RAD 223

Radiography Physiology

Lecture Notes

Second lecture: Cell physiology

Movement across-cell membrane

Movements a cross membrane takes place in two ways.

These are passive and active movements. Passive movement does not use energy whereas active movement consumes energy in the form of ATP (Adenosine Tri Phosphate).

Passive movement: includes

a) *Simple diffusion*, the random movements of molecules from area of high concentration to the area of low concentration. Example air in alveoli of lung

b) *Facilitated diffusion,* larger molecules, which are not soluble in lipid need protein channel to pass through the plasma membrane. No direct energy needed. Example: - Amino acid passes through the cell membrane.

c) *Osmosis,* a special type of diffusion referring to the passage of water through a selectively permeable membrane from an area of high water concentration to lower water concentration.

d) *Filtration,* small molecules pass through selectively permeable membrane in response to force of pressure. Example: - filtration in the kidney in the process of urine formation.

Active movements across membranes

Substances move through a selectively permeable membrane from areas of low concentration on side of a membrane to an area of higher concentration on the other side. This is against concentration gradient. Therefore, it requires energy.

a) *Active Transport*: till equilibrium substances could more by passive movement. But if equilibrium reached and still more molecules are needed, they must be pumped through the membrane against concentration gradient.

   This process requires the use of ATP. One example of such processes is Sodium – potassium pump and calcium pump. In this process all follows similar process. These are molecules bind to carrier protein, molecule- carrier complex pass through the membrane, assisted by an enzyme & ATP and carrier protein returns to its original shape & repeat the process.

b) *Endocytosis,* pocketing in by plasma membrane. It includes: Pinocytoss – cell drinking Receptor – mediated Endocytosis- Endocytosis with the help of receptor.

   Phagocytosis- cell eating.

c) *Exocytosis, o*pposite to Endocytosis, to remove out undigested particles.