Exchanging Substances

- In Single cell organism gases are easily diffuse in and out of the membrane due to the large surface area.
- ► In Multi Cellular organisms due to small surface area gases are not diffuse easily that's why they need some sort to exchange substances

> Effectiveness of Exchange surfaces:

- a) short distance to diffuse due to thin membrane
- b) a lot of substances can diffuse due to large surface area

c) exchange surface in animal have a lot of blood vessels to get substances in or out of blood quickly

d) exchange surface in animal are ventilated(air in or out) too.



1- Gaseous exchange in the Lungs:

 Function of lungs is to transfer the oxygen to blood and remove carbon dioxide from the blood by Sac like structure Called Alveoli.

> Characteristics of Alveoli:

- a) Large surface area (75m2 in humans)
- b) Thin wall for quick absorption
- c) moist lining for dissolved gases.
- d) good blood supply

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2- Gaseous Exchange in the Gut (Small intestine)

- > There are a lot of little structure in the small intestine called Villi.
- > They digest food more quickly by increasing surface area.
- Characteristics of Villi:
 - a) single layer of surface cell
 - b) large surface area more easily absorption



3- Gaseous Exchange from Gills (fishes)

➤ Gills are the gaseous exchange surface in fish. When fish take in water from the moth. Oxygen diffuses from the water into the blood and carbon dioxide diffuses

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from the blood to water.

- Each gills have many tiny structure called Gills filament that give large surface area for exchange.
- ► Each Gills Filament have a lot of tiny structure called Lamellae give big surface area for exchange gases. Lamellae has network of blood capillaries which speed up the diffusion rate.
- ► It has also thin surface layer that minimise the distance of Gaseous diffusion
- > The concentration of Oxygen in water is always higher than blood.



4- Gaseous Exchange from leaves

- ► Carbon dioxide diffuses into the air spaces within the leaves where photosynthesis occur
- ► leaf structure:

a) Underneath of leave there is a big surface which covers with tiny holes known as Stomata.

b) opening and closing of stomata is controlled by Guard cell depends on how much water is taken in or out

c) exchange surface area depends on size or shape of the leave(flattened shape increase surface area).

d) wall inside the leave also give exchange surface.

e) Air surface inside the leave also help to exchange gases.

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