



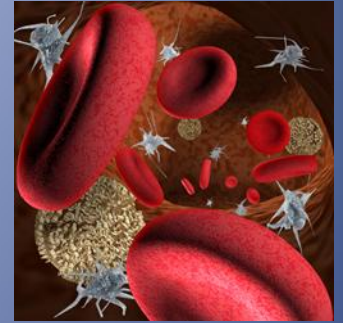
# The Structure and Function of Blood

By

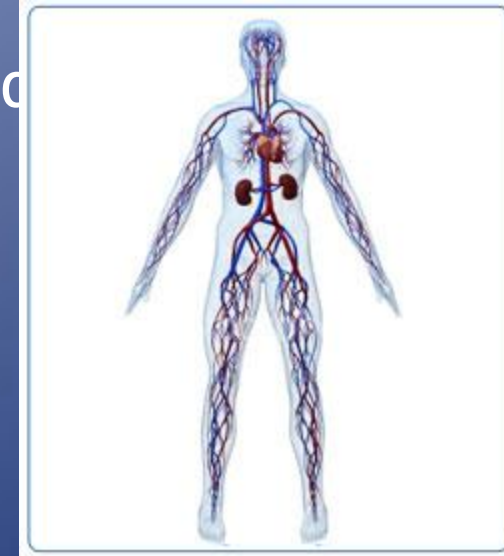
Khabiya P N

MES's College of Pharmacy, Sonai

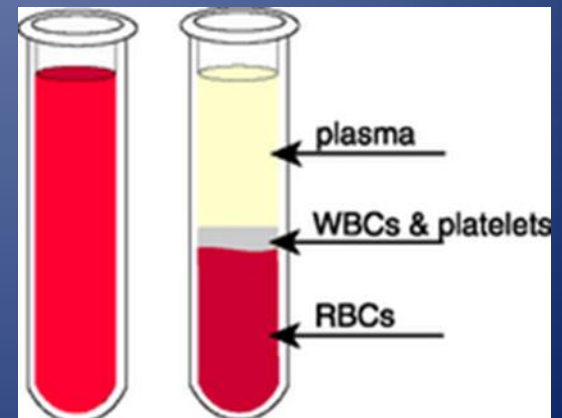
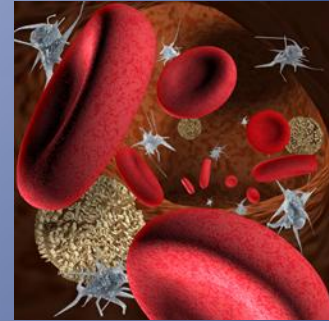
# Composition of Blood

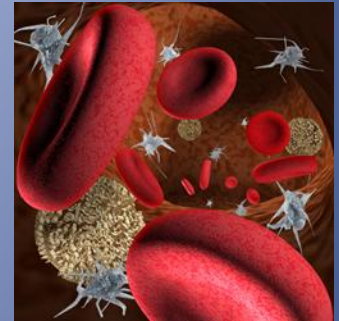


- Blood is responsible for.....
  - Transporting gases (oxygen & carbon dioxide)
  - Transporting waste products
  - Transporting nutrients
  - Helping remove toxins from the body



- Blood makes up 6–8% of our total body weight.
- Normal adult blood volume is 5 L.
- Blood is made up of cellular material in a fluid called plasma.

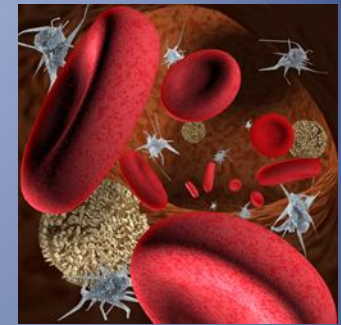




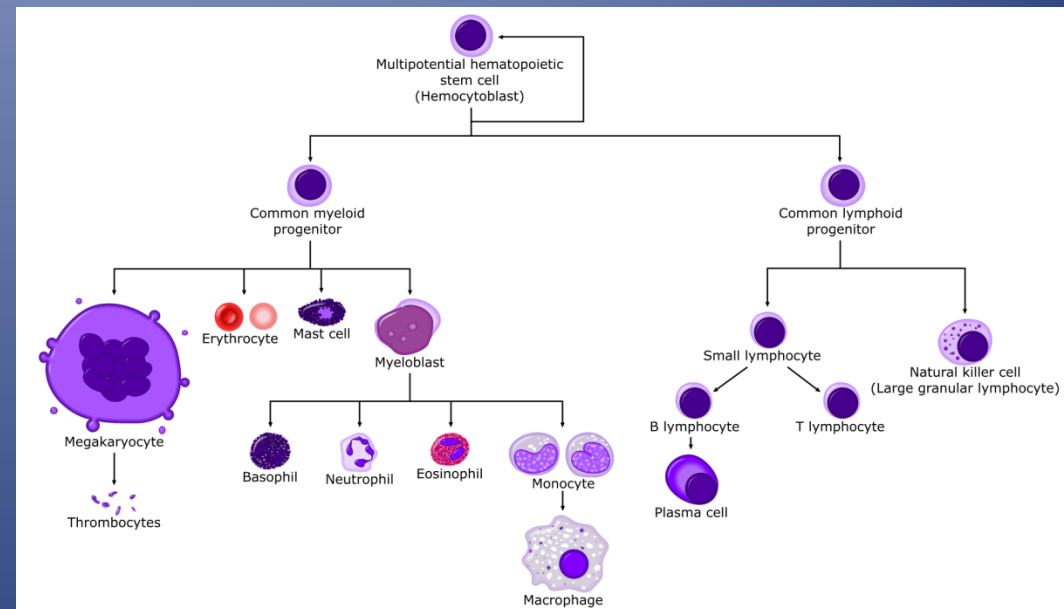
- Blood is a circulating tissue consisting of three types of cells.
  1. Red Blood Cells → Erythrocytes
  2. White Blood Cells → Leukocytes
  3. Platelets → Thrombocytes
- The cells listed above are suspended in a liquid known as plasma.



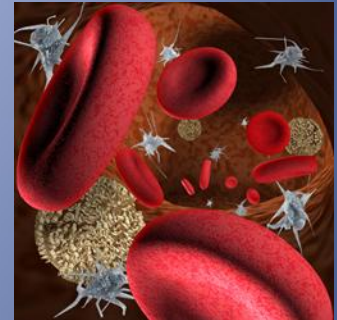
# Formation of Blood



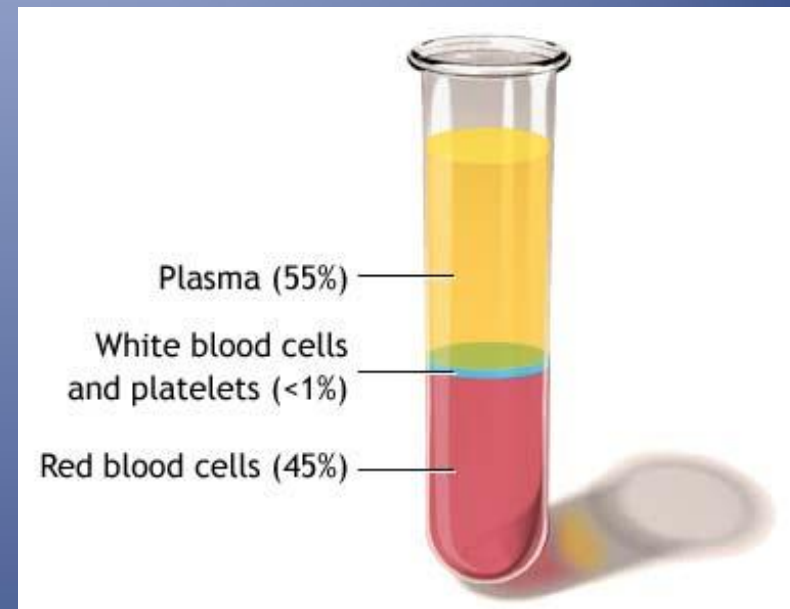
- Hematopoiesis → the formation and development of blood cells
- In adults the cellular elements are produced in the bone marrow.
- Some WBCs are produced in the lymphatic tissue and bone marrow.
- Blood cells need certain nutrients to form properly.
- Examples include.....
  - Iron
  - Folic acid
  - Vitamin B12
- All blood cells formed come from a hematopoietic stem cell.
- These cells can become any blood cell.



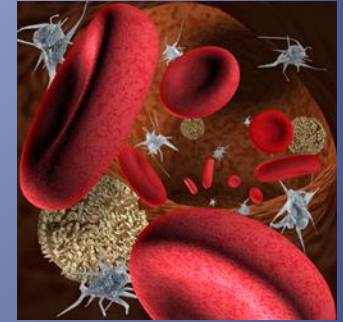
# Composition of Blood



- The blood is made up of cells that are suspended in liquid called plasma.
- Plasma makes up 55% of the blood.
- Plasma is made of 90% water and 10% proteins, lipids, carbohydrates, amino acids, antibodies, hormones, electrolytes, waste, salts, and ions
- Blood cells make up the remaining 45% of the blood.
- Red blood cells make up 99% of the blood cells.
- White blood cells and platelets make up the other 1%.



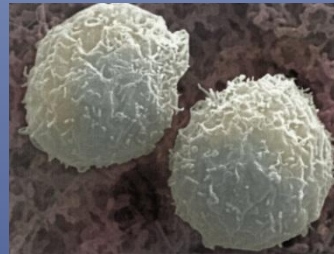
- Each type of blood cell performs a different function.



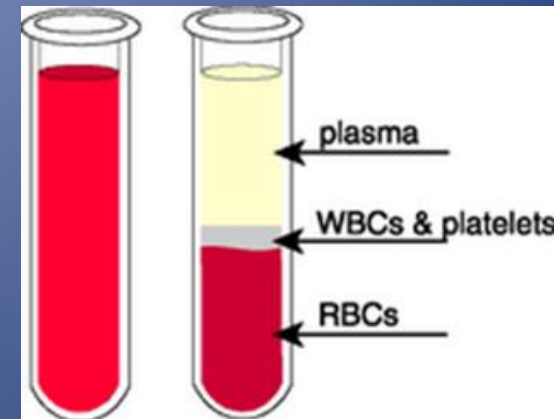
- Red blood cells (Erythrocytes)



- White blood cells (Leukocytes)



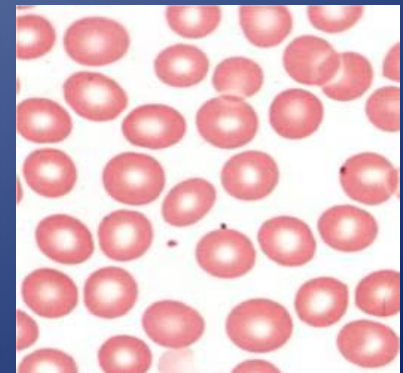
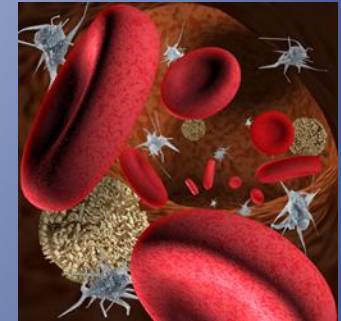
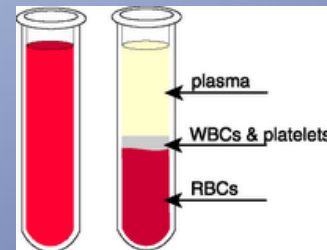
- Platelets (Thrombocytes)





# Red Blood Cells

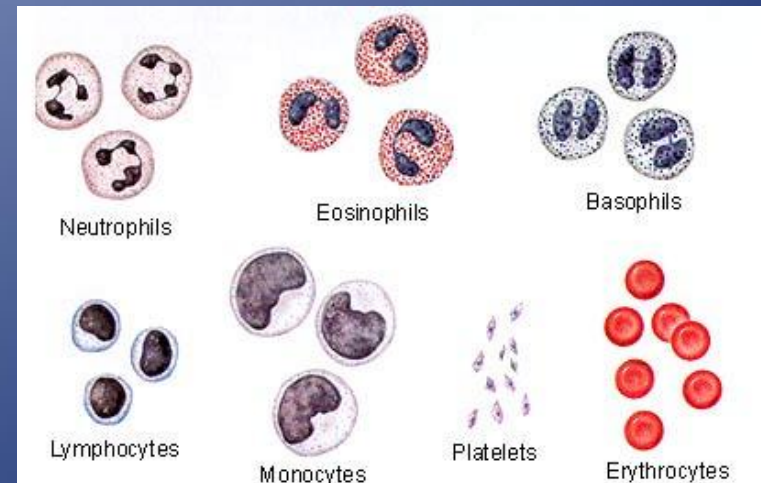
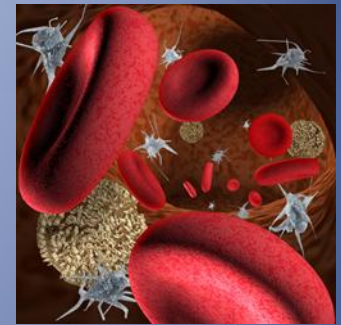
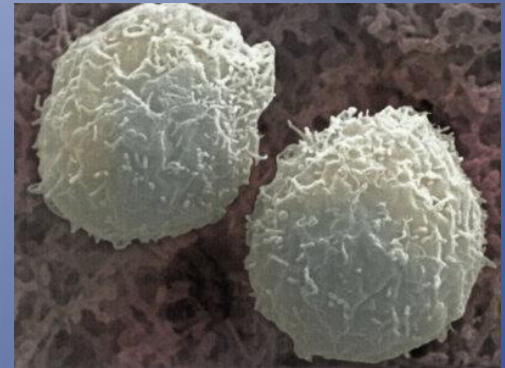
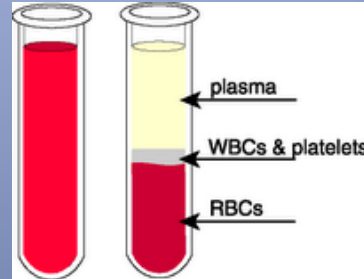
- Erythrocytes or RBCs
  - Most abundant cell in the blood  
(4 million – 6 million per microliter of blood)
  - Formed in the bone marrow
  - Mature forms do NOT have a nucleus
  - Shaped as biconcave disks
  - 6-8 micrometers in diameter
  - Life span of about 120 days
  - Hemoglobin (iron protein) is found in the RBC
  - Hemoglobin carries oxygen from the lungs to the rest of the body and carbon dioxide binds to the RBC and is taken to the lungs to be exhaled.





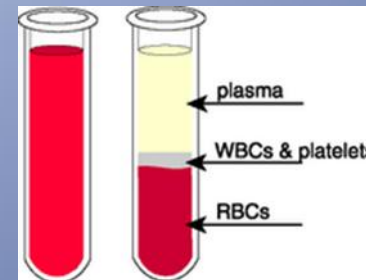
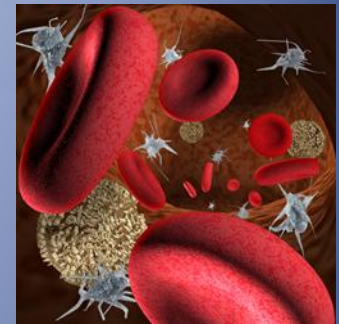
# White Blood Cells

- Leukocytes or WBCs
    - Largest sized blood cells
    - Lowest numbers in the blood (4,500 – 11,000 per microliter)
    - Formed in the bone marrow and some in lymph glands
    - Primary cells of the immune system
    - Fights disease and foreign invaders
    - Contain nuclei with DNA, the shape depends on type of cell
    - Certain WBCs produce antibodies
    - Life span is from 24 hours to several years
    - Size is 8-20 micrometers in diameter
    - There are five different types of WBCs
1. Neutrophils
  2. Eosinophils
  3. Basophils
  4. Lymphocytes
  5. Monocytes



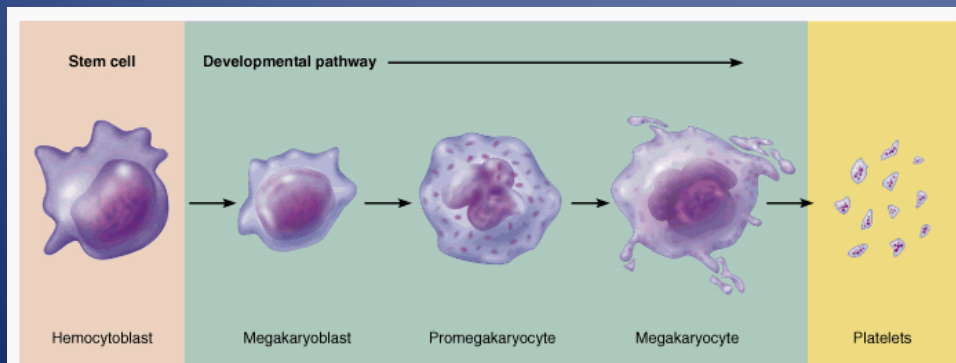
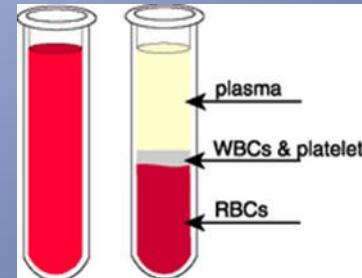
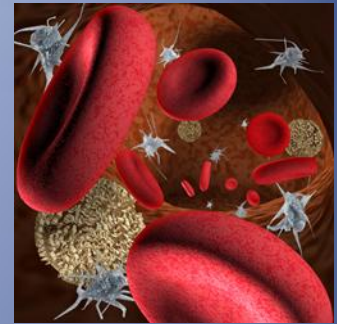
# Platelets

- Thrombocytes or PLTs
- Formed in the bone marrow
- Fragments from the cytoplasm of megakaryocytes
- Smallest of the blood cells
- 1-4 micrometers in diameter
- Shape can be round, oval, or appear spiky
- Life span of around 8-12 days



- Platelets

- Involved in the clotting process
- Seal wounds and prevent blood loss
- Help repair damaged vessels
- 150,000 – 400,000 per microliter of blood
- Platelets stain bluish with reddish or purple granules



Thank you