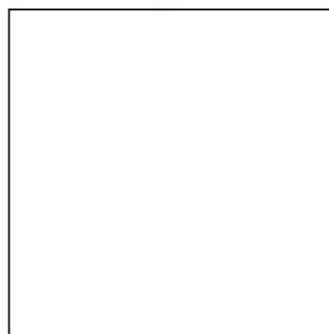
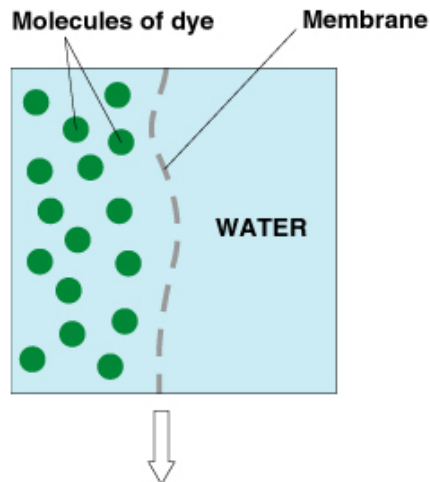


Homeostasis and Transport Notes

Passive Transport – the movement of substances across a cell membrane without the use of cell energy.

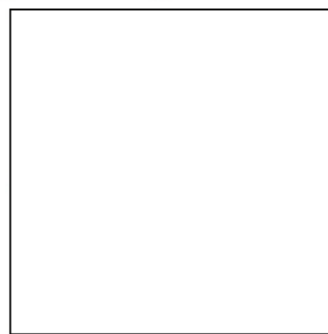
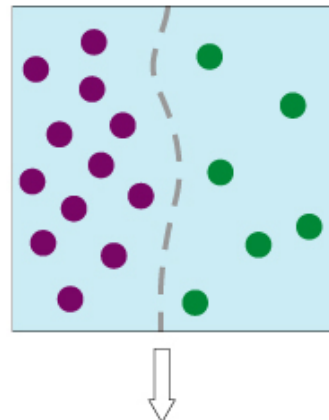
Types of Passive Transport

1. Diffusion - the movement of molecules from an area of higher concentration to an area of lower concentration. This difference in the concentration of molecules across a space is called a concentration gradient.



EQUILIBRIUM

(a) Diffusion of one solute



EQUILIBRIUM

(b) Diffusion of two solutes

2. Osmosis – the process by which water molecules diffuse across a cell membrane from an area of higher concentration to an area of lower concentration.

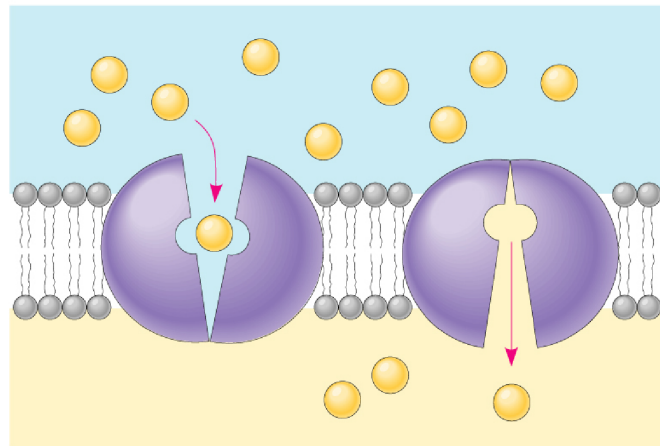
- Hypotonic – describing a solution whose solute concentration is lower than that inside the cell.
- Hypertonic – describing a solution whose solute concentration is higher than that inside the cell.
- Isotonic - describing a solution whose solute concentration equals that inside a cell.

	Hypertonic Solution	Isotonic Solution	Hypotonic Solution
Animal Cell	Shriveled	Normal	Lysed
Plant Cell	Plasmolyzed	Flaccid	Turgid (normal)

- Turgor pressure – the pressure that water molecules exert against the cell wall.
- Plasmolysis – the shrinking or wilting of a cell from the cell wall in a hypertonic environment. Turgor pressure is lost. (Ex: wilting in plants.)

3. Facilitated Diffusion – another type of passive transport; used for molecules that cannot diffuse rapidly. Molecules are assisted by *carrier proteins*.

- Step 1: A carrier protein binds to a molecule on one side of the cell membrane.
- Step 2: The carrier protein changes shape, shielding the molecule from the interior of the membrane.
- Step 3: The molecule is released on the other side of the membrane.



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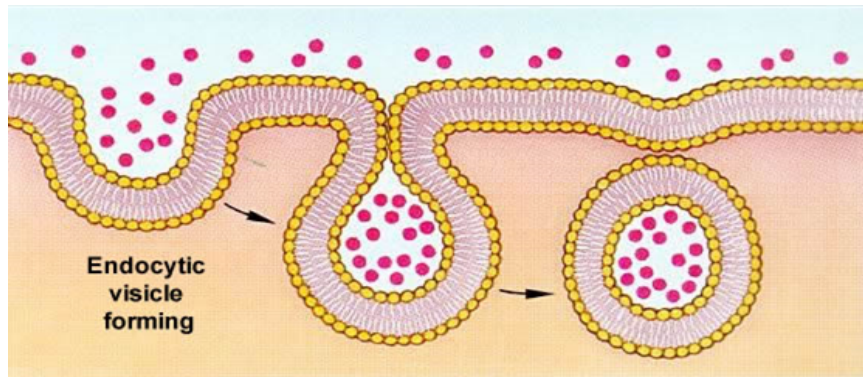
4. Diffusion through Ion Channels – a membrane protein provides a passageway across the cell membrane through which an ion can diffuse.

Active Transport – the movement of a substance across a cell membrane against a concentration gradient; requires the cell to expend energy (ATP).

Examples of Active Transport

1. -Potassium Pump – a carrier protein that actively transports K^+ ions into and Na^+ ions out of the cell.

2. Endocytosis – the process by which cells ingest external fluid, macromolecules and large particles, including other cells, by surrounding and engulfing the substances.



- a. Pinocytosis – engulfing of solutes or fluids
 - b. Phagocytosis – engulfing of large particles or whole cells
- *Phagocyte* – a cell that engages in phagocytosis.

3. Exocytosis – a process by which a vesicle inside a cell fuses with the cell membrane and releases its contents to the external environment.

