¹ ■ Homeostasis and Cell Transport

Homeostasis = steady state

² Passive Transport

■When substances can pass through a cell membrane <u>without</u> any input of <u>energy</u>

3 Diffusion

■ Molecules move from an area of high concentration to an area of low concentration until they reach equilibrium

Diffusion Across Membranes

- Simple diffusion when only certain molecules can pass through a membrane from a high concentration to low
- Depends on size, type and chemical nature

5 Osmosis

- When water molecules diffuse across a membrane from an area of high concentration to low
- The solution is the water and the solvent is the NaCl

6 ☐ Direction of Osmosis

- Depends on the concentration of the solutes
- Isotonic solutes equal in an out of cell
- Hypotonic solutes lower outside than in cell
- Hypertonic solutes higher outside cell

⁷ How cells deal with osmosis:

- Water tends to diffuse from hypotonic solutions to hypertonic
- Plants cells thrive in hypotonic environments
- Some cells have ways to expel excess water

- Used for molecules that can't diffuse through the membrane
- Use carrier proteins in the membrane
- Proteins transport molecules from an area of high concentration to low in or out of cell

Diffusion Through Ion Channels

- Transports ions from high concentration to low
- Can't pass through membrane important for cell functions
- Channels open and close as needed
- Ion specific

10 Active Transport

■ Carrier proteins act as cell membrane pumps and move molecules from low conentrations to high – against the concentration gradient



11 Sodium – Potassium Pump

- Carrier proteins transport Na ions and K ions up their concentration gradients
- Exchange three Na+ ions for two K+ ions
- Creates and electrical gradient outside is positive charged inside negative
- Important for the conduction of electrical impulses along nerve cells

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13 Movement in Vesicles

Endocytosis and Exocytosis

- To move large molecules in and out of cell
- Or to move large amounts of smaller molecules in or out of cells

14 Endocytosis

The process by which cell ingest external fluid, macromolecules and large particles including other cells.

15 Endocytosis: Two main types

- 1. Pinocytosis = the movement of solutes or fluids
- 2. Phagocytosis the movement of large particles or whole cells
 - Many unicellular cells feed by phagocytosis

16 Exocytosis

- The process by which a substance is released from the cell
- Usually large molecules or waste
- Vesicle fuses with the cell membrane
- Deliver the molecules outside of the cell