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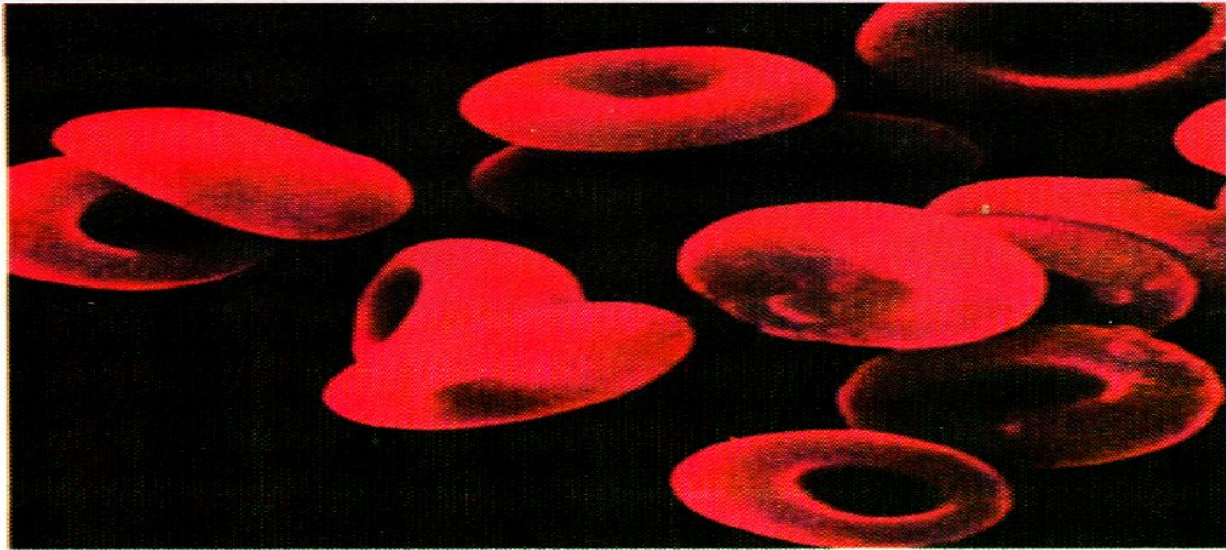
- M.D. PHYSIOLOGY

RED BLOOD CELLS (RBCs)

RED BLOOD CELL

A) NORMAL SHAPE –

- Circular, biconcave, non-nucleated.



NORMAL SIZE

- **Diameter – 7.2 μ**
(6.5 – 8.8 μ)
- **Thickness**
 - :- At the periphery - 2.2 μ**
 - :- At the centre - 1 μ**
- **Surface area - 140 μ m²**
- **Volume – 78 – 94 μ m³**
- **Life span – 120 days**
- **Site of destruction –**
 - Tissue macrophage system.**

Advantages of biconcave shape

- A) Because of the biconcavity – The RBC can squeeze itself in a capillary more easily.
- B) Biconcavity increases the surface area of the RBC.-So O₂ gets a bigger area for diffusion.
- C) Because of the biconcavity, the thickness in the centre is only 1 μ. So O₂ has to travel very small distance to reach the Hb.
- D) Minimal tension is offered on the membrane, when the volume of cell alters.

RBC IS A SIMPLE CELL

- RBC has :-

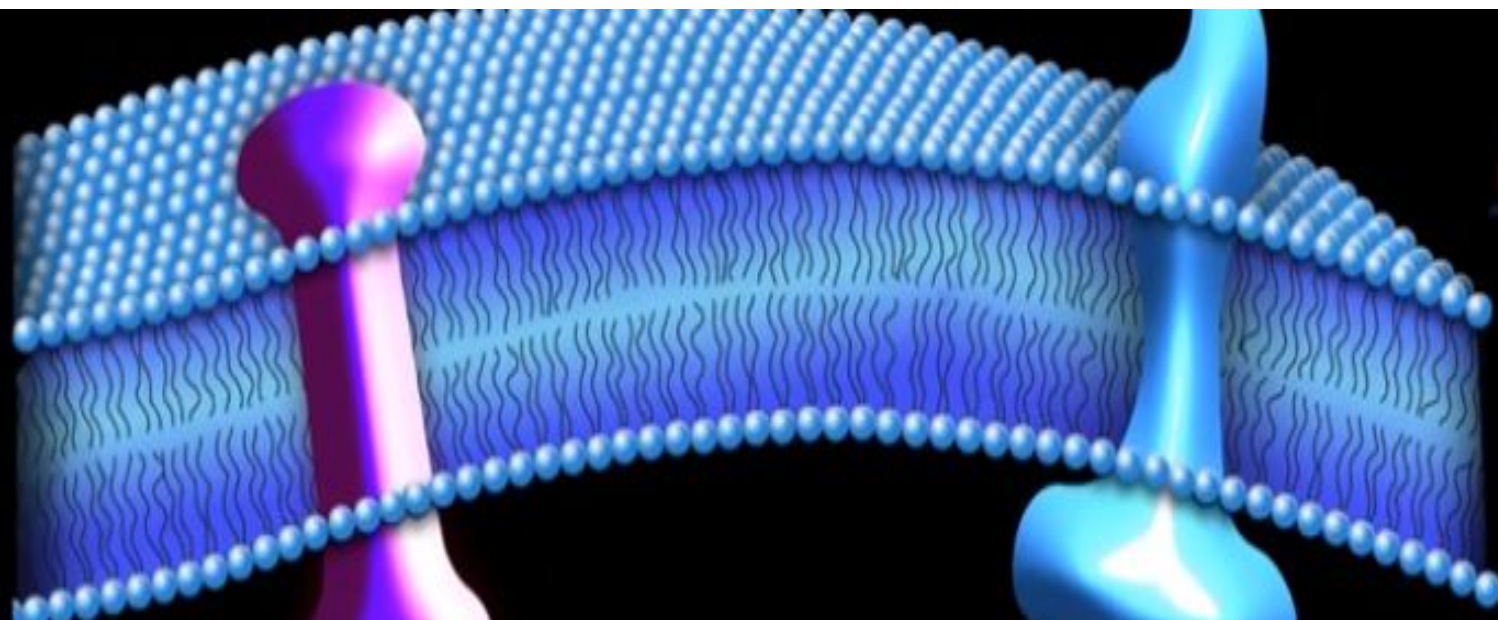
- No nucleus
- No mitochondria
- No ribosomes
- No golgiapparatus
- No endoplasmic reticulum

- Still it can live for 120 days & can carry out its normal functions. How ?

- Due to glucose, carbonic anhydrase, catalase.

RBC MEMBRANE

- Cell membrane contains lipids & proteins.
- **Five types of proteins are present**
 - 1) Spectrin
 - 2) Actin
 - 3) Ankyrin
 - 4) Glycophorin
 - 5) Band 3 protein



Band 3

Glycophorin A



Ankyrin

Actin

Spectrin



RBC Membrane proteins

5 types of proteins are present

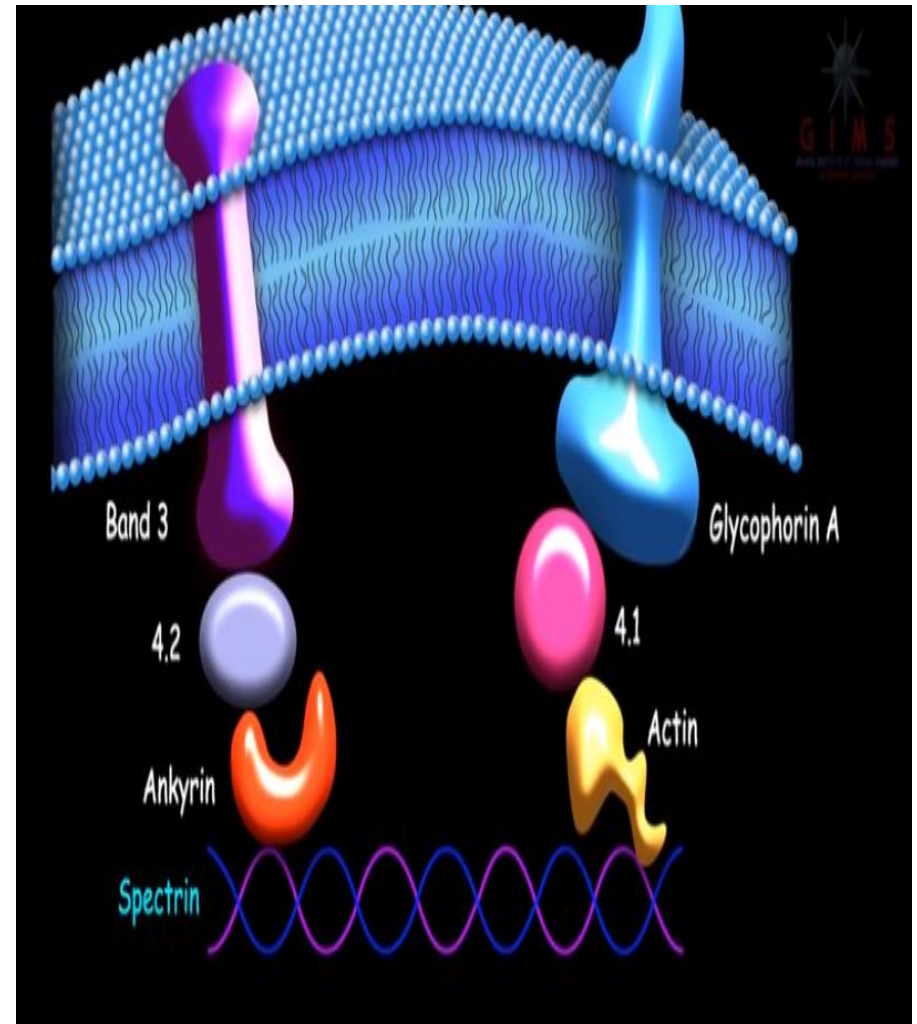
1) Spectrin

2) Actin

3) Ankyrin

4) Glycophorin

5) Band 3 protein



Hb is present in the centre of the RBC.

- **If it is not present in RBC & remains free in the plasma, then ?**

1) Increase viscosity – increase resistance to blood flow – increase blood pressure.

2) Increase osmotic pressure – interfere with the mechanism of fluid exchange at tissue level.

3) loss of free Hb in the urine – Hb uria

4) Free Hb Is destroyed by tissue macrophages.

FUNCTIONS OF RBC

- 1) Transport of O₂.**
- 2) Transport of CO₂.**
- 3) Hb acts as a buffer**
- 4) Determination of blood group.**