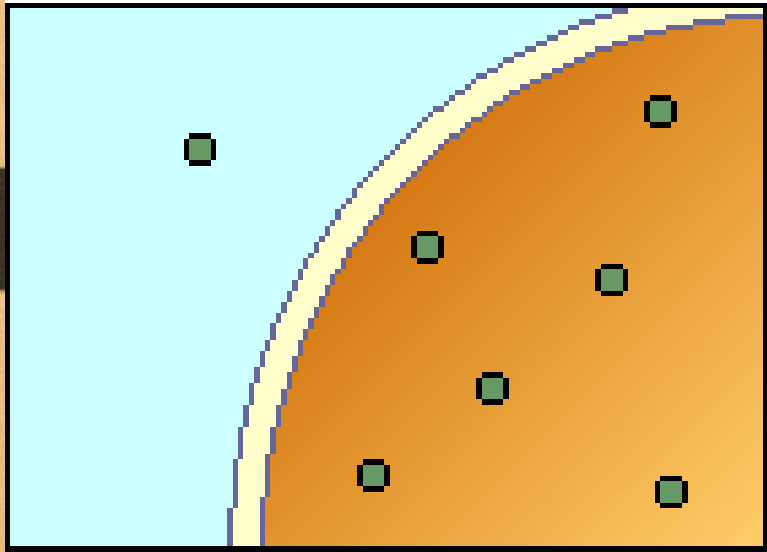
Types of Solutions

- Hypertonic Solution
- The outside of the cell has much more than the inside.

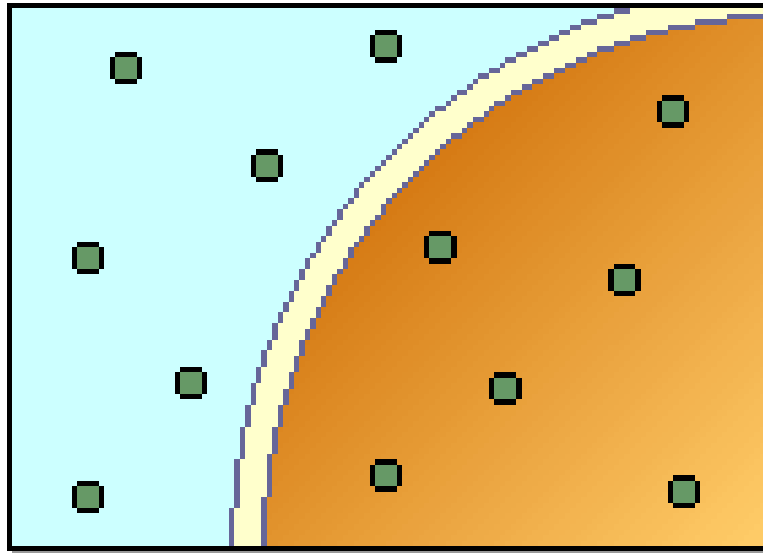
Animal cells shrink . When we are Dehydrated and need water.



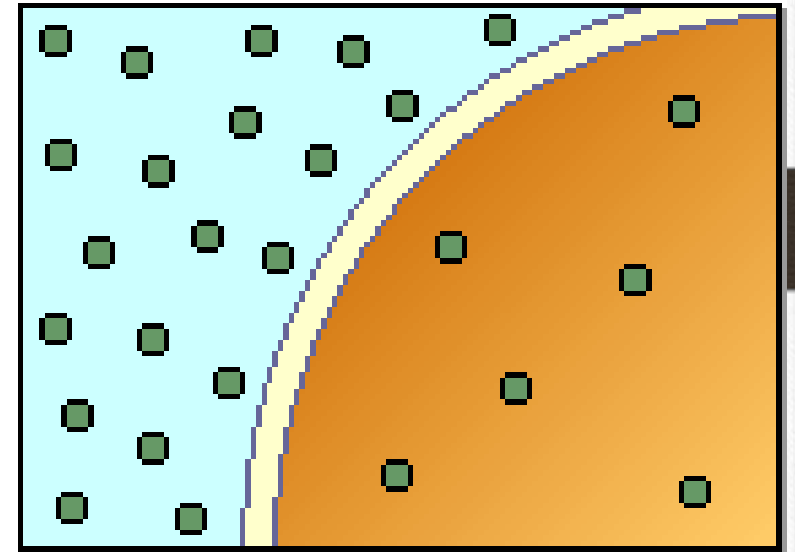
Hypotonic solution



Isotonic solution



Hypertonic solution



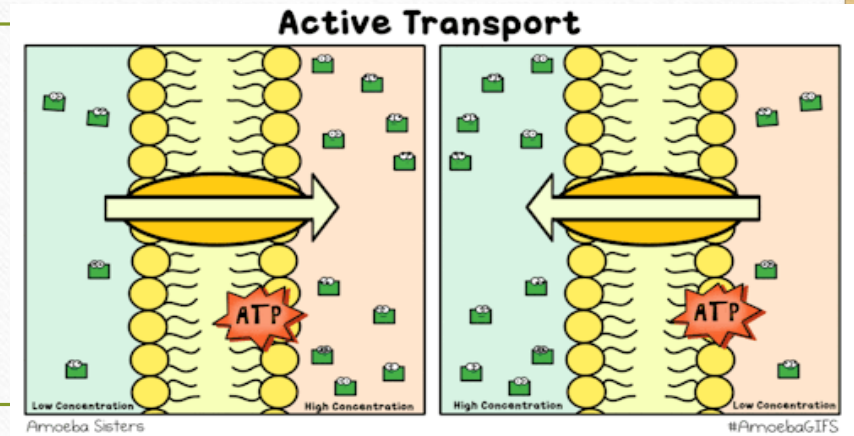
Hypertonic Solution

Isotonic Solution

Hypertonic Solution

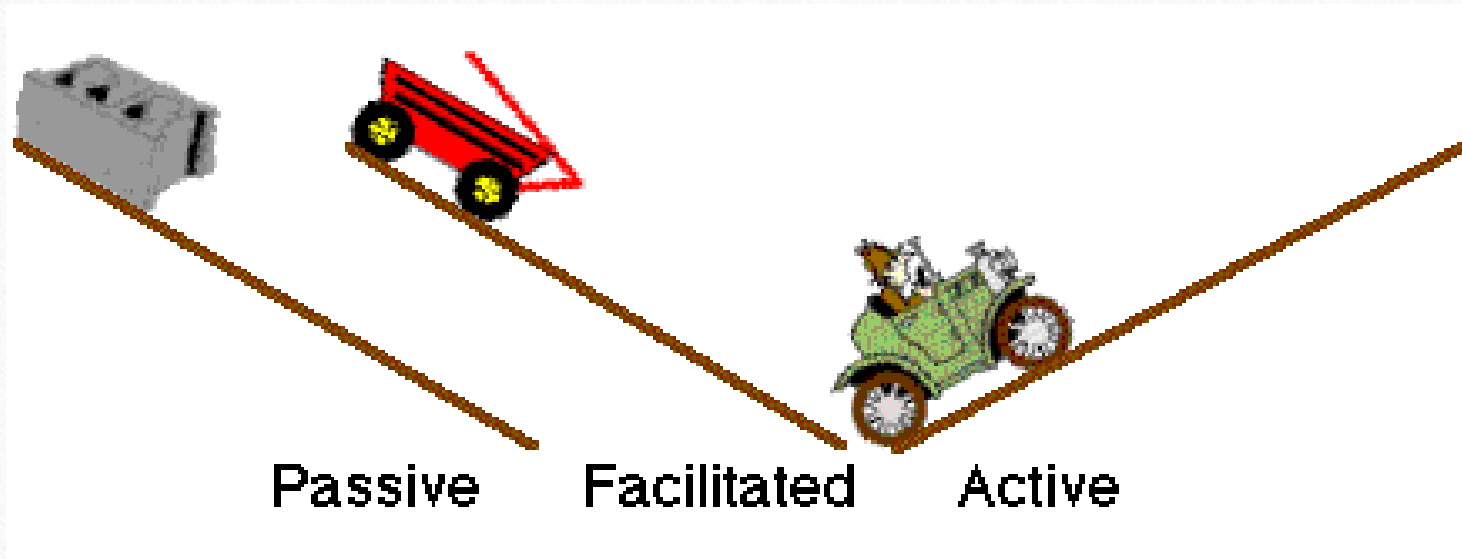
WHICH ONE IS WHICH

Active Transport



- Sometimes molecules move against their normal movements, from hi to low.
- **When things move from areas of low concentration to hi concentration, energy is needed. ATP is this energy.**
- **This movement is called ACTIVE TRANSPORT, movement that requires energy(ATP) across a membrane.**

What does this picture suggest to us?



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Protein pumps actively transport ions across a cell's plasma membrane. What molecule directly supplies the energy required for this transport?

- A. ATP
- B. cholesterol
- C. oxygen
- D. tRNA

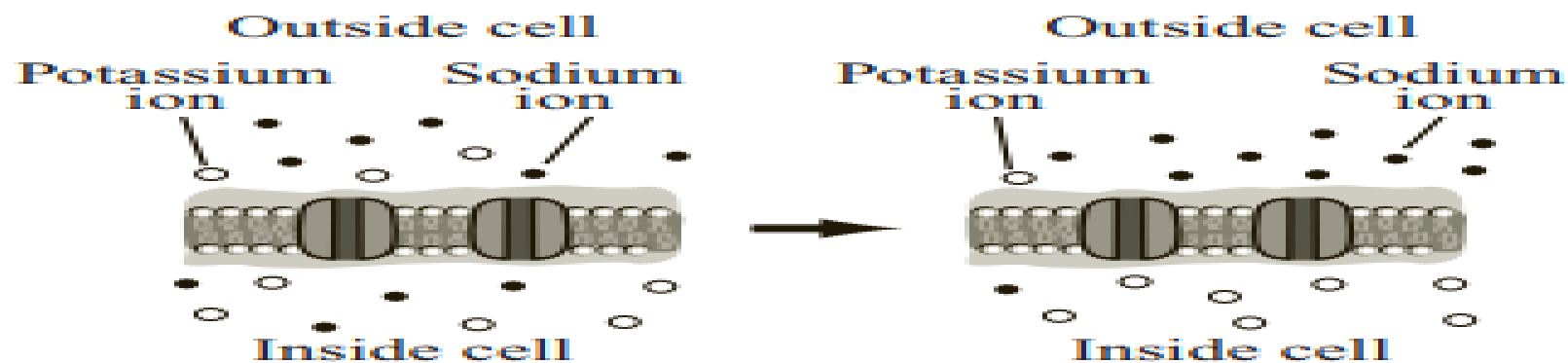
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Which of the following is an example of active transport?

- A. chromosomes migrating during cell division
- B. water diffusing throughout the cytoplasm of a cell
- C. cilia moving rapidly to propel a single-celled organism through water
- D. proteins moving ions from low to high concentration across a cell membrane

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The diagram below shows changes in the concentrations of sodium and potassium ions inside and outside a nerve cell. These changes prepare the nerve cell to conduct an electrical impulse.



Which of the following processes is directly responsible for these changes in the concentrations of sodium and potassium ions inside and outside the nerve cell?

- A. active transport
- B. enzyme activity
- C. osmosis
- D. transcription

