PLANT WATER RELATION

Compiled by

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CELL MEMBRANE

- Substances can cross the membrane because of the membrane's property of being partially permeable
- That means it is permeable to some substances and not to others
- Some substances are able to move into the cell and some are allowed out

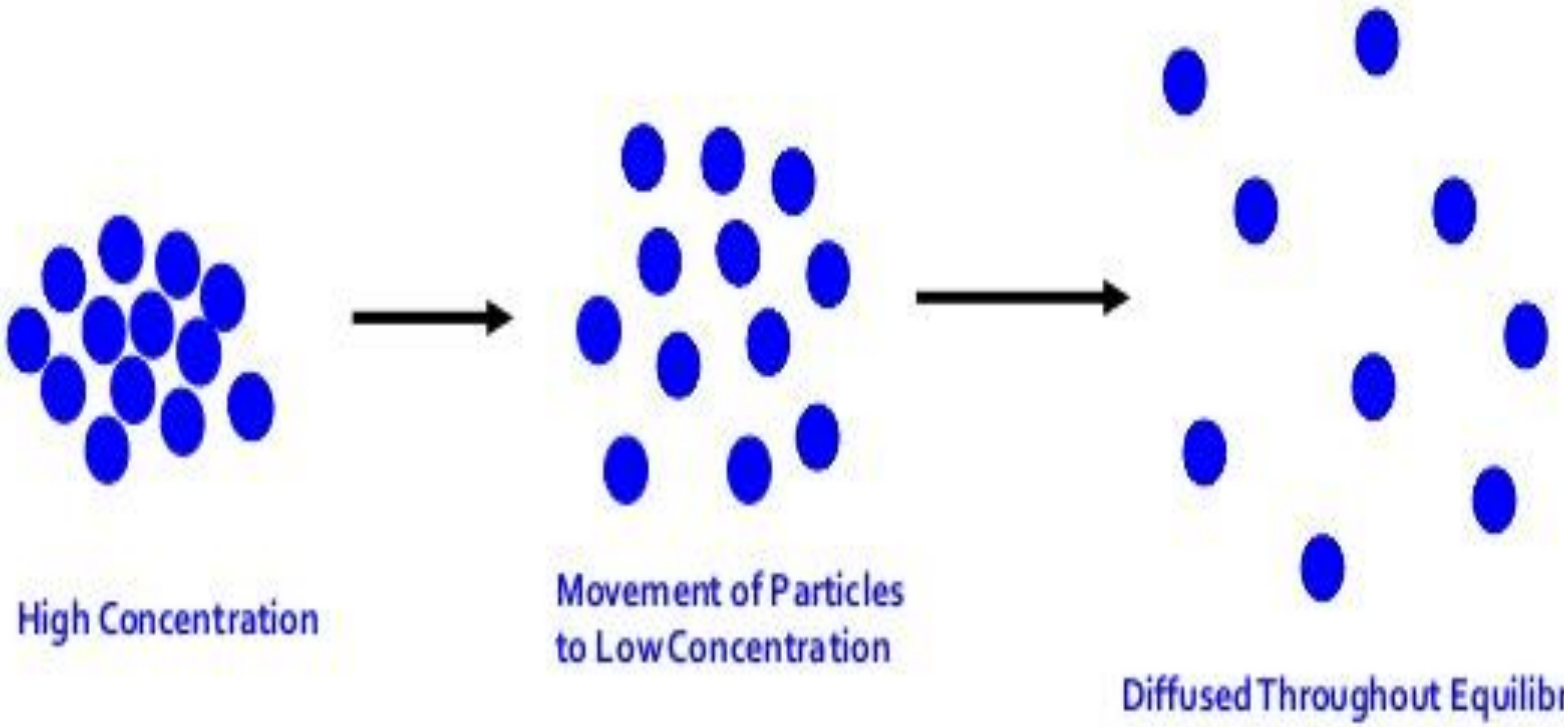
Diffusion

- Movement of molecules from a region of higher concentration to a region of lower concentration down a concentration gradient
- It is a type of passive transport
- Diffusion stops when the concentration gradient is zero that is state of equilibrium is reached

Diffusion

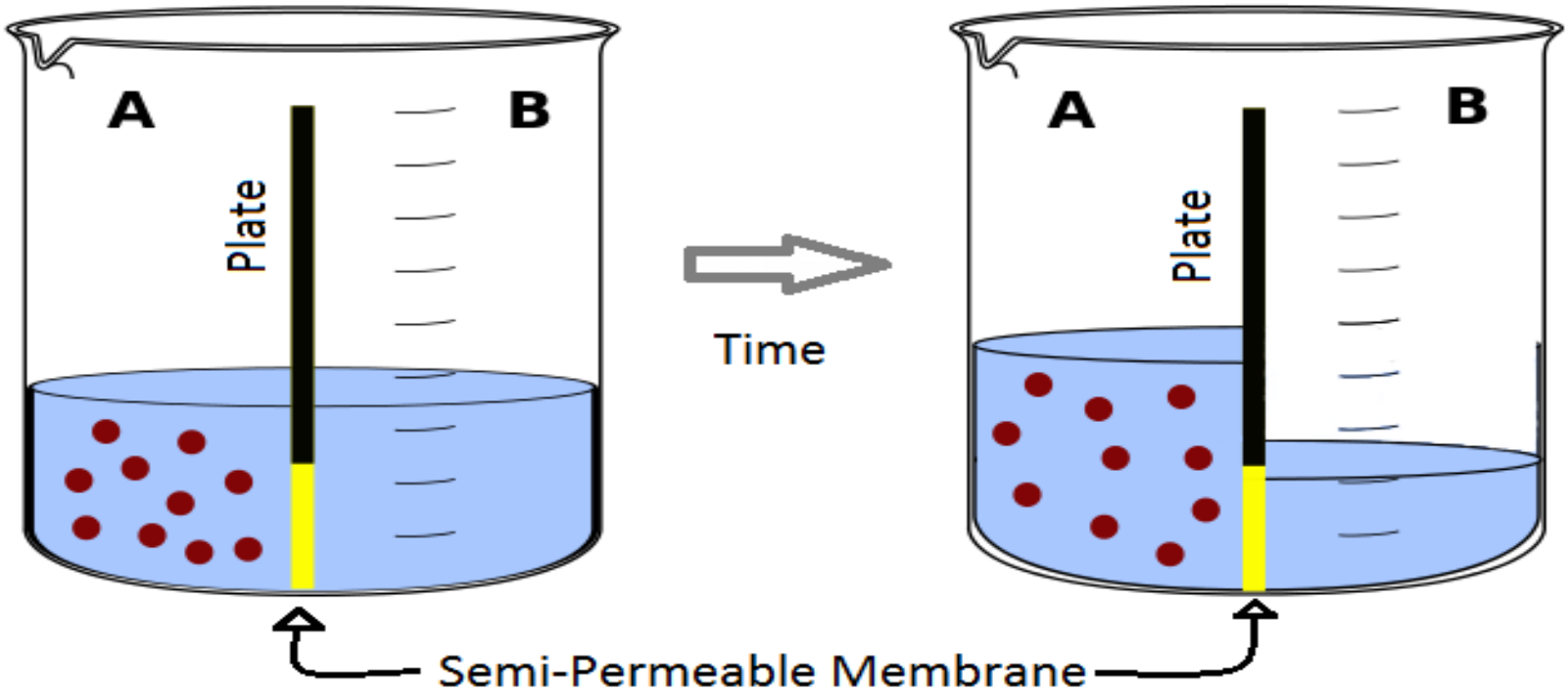
Particle net movement from;

a region of **HIGH** concentration to a region of **LOW** concentration



Osmosis

Movement of Solvent (Water) molecules from its higher concentration to lower concentration through semi permeable membrane is called Osmosis. It is also a type of diffusion.

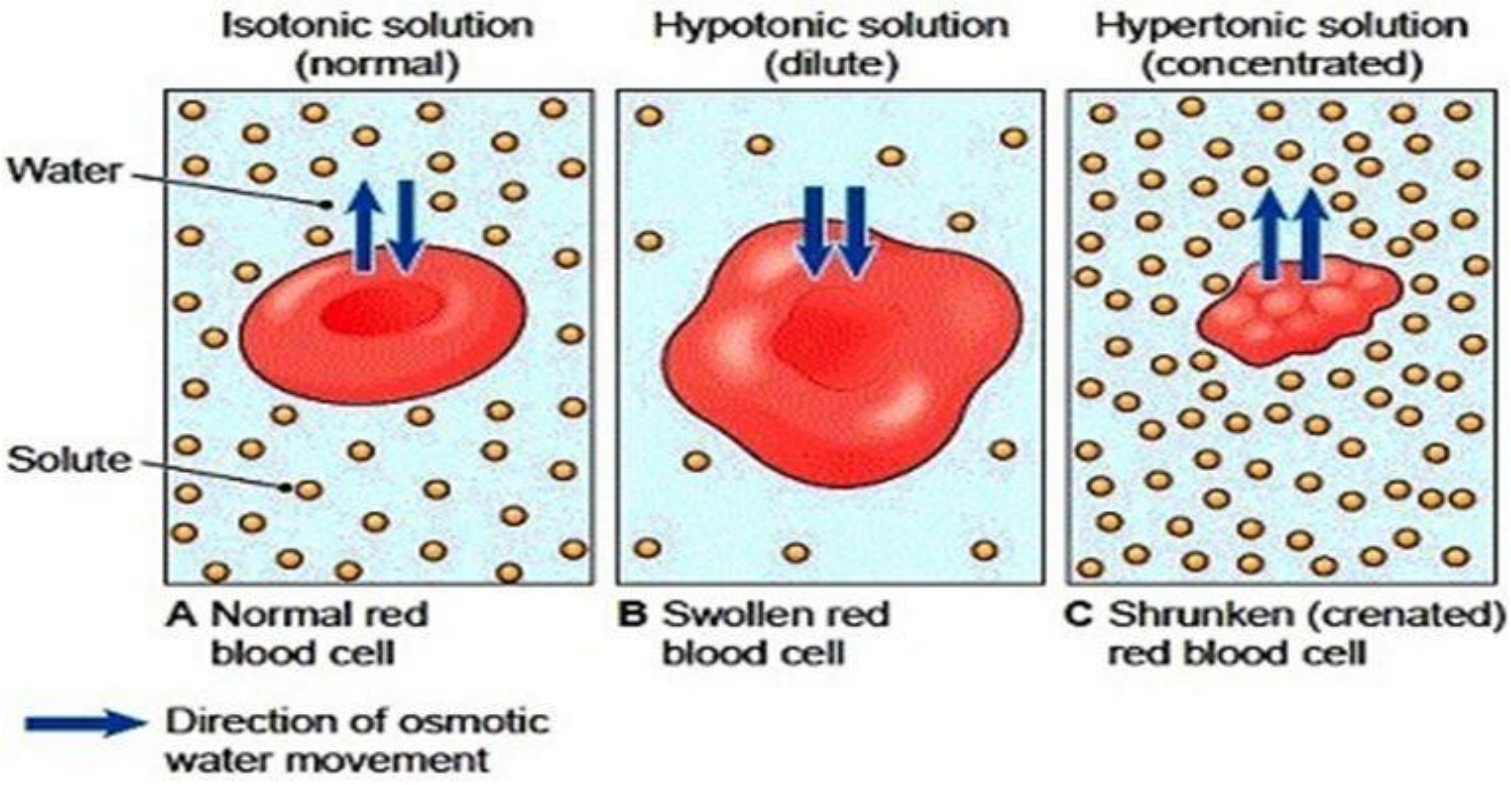


Difference Between Endosmosis And Exosmosis	
Endosmosis	**Exosmosis**
The solvent moves into the cell (Endo = inside)	The solvent moves out of the cell (Exo = outside)
Osmosis towards the inside of a cell	Osmosis towards the outside of a cell
Occurs when there is lower osmotic pressure	Occurs when the osmotic pressure is higher
Hypotonic solutions induce endosmosis in cells (distilled water is hypotonic because it contains no solute)	Hypertonic solutions induce exosmosis in cells (Intravenous Fluid is often hypertonic as it has many solutes)
Higher water potential of the surrounding areas when compared to the cytosol (watery part of a cytoplasm in a cell)	Lower water potential of the surrounding areas when compared to the cytosol
Cells swell as result	Cells shrink as a result
Example: Raisins swell when placed in normal water	Example: Raisins shrivel when placed in concentrated salt solution

Types of Osmosis

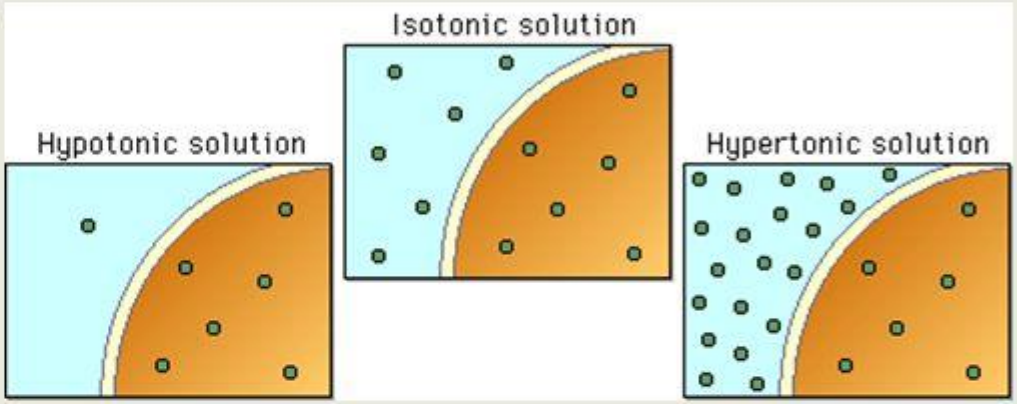
Osmosis across the cell membrane is of two types:

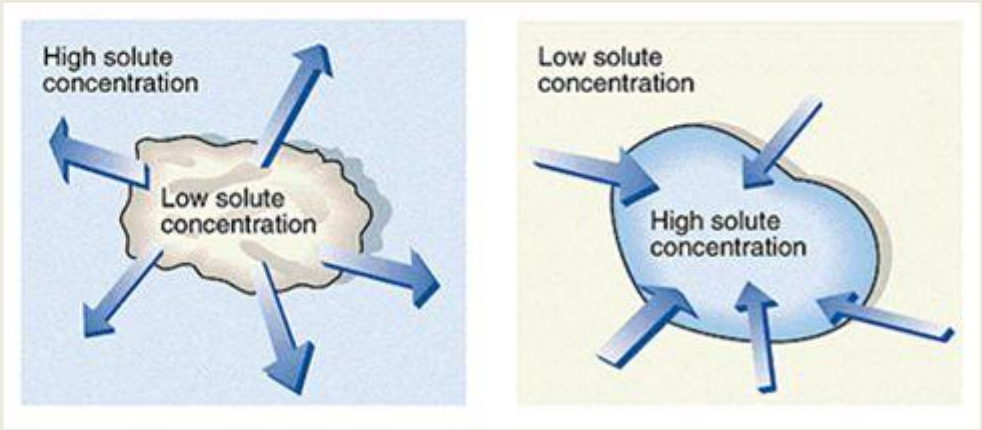
1. Endosmosis: Movement of water into the cell
2. Exosmosis: Movement of water out of the cell.



Osmosis: Movement of Water

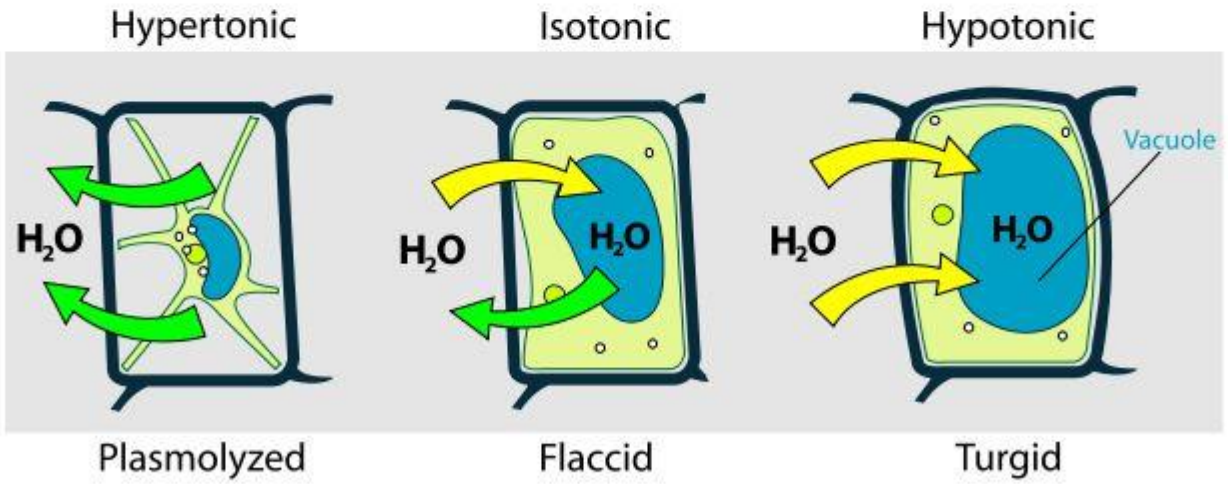
- *Hypotonic Solution*: low solute concentration
- *Isotonic Solution*: equal concentration inside and outside the cell
- *Hypertonic Solution*: high solute concentration
- Water moves in the direction of higher concentration of solute





PLASMOLYSIS

- **Plasmolysis** is the process in plant cells where the plasma membrane pulls away from the cell wall due to the loss of water through osmosis.



What happens to PLANT cells?

Cell in dilute solution becomes:

TURGID

Cell in same concentration of solution.

Cell in concentrated solution becomes:

FLACCID

Cell in a much concentrated solution becomes:

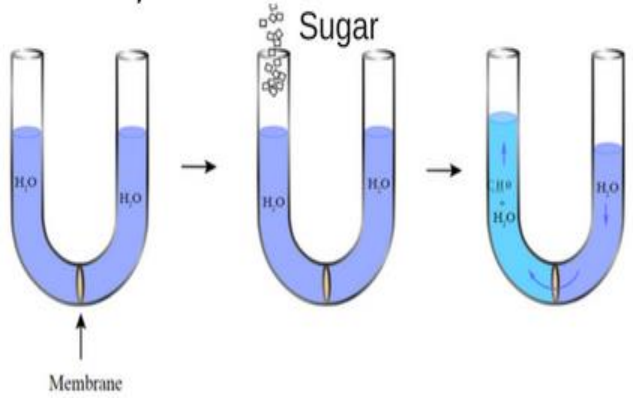
PLASMOLYSED

Osmosis

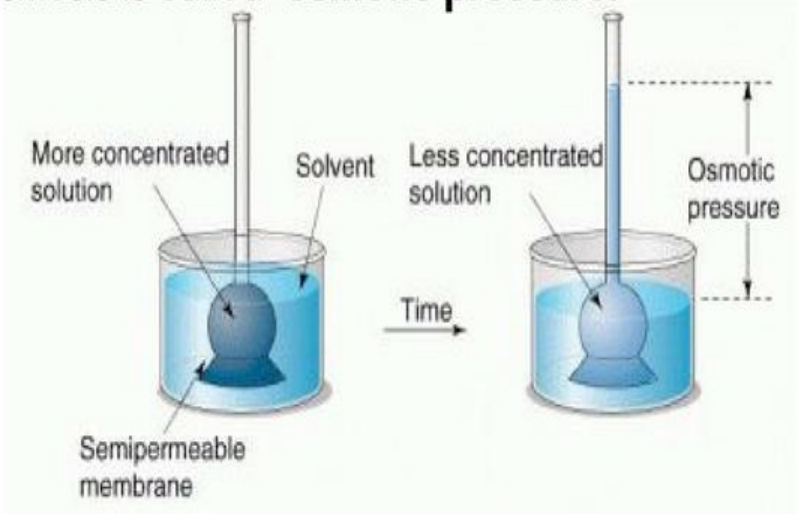
Osmotic Potential

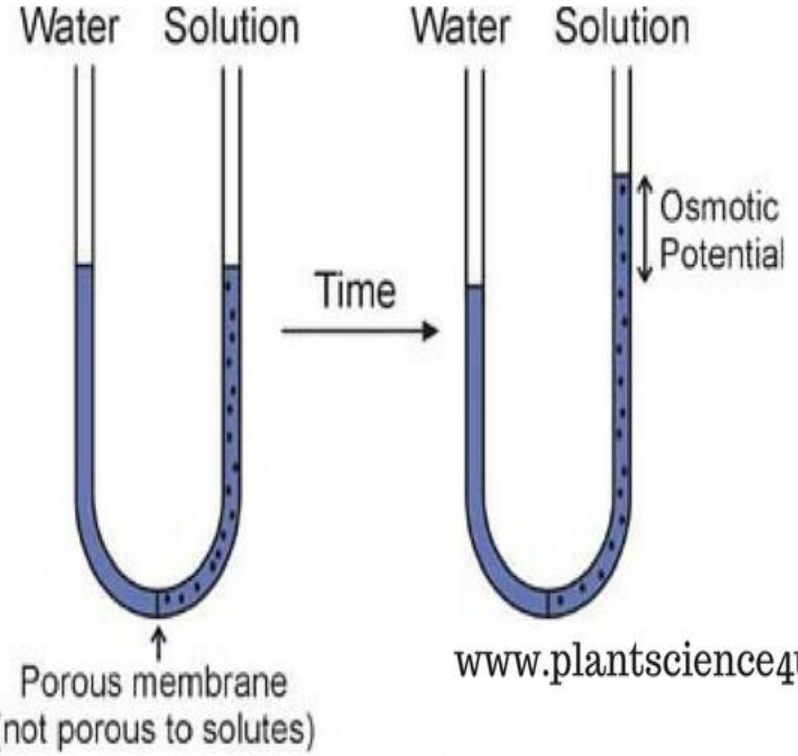
Osmotic Pressure

The movement of water molecules through a semi permeable membrane from the region of higher water potential (dilute solution) to the region of lower water potential (concentrated solution) is called **osmosis.**



The amount of pressure developed by a solution, when it is separated from its solvent by a semipermeable membrane or the amount of pressure required to stop osmosis is called **osmotic pressure.**





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The potential of water molecules to move from a hypotonic solution (low solute concentration) to a hypertonic solution (high solute concentration) across a semi-permeable membrane is called concentration **osmotic potential**