Transport of Oxygen to tissue:

Oxygen is carried in the blood to the tissue in two from:

i) Oxyhaemoglobin (97%): it is a chemical combination of O2 with haemoglobin

Hb4 + 4O2…… Hb4O8 (oxyhaemoglobin)

Hb4 +O2----Hb4O2+O2----Hb4O4+O2---Hb4O6

Hb4O6+O2=Hb4O8

4Fe2+ +4O2=FE3+

1.PP of O2 2.PP of CO2 3.TEMERATURE 4.H+ ION 5.AFFINITY OF Hb4 TO O2

100 ML BLOOD 14.5 mg Hb4; 1 GRAM OF Hb4 COMBINES WITH 1.34 ML O2. 100 ML BLOOD CARRIES (14.5 X 1.34)=19.43 ML O2 .

ii) Solution in plasma water (3%): O2 dissolve in plasma of blood and carried to tissues.

when the level of O2 is high in blood, it combines with haemoglobin to from oxyhaemoglobin.

Oxyhaemoglobin is unstable, and under certain conditions readily dissociates releasing oxygen. Factors that increase

dissociation include low O2 levels, low pH and raised temperature.

Internal respiration:

Internal respiration is exchange of gases which takes places in tissue, so also known as cellular respiration.

In tissue, oxygen carried in the form of Oxyhaemoglobin get dissciated to liberating free O2.

Hb4O8———dissociates to give ——— Hb + O2

PP O2 95 MMHG BLOOD……PP O2 TISSUE CELL…40 mmHg.

The free O2 then oxidized the glucose in the presence of respiratory enzymes to liberate CO2, water and energy.

C6H12O6 + 6O2 ———- 6CO2 + 6H2O (METABOLIC WATER)+ Energy

Energy is utilized by the tissue for its vital activities, while the CO2 is diffused from the tissue.

PP CO2 TISSUE CELLS ..45 mmHg…PP CO2 IN BLOOD….40 mmHg.

Transport of Carbondioxide from tissue to lungs:

Carbon dioxide is one of the waste products of metabolism.

It is excreted by the lungs and is transported by three mechanisms:

i) as Carbonic acid (H2CO3) (7%): some CO2 dissolved in the plasma to form carbonic acid

carbondioxide mixed with water of blood plasma to form carbonic acid.

$CO_2 + H_2O \longrightarrow H_2CO_3$

ii) Bicarbonate ions (HCO_3^-) in the plasma (70%):

carbonic acid formed in blood plasma quickly ionizes to from bicarbonates and hydrogen ions in the presence of enzyme carbonic anhydrase(FASTEST ENZYME).

$CO_2 + H_2O \longrightarrow H^+ + HCO_3^-$

bicarbonate ions combined with sodium or potassium present in blood to form sodium bicarbonate ($NaHCO_3$) or Potasssium bicarbonate ($KHCO_3$) and transported in this form.

$Na^+ + HCO_3^- = NaHCO_3$

$K^+ + HCO_3^- = KHCO_3$

iii) as Carbaminohaemoglobin (23%): some CO_2 combines with Haemoglobin to form carbaminohaemoglobin in RBCs.

$CO_2 + NHbNH_2 \longrightarrow HbNH.COOH$ (carbaminohaemoglobin).

finally, CO_2 are carried to lungs and expelled out by expiration process of breathing.

HYPOXIA: LACK OF O_2 IN CROWDED PLACE…..

ASPHYSIATION: STRANGULATION…..CO_2% INCREASES.