noor.hamed@mustaqbal-college.edu.iq

Molecule Movement & Cells

- Passive Transport
- Active Transport
- Endocytosis
  (phagocytosis & pinocytosis)
- Exocytosis

Passive Transport

- No energy required
- Move due to gradient
  – differences in concentration, pressure, charge
- Move to equalize gradient
  – High moves toward low

Medical Laboratory Techniques Department
Lec. 3: Molecules movement across plasma membrane
noor.hamed@mustaqbal-college.edu.iq

Types of Passive Transport

1. Diffusion

2. Osmosis

3. Facilitated diffusion

noor.hamed@mustaqbal-college.edu.iq

Diffusion

- Molecules move to equalize concentration

noor.hamed@mustaqbal-college.edu.iq

Osmosis

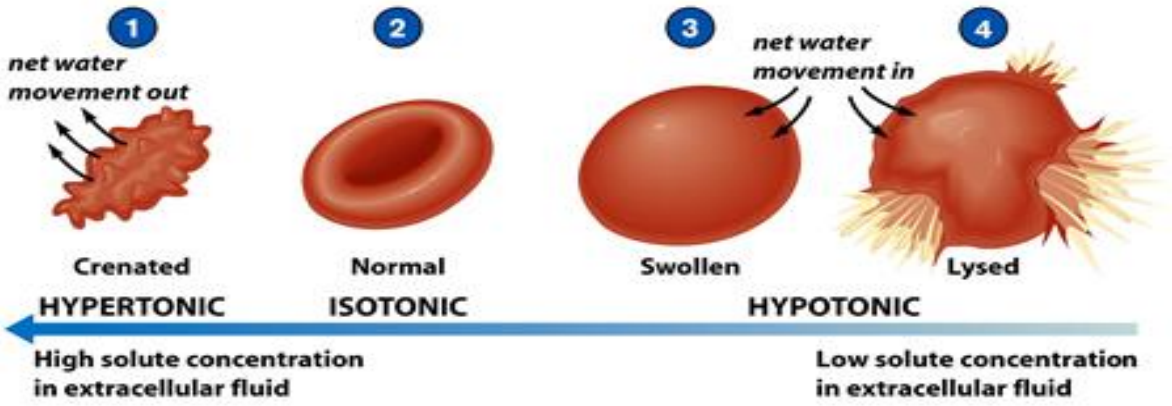
- Special form of diffusion
- Fluid flows from lower solute concentration
- Often involves movement of water
  - Into cell
  - Out of cell

Solution Differences & Cells

- solvent + solute = solution
- Hypotonic
  - Solutes in cell more than outside
  - Outside solvent will flow into cell
- Isotonic
  - Solutes equal inside & out of cell
- Hypertonic
  - Solutes greater outside cell
  - Fluid will flow out of cell

Lec. 3: Molecules movement across plasma membrane

noor.hamed@mustaqbal-college.edu.iq



noor.hamed@mustaqbal-college.edu.iq

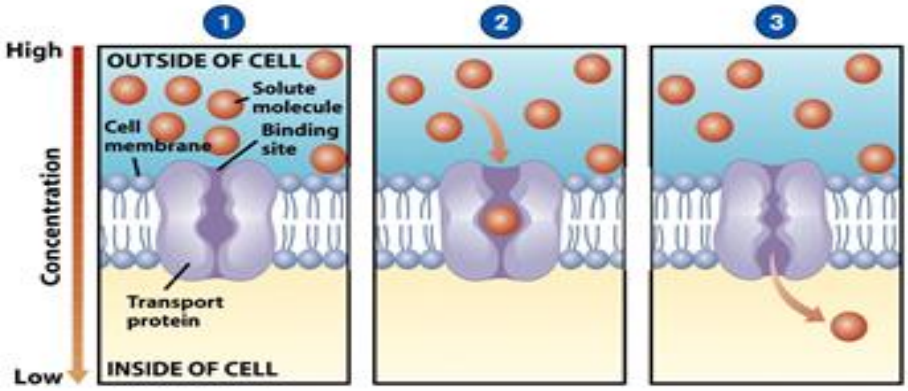
Facilitated Diffusion

- Differentially permeable membrane

- Channels (are specific) help molecule or ions enter or leave the cell
- Channels usually are transport proteins (aquaporins facilitate the movement of water)
- No energy is used

Process of Facilitated Transport

- Protein binds with molecule
- Shape of protein changes
- Molecule moves across membrane



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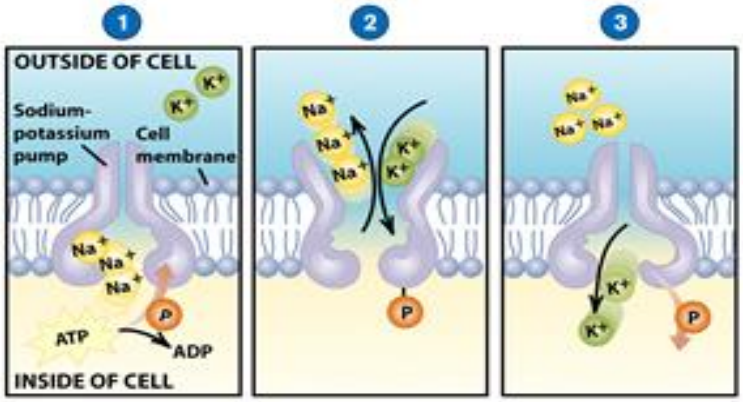
Active Transport

- Molecular movement
- Requires energy (against gradient)
- Example is sodium-potassium pump



noor.hamed@mustaqbal-college.edu.iq

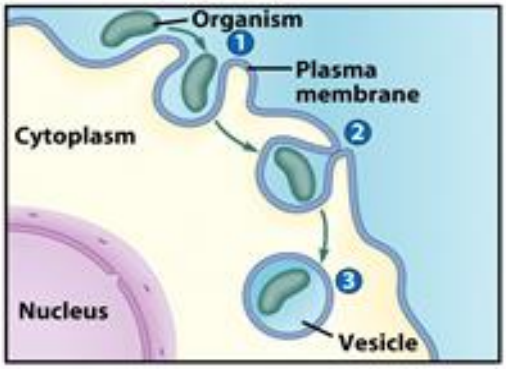
Endocytosis

- Movement of large material
  - Particles
  - Organisms
  - Large molecules
- Movement is into cells
- Types of endocytosis
  - bulk-phase (nonspecific)
  - receptor-mediated (specific)

noor.hamed@mustaqbal-college.edu.iq

Process of Endocytosis

- Plasma membrane surrounds material
- Edges of membrane meet
- Membranes fuse to form vesicle



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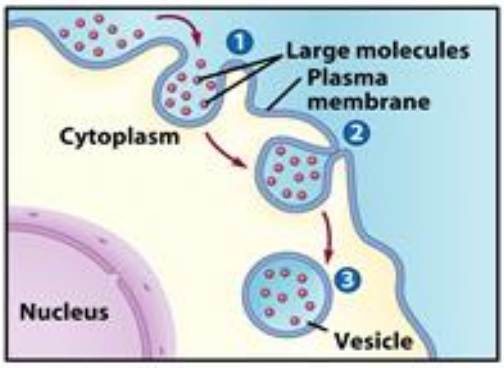
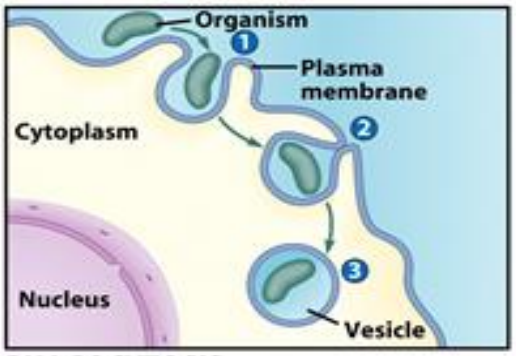


PINOCYTOSIS

noor.hamed@mustaqbal-college.edu.iq

Forms of Endocytosis

- Phagocytosis – cell eating
- Pinocytosis – cell drinking



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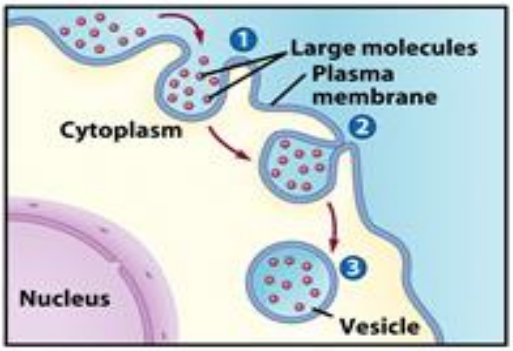
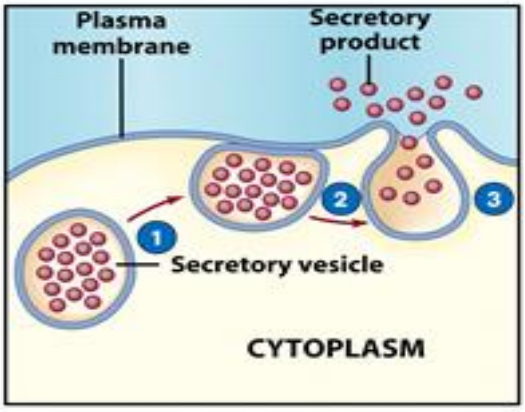


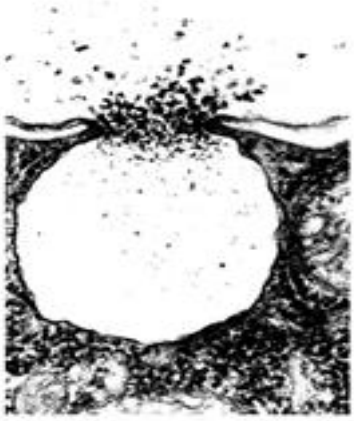
PINOCYTOSIS

noor.hamed@mustaqbal-college.edu.iq

Exocytosis

- Reverse of endocytosis
- Cell discharges material





noor.hamed@mustaqbal-college.edu.iq

Exocytosis

- Vesicle moves to cell surface
- Membrane of vesicle fuses
- Materials expelled