

Red Blood Cell

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Objectives

1. Describe the structure and function of RBCs
2. Describe structure of Hemoglobin
3. How Hemoglobin attach and release O₂ and CO₂
4. Blood Types

Structure of RBCs

- Biconcave shape
- Large surface
- Center is $< \frac{1}{2}$ the maximum width
- Lack organelles
 - No nucleus
 - No Ribosomes
 - No mitochondria (energy come from hexo monophosphate shunt)

RBCs Structure

- RBCs can change in shape.
 - High surface to volume
 - Viscosity of cytoplasm
 - Mechanical property of membrane
- RBC squeeze to get into capillaries
- 20-30 trillion RBC in blood

Function of RBCs

- Major function
 - Transport of O₂ and CO₂, with help of hemoglobin

- Minor Function
 - Excellent Acid-Base Buffer
 - Carbonic anhydrase

Hemoglobin

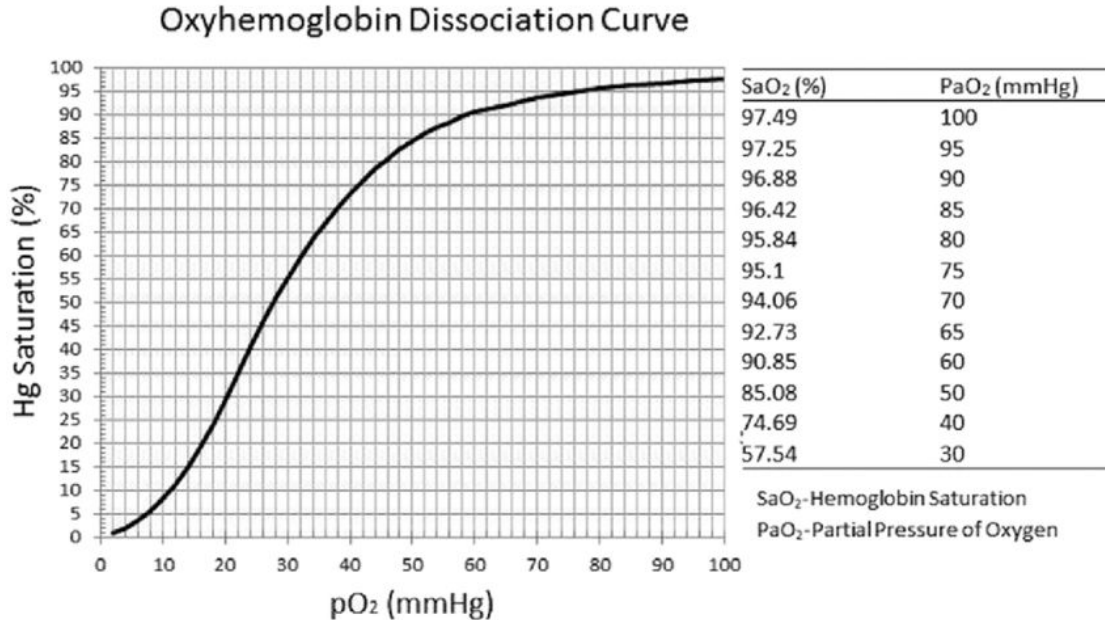
- Made of 4 Amino acids(peptides)chains
- Each chain have 4 heme group
- Heme group is porphyrin structure
- Contain Mg
- Center of Heme is Fe Ion
- O₂ binds to Fe
- Cooperative binding

Hemoglobin

- When muscle is active (contraction) it will produce CO₂ and it needs O₂
- Allosteric inhibition (Hemoglobin by Co₂ and H⁺)
- Acidity comes from carbonic acid
- Each RBC have 270 million Hemoglobin
- Loss of O₂ , RBC wil get into vein
- High Concentration of CO₂ in muscle cell diffuse into blood plasma , some goes into RBC
- In RBC there is Carbonic anhydrase

Hemoglobin

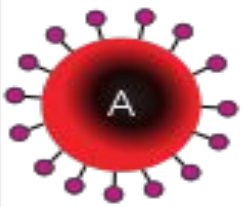
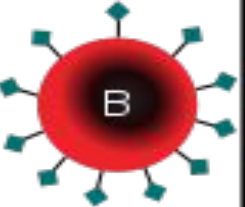
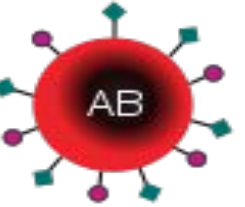
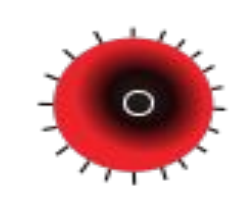


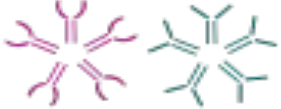



- Those H^+ inhibit the uptake of O_2 by hemoglobin.



Blood Types

- Blood antibody, is the part where will attack the different type.
- Blood Antigen, is the mark on RBC that define its type.
- Important in Blood transfusion
- Antigens are not protein , they are Glycolipids .

Blood types

	Group A	Group B	Group AB	Group O
Red blood cell type	 A	 B	 AB	 O
Antibodies in plasma	 Anti-B	 Anti-A	None	 Anti-A and Anti-B
Antigens in red blood cell	 A antigen	 B antigen	 A and B antigens	None

ANY QUESTIONS

WHAT QUESTIONS