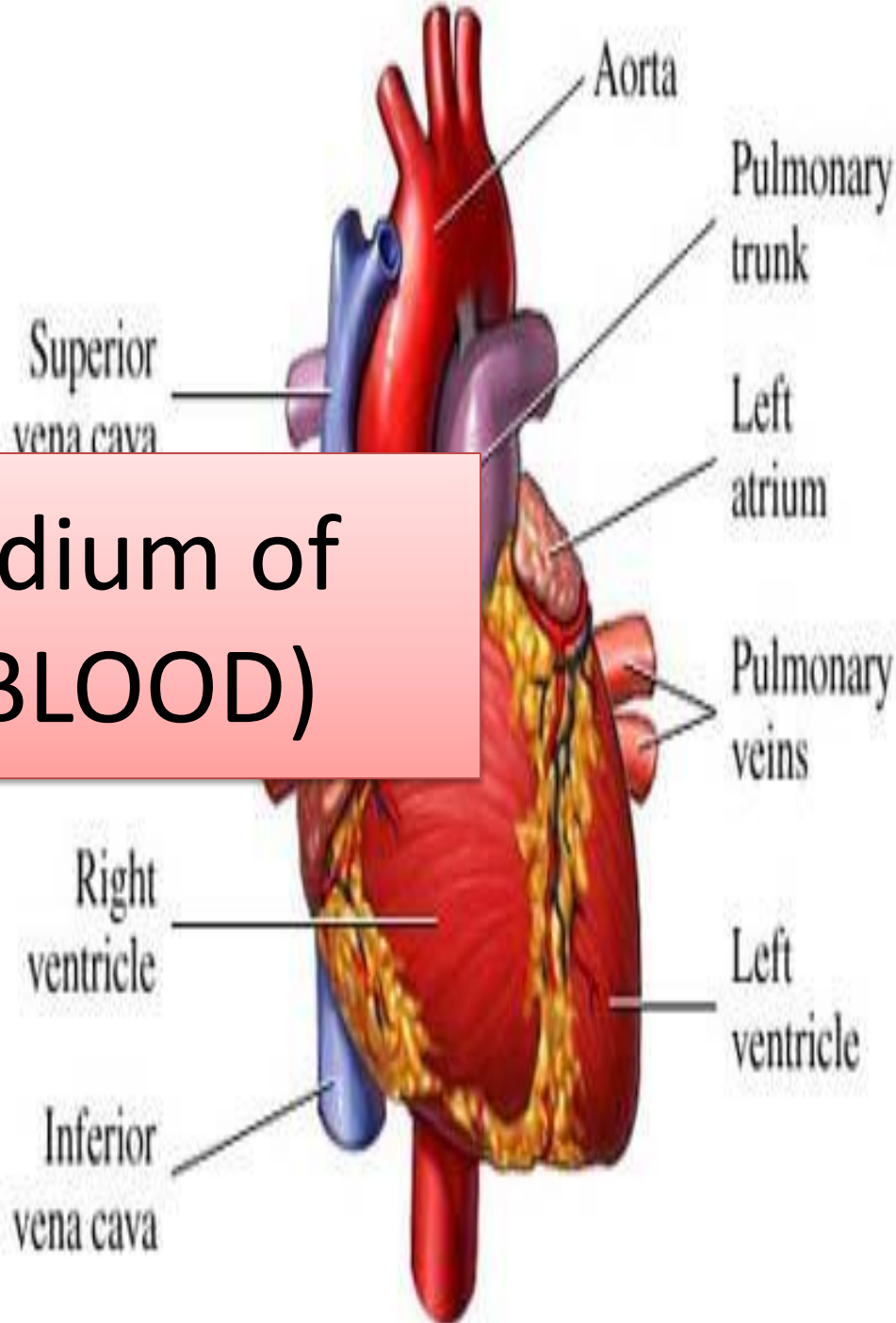
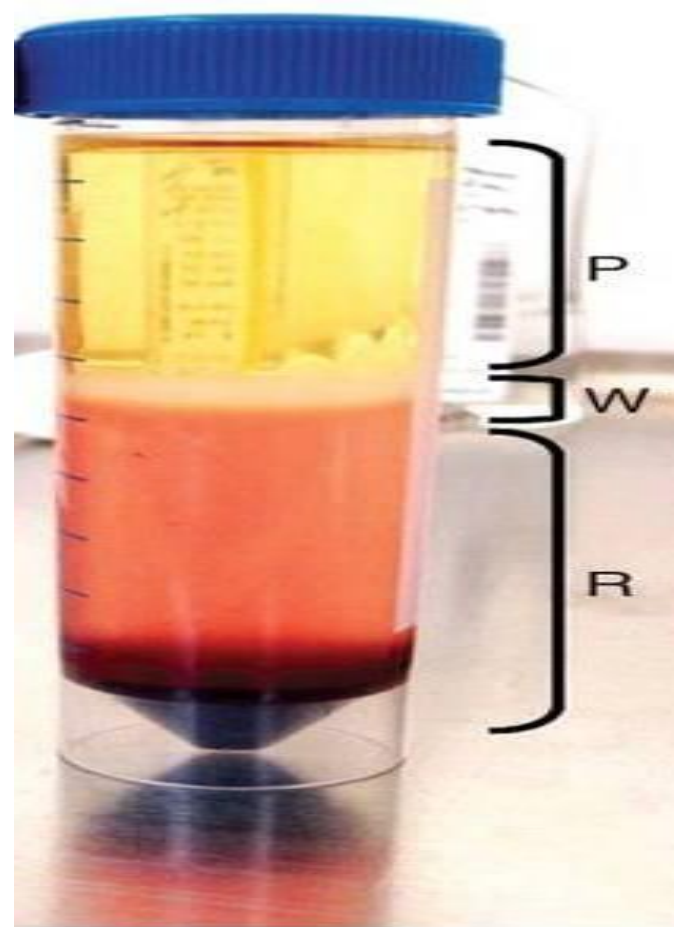
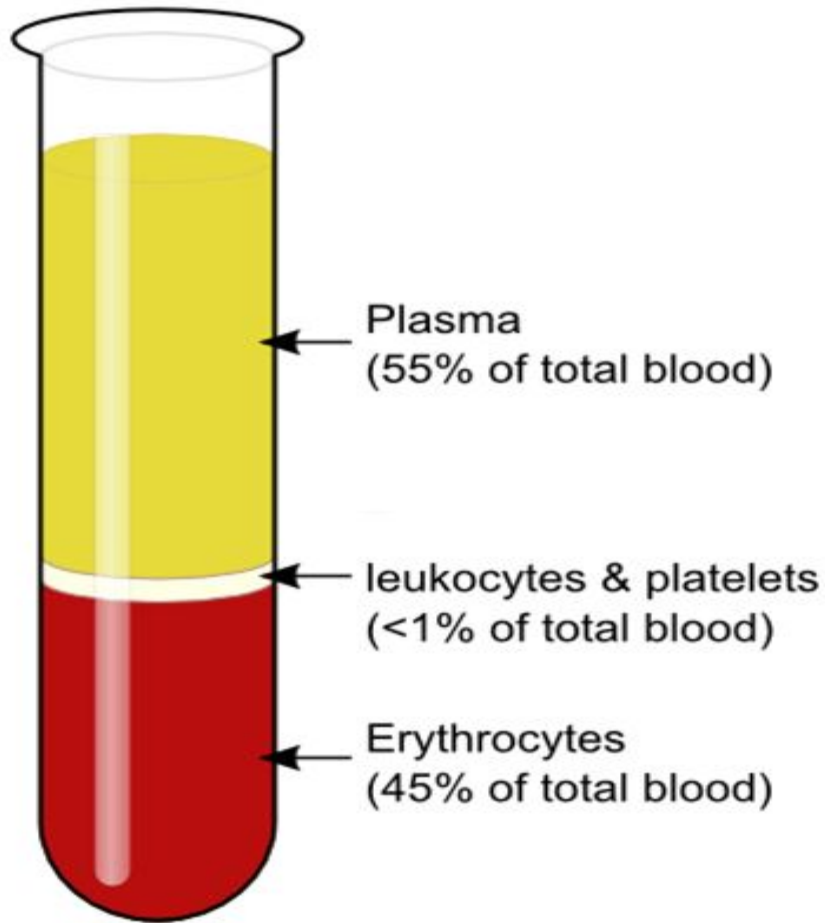


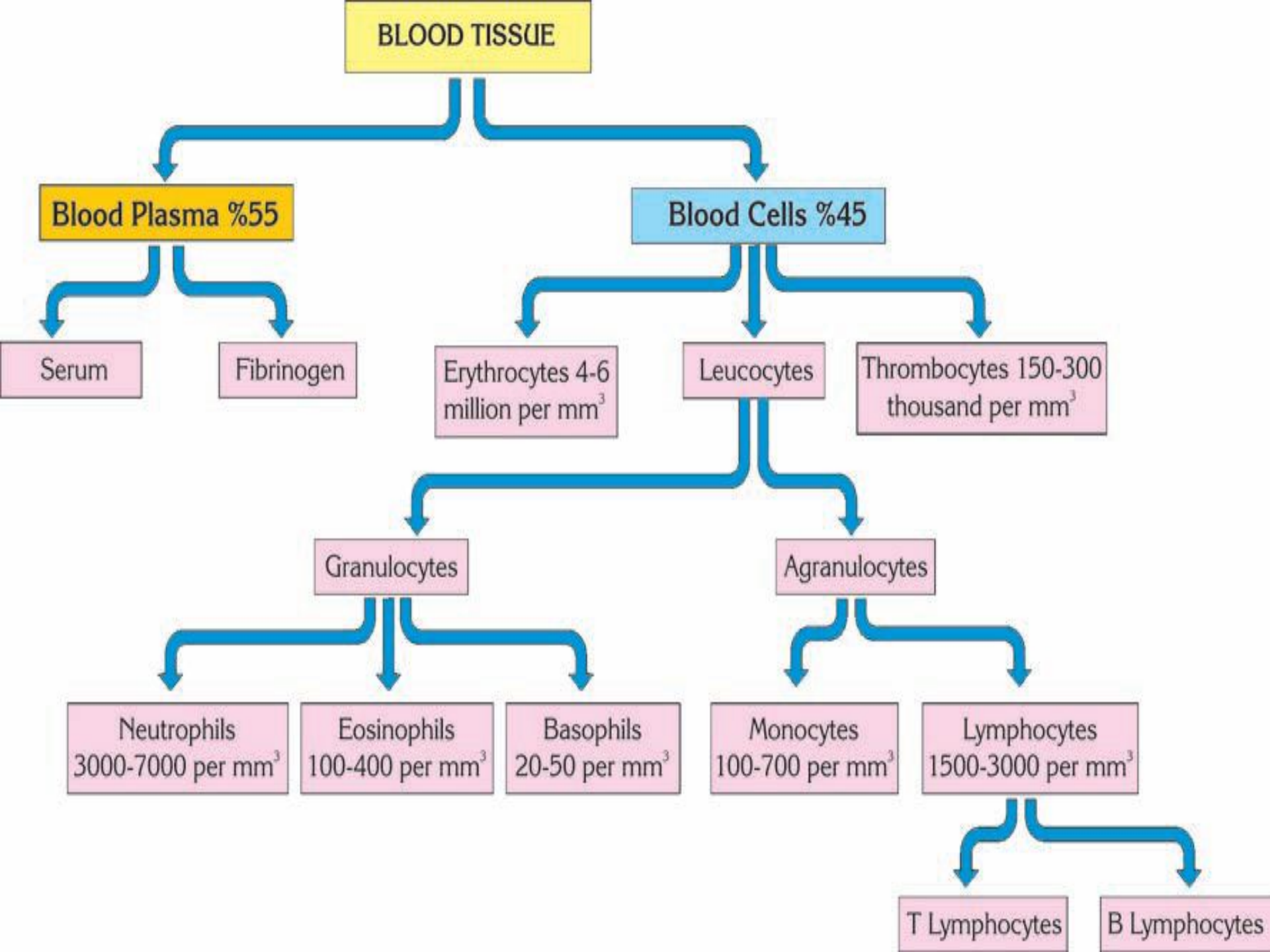
Internal medium of organism (BLOOD)





BLOOD

- Blood is a connective tissue
- It consists of 45% blood cells and 55% plasma



Red blood cells



Platelets



White blood cell

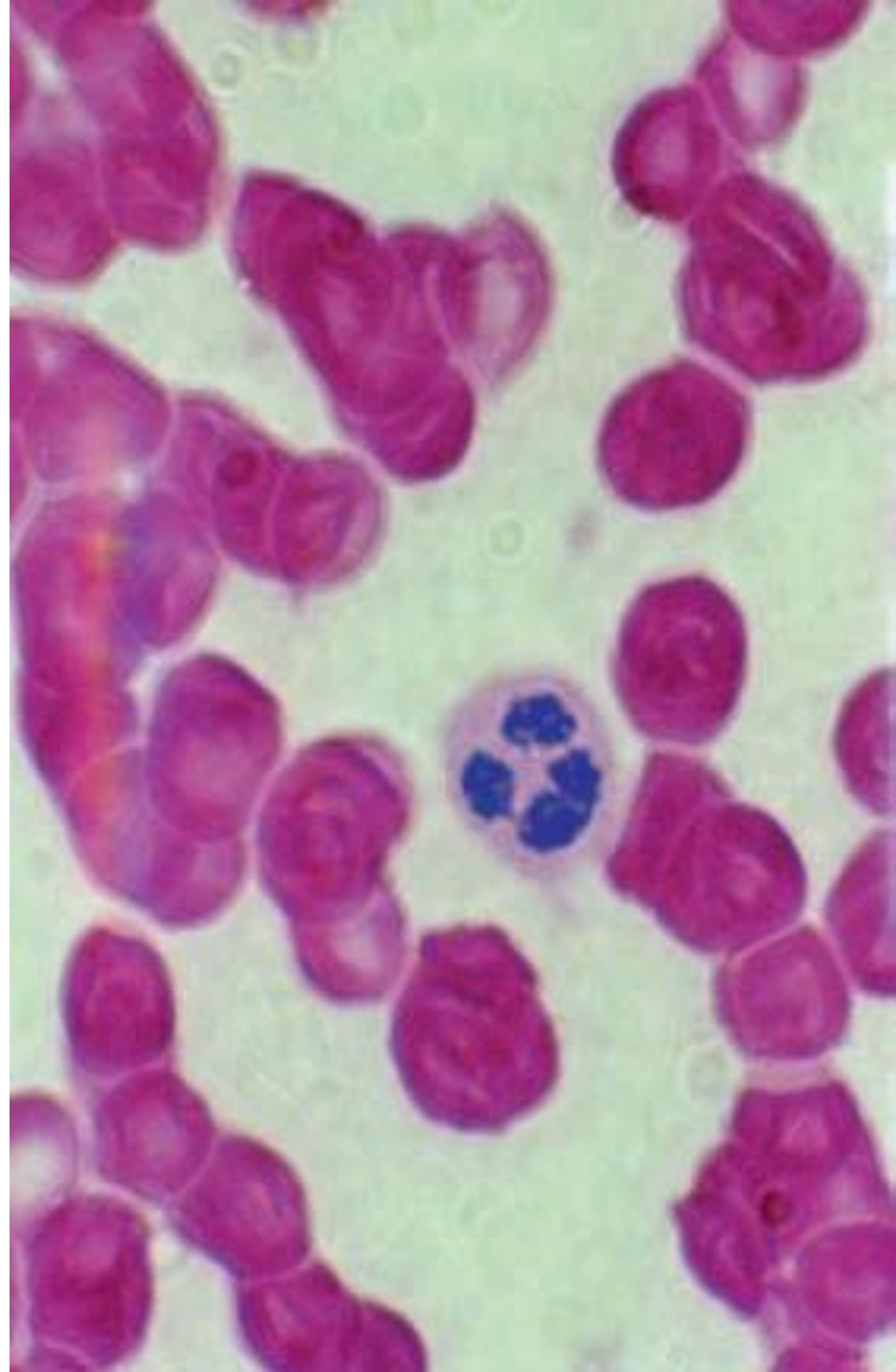


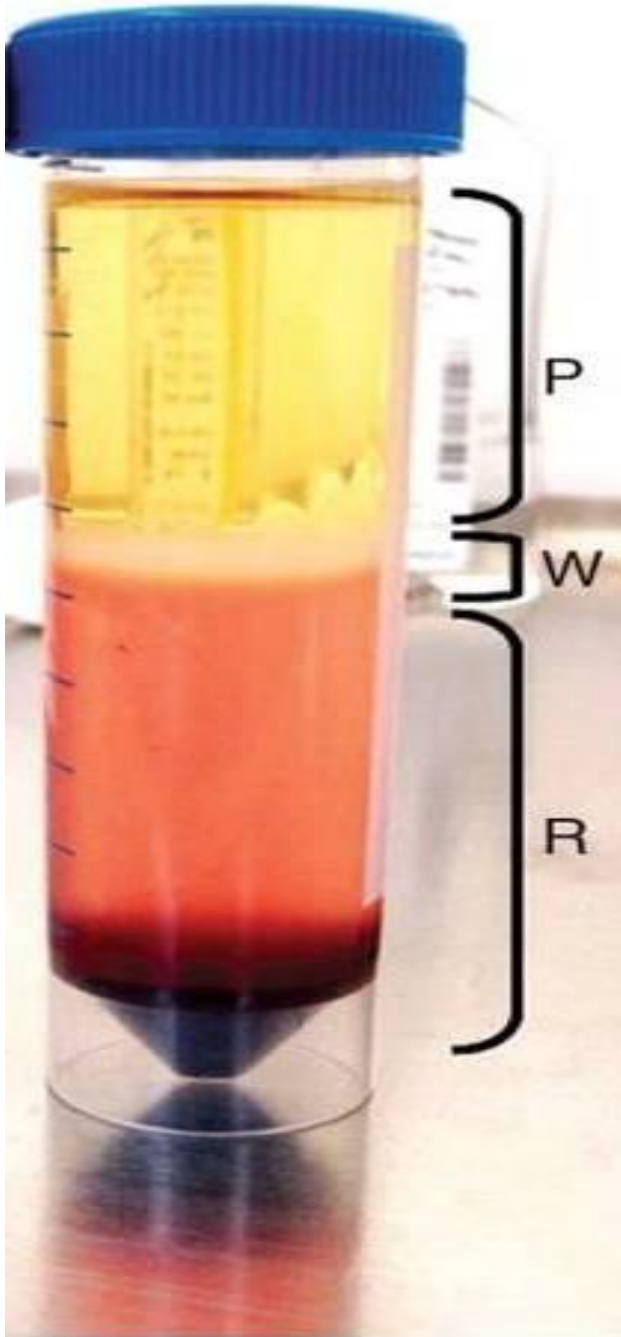
Plasma

Blood vessel

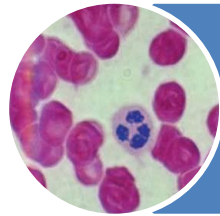
Functions of the Blood

- **Nutrient Transport**
- **Hormone Transport**
- **Homeostasis**
- **Immune response**
- **Clotting**

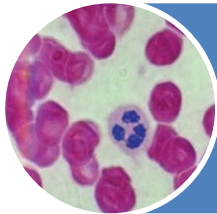




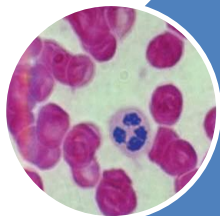
Plasma constitutes 55% of the blood



90-92 % is water



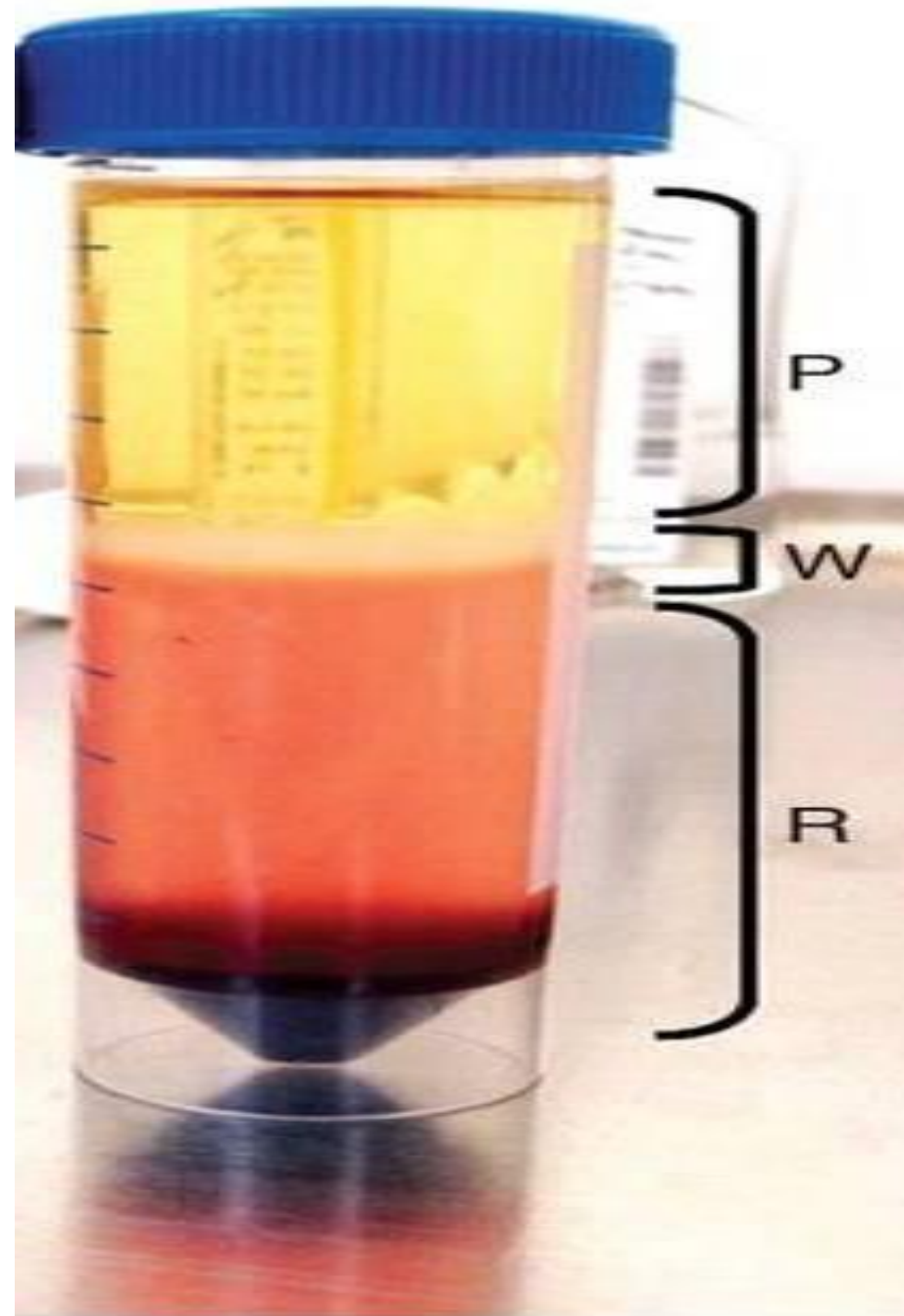
7-9% plasma proteins



the remaining 1% is amino acids, carbohydrates, lipids, hormones, urea, minerals and other substances

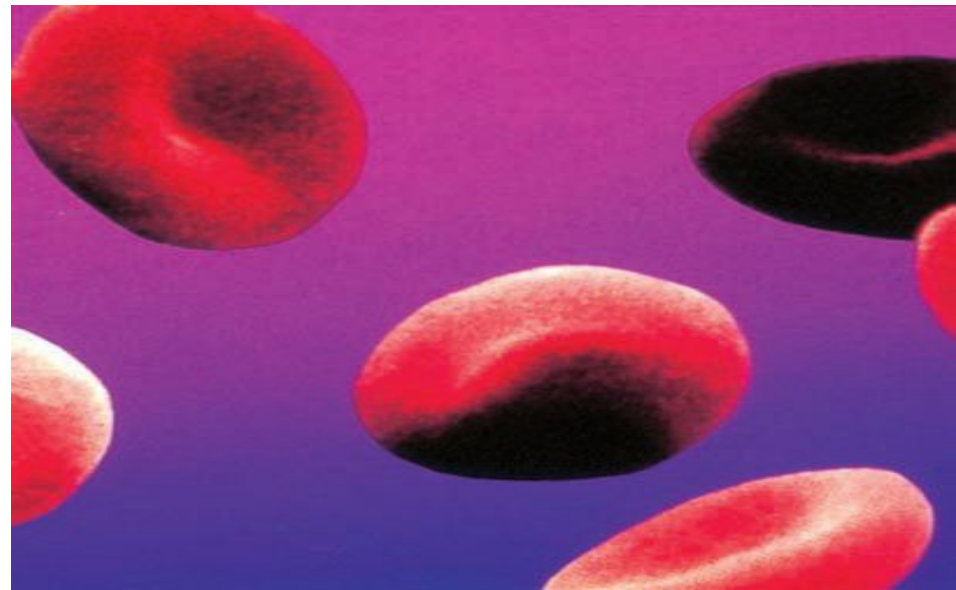
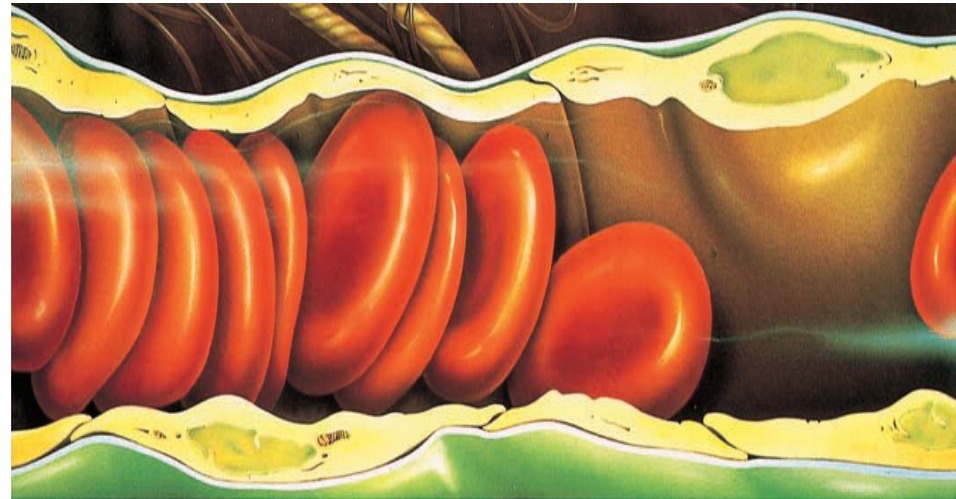
Plasma proteins

- There are more than 70 different types of plasma proteins
- Examples:
- **Fibrinogen** is involved in blood clotting
- **Albumin** regulates water level
- **Globulins** participate in the structure of antibodies and protects body from pathogens



Erythrocytes – red blood cells

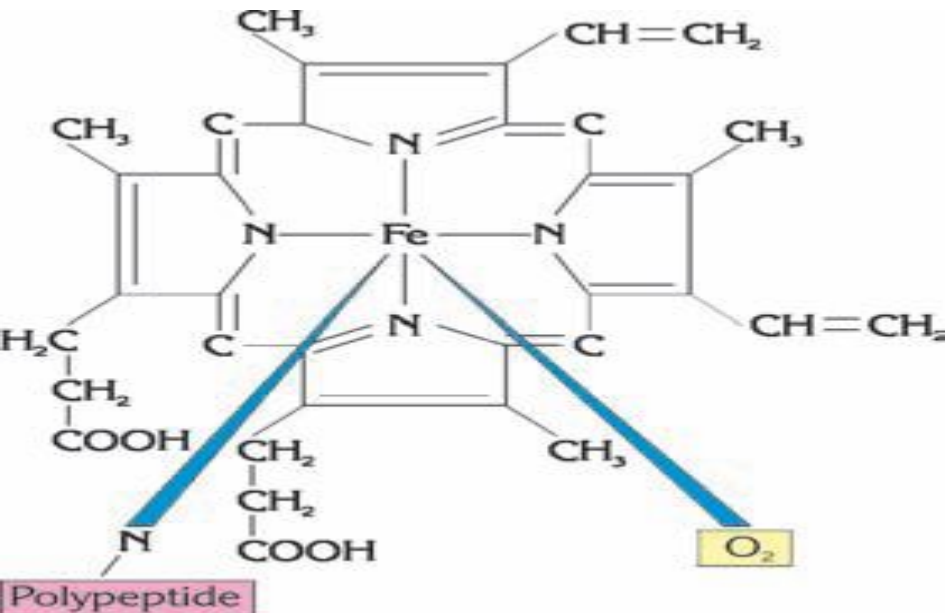
- There are approximately 4.5 to 5.5 million per mm^3 in the adults
- Mature erythrocytes in human lack a nucleus and disk shaped
- They have a protein which is called hemoglobin



Hemoglobin



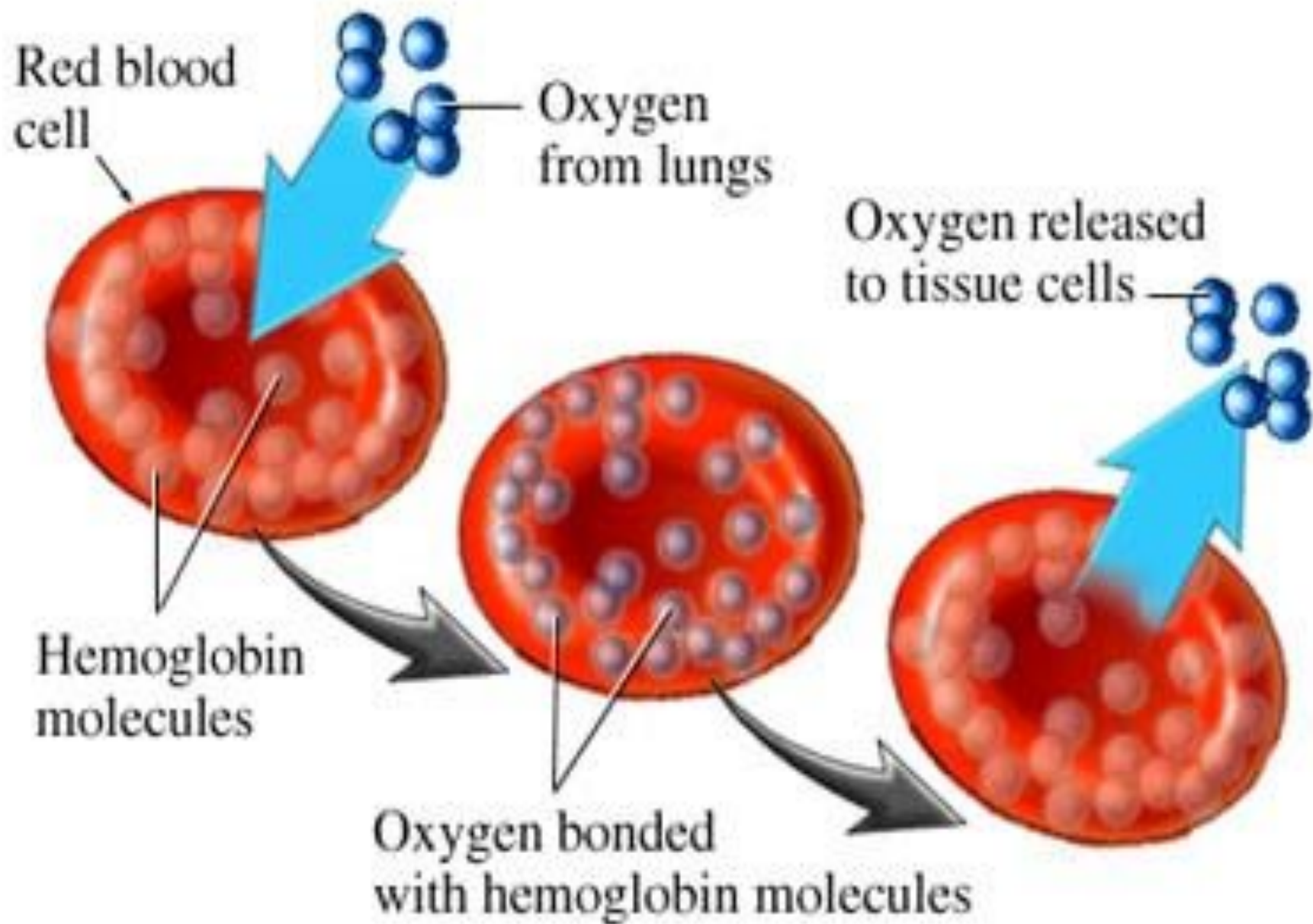
- It consists of
- A heme group
- A globin group
- The heme group is an iron containing complex, whereas the globin group is composed of proteins
- Oxygen molecules bind weakly to the iron of the heme group

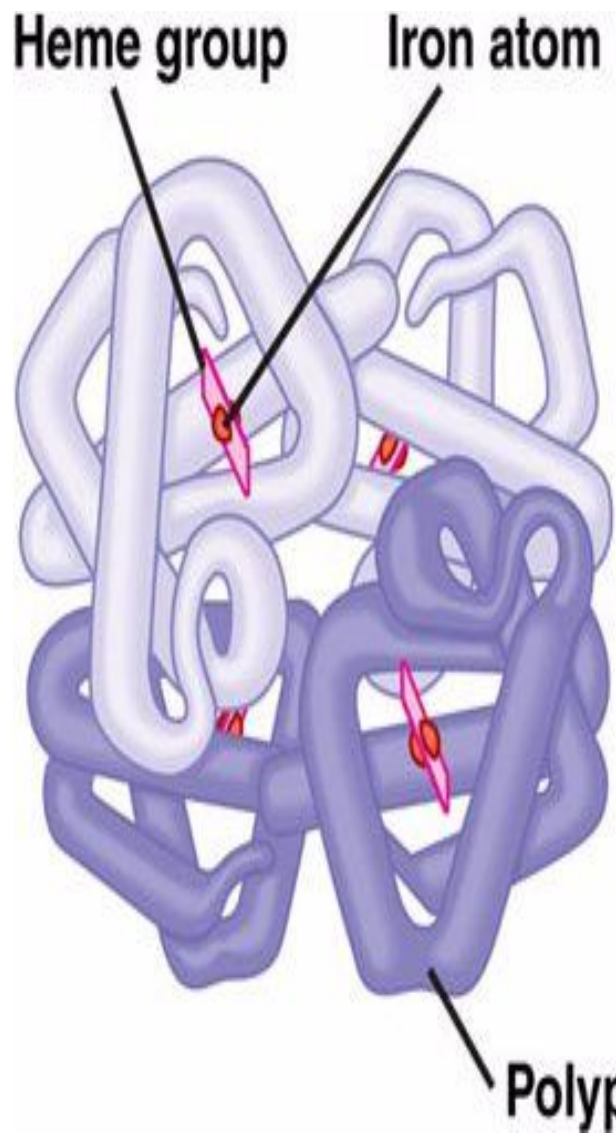


HEMOGLOBIN

- The transport of oxygen and carbon dioxide are carried out by hemoglobin



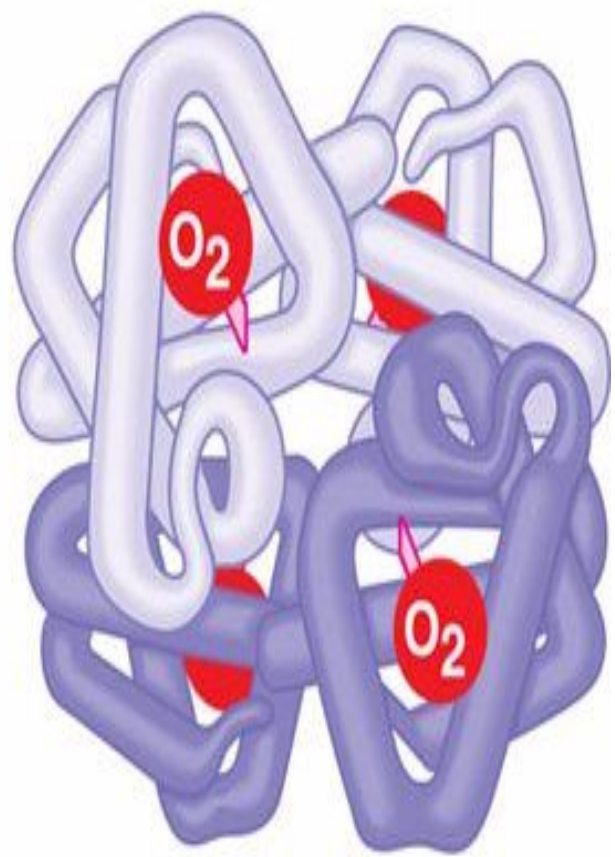




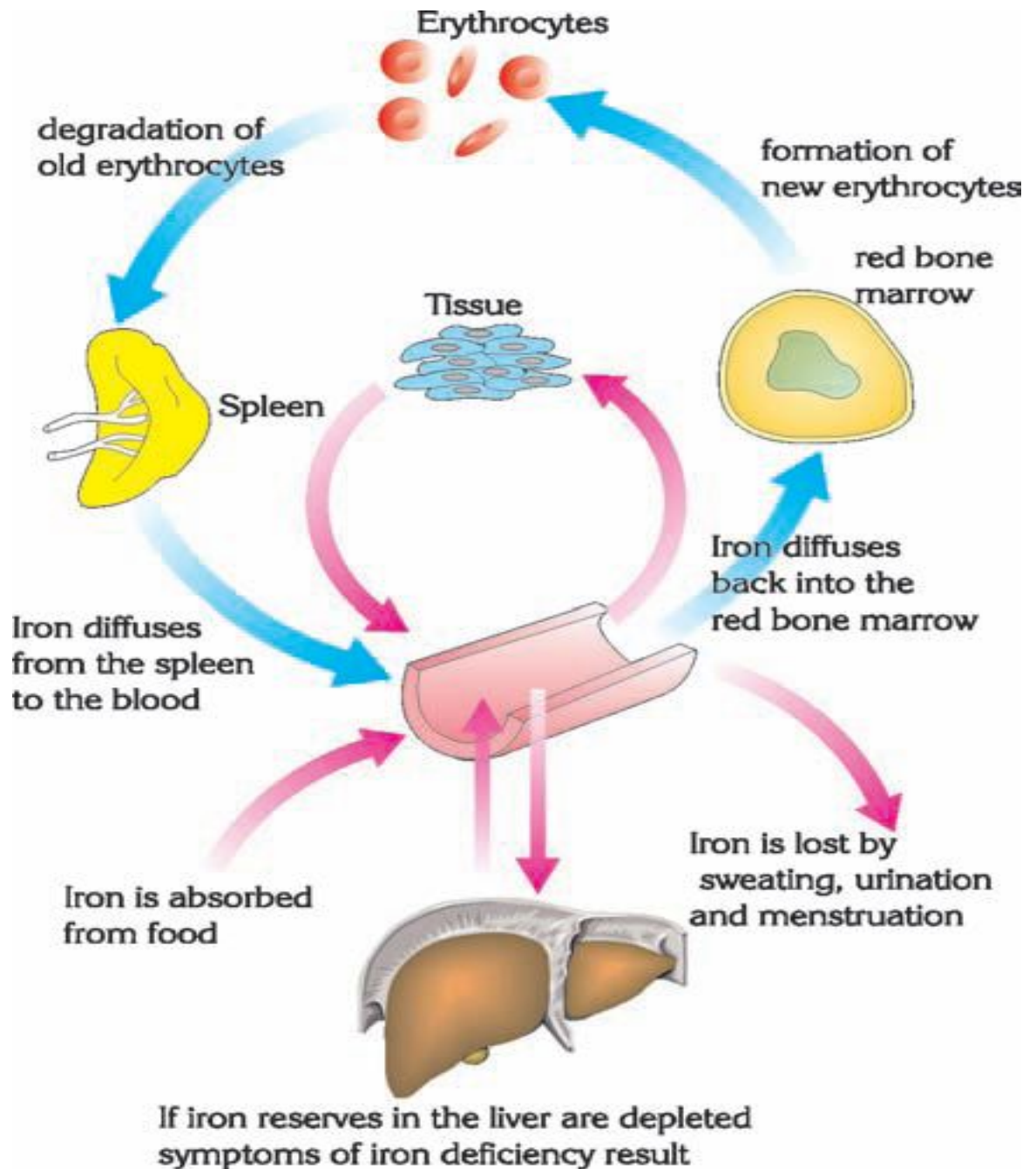
O₂ loaded
in lungs



O₂ unloaded
in tissues



- Erythrocytes are produced by the **red bone marrow**
- The most important vitamin in erythrocyte production is vitamin B₁₂
- Erythrocytes live for approximately 80-120 days in the circulatory system
- They are destroyed in **liver** and **spleen**

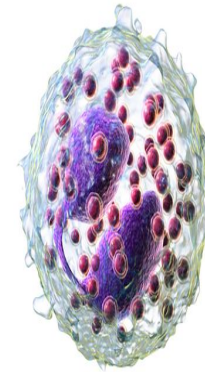


Leucocytes - White Blood Cells

- Leucocytes are nucleated, spherical, white cells
- The number of leucocytes in a healthy person is approximately 6-8 thousand per mm^3
- They are produced by *spleen* and *lymph nodes*
- Life span is about 2-4 days
- They have pseudopodia by which they move



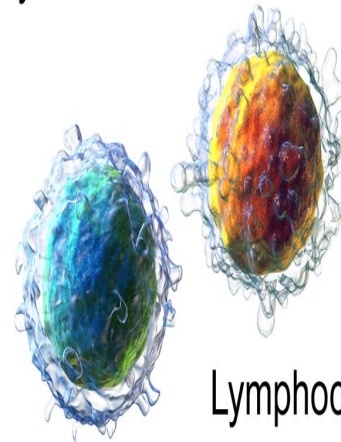
Monocyte



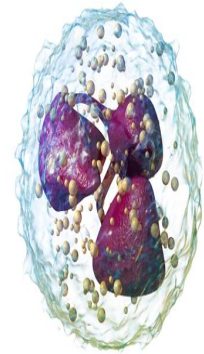
Eosinophil



Basophil

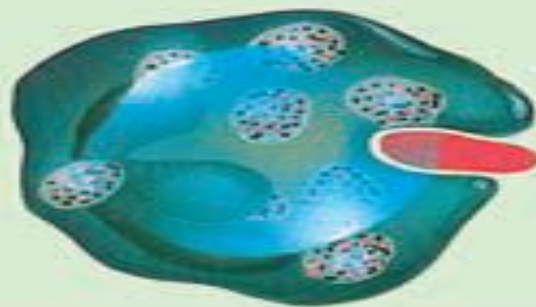
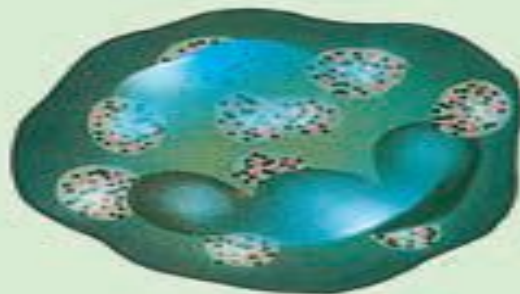
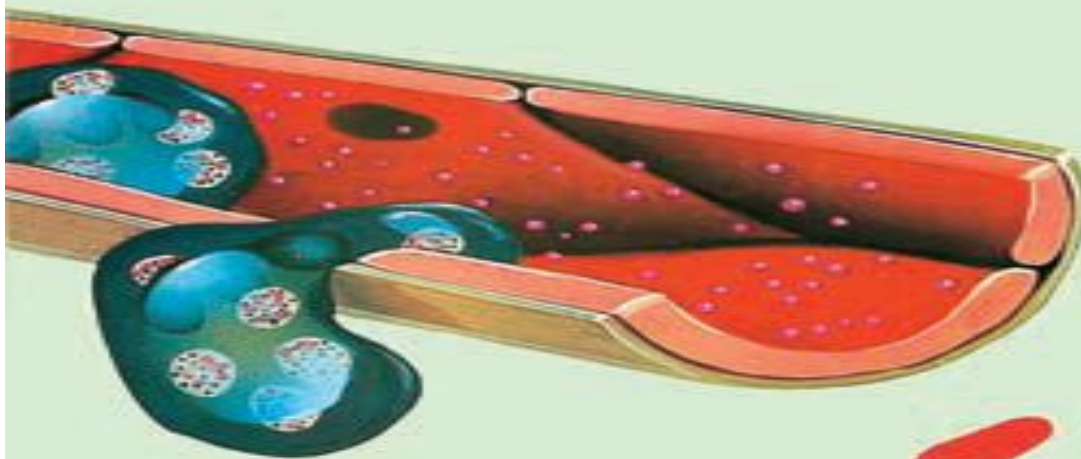


Lymphocytes



Neutrophil

White Blood Cells



Leucocytes phagocytose the bacteria

The phagocytosed bacteria are destroyed

Thrombocytes - Platelets



- Blood platelets, or thrombocytes, number approximately 250,000/mm³ of blood
- They are 2-4 μm in diameter, non-nucleated
- Thrombocytes are produced in the ***bone marrow***
- They are broken down in the ***lungs*** and ***spleen***
- Their life span is only approximately 8 days

Thrombocytes

- They play a vital role in preventing blood loss from the body and maintain homeostasis by **blood clotting**, thus helping to prevent the loss of large volumes of blood

