

week 4

TRANSPORT SYSTEM I

Transport system is the movement of metabolic materials from various parts of an organism where they are produced and transported to other parts where such are used, stored or removed from the body.

Diffusion

Diffusion can be defined as the process by which molecules or ions of a substance (gas, solid and liquids) move from a region of high concentration to a region of low concentration until they are evenly distributed.

Factors Affecting Diffusion

1. State of matter: diffusion varies with the three state of matter. The diffusion of gases is much faster than that of liquids because, gas molecules are freer and therefore faster than liquid molecules.
2. Molecular size: the smaller the molecules, the faster the rate of diffusion while the larger the molecule, the slower the rate of diffusion.
3. Surface area/ volume ratio: when the surface area to volume ratio is high, the distance from the environment into the cell and from the cell to the environment is short, diffusion can easily take place.
4. Temperature: high temperature increase the speed at which molecules move.

Osmosis

Osmosis is the flow of water or solvent molecules from a region of dilute or weak solution to a region of concentrated or stronger solution through a semi-permeable membrane.

Need for Transportation:

All living organisms (plants and animals) need transport system for the following reasons

- To obtain essential materials such as oxygen, water and nutrients.
- To remove metabolic waste such as carbon dioxide, urea, water, etc.
- For moving water and mineral salts from the soil through the roots to the various parts of plant.
- For transfer of hormones from production site to site of action.
- For transfer of glucose to various parts of plants.

- Regulation of water balance in animals
- Regulation of the body temperature etc

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Transport Materials In Animals

	Materials Transported	Source	Destination
1	Oxygen	Lungs	All living cells of the body
2	Carbon dioxide	Body cells	Lungs
3	Urea	Body cells	Liver
4	Excess salts	Body cells	Skin and kidney
5	Water	Body cell	Skin, lungs, liver, kidney etc
6	Amino acid	Small intestine	Body cells
7	Vitamins	Small intestine	Body cells
8	Sugar	Body cells	Body cells
9	Fatty acid and glycerol	Small intestine	Body cells
10	Mineral salt	Small intestine	Body cells
11	Hormones	Endocrine glands	Target organs of tissue
12	Antibodies	White blood cells	All body parts

Transport Materials in Plants

Materials Transported	Source	Destination
Manufactured food	Leaves	All body cells
Excretory Products (CO ₂ and water)	All living cells	Site of excretion e.g. stomata
Water (absorbed)	Soil	Leaves and other parts of the leaves

Other materials transported in plants are:

1. Oxygen
2. nitrogen waste products (latex)
3. amino acids
4. glucose
5. lipids
6. auxins (hormones)
7. mineral salts