HW-2

Date
Page

(1) How O_2 & CO_2 transported in Human body?

For consuming O_2 along with other gases enter the blood passing through

Nostrils → Nasal cavity → Trachea

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Alveoli ← Bronchioles ← Bronchus

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(O_2 Diffused to RBC) (Oxyhaemoglobin)

Then the O_2 & further used up as metabolic fuel and the metabolic wastes CO_2 & H_2O vapour are further transported through RBCs (Haemoglobin) (Carboxyhaemoglobin) back to alveoli and diffused to enter into & further exhaled out

(2) How are lungs designed in human beings to maximise the area for exchange of gases?

(a) Lungs have fortfuen divisions (ie tubes, tubules) to maximise the area of gaseous exchange

(b) Lungs are divided into too small tubes called bronchi which further are divided into bronchioles (tubules)

(c) All the ends of bronchioles/sac like structure are present. They are called as Alveoli. These sacs might appear very tiny but they are present in a huge amount (millions). Thus serving a large surface area for exchange of gaseous altogether.

(3) How alveoli are designed for exchange of gases?

Alveoli and balloon like air sacs that are made up of simple squamous Epithelium. It has a thin cell wall to facilitate gaseous exchange. The presence of millions of alveoli in the lungs provided max area for gaseous exchange between the air in the lungs and the blood in the surrounding capillaries

oxygen diffuses across the alveolar and capillary wall into the blood stream capillary wall into the blood stream while CO_2 diffuses from blood across mentioned wall into the alveoli

(4) What are the different ways in which glucose is oxidised to give (provide) energy in various organisms

Breaking down of glucose involves 2 process. In the first step, it is broken into 3 pyruvate molecules. These pyruvates further breakdown to provide energy in the following different ways in various organisms

(a) Aerobic Respiration

In this case, pyruvate is broken down into H_2O and CO_2 along with release of energy. It commonly occurs in mitochondria of cells. It takes place in the presence of O_2. ATP count (36-38)

Aerobic respiration

In the break down of O_2 takes place in absence of O_2. Where the pyruvate break down to provide energy along with ethanol/lactic acid and CO_2. ATP count (2 ATP)

(5) What advantage over an aquatic organism does a terrestrial organism have with regard to obtaining O_2 from respiration?

Air (atmosphere) contains 21% of O_2 while H_2O has only 1% of O_2 in dissolved state. Thus a terrestrial organism is provided with much more amount of O_2 than the aquatic organism. This is the reason that terrestrial organisms have the advantage of getting more O_2 than aquatic organism.

(6) Why is trachea provided with cartilaginous rings?

In the trachea (wind pipe) there are several cartilaginous rings called as tracheal rings or tracheal cartilage

Those cartilaginous rings protect against the collapsing, thus preventing the windpipe from collapsing while breathing in and out. It helps support the trachea, allowing it to move and flex during breathing and they keep the lumen of the trachea open while breathing.