

BLOOD COMPOSITION AND ITS FUNCTIONS

72%



BLOOD COMPOSITION



- BLOOD: blood is the main circulating fluid in the human body.
- Study of blood is called HAEMATOLOGY.
- It is a fluid connective tissue derived from mesoderm.
- Bright red in colour, slightly alkaline(pH 7.4), salty, and heavier than water.
- The adult has 5lit of blood which constitute about 8% of the total body weight.

Blood is divided into two constituents,

1.cellular composition

2.non-cellular composition

Blood

Cellular composition

Non-cellular composition

Blood corpuscles

Plasma

RBCs

WBCs

platelets

Granulocyte

Agranulocyte

Neutrophil

Eosinophil

Basophil

Monocyte

Lymphocyte

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graph TD; A[Cellular composition] --- B[RBCs]; A --- C[WBCs]; A --- D[platelets]
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Cellular
composition

RBCs

WBCs

platelets

ERYTHROCYTE\RBCs:



- Erythrocytes are also called as red blood corpuscles.
- They are circular , biconcave , enucleated cells.
- Its size 7 micron metre in diameter to 2.5 micron metre in thickness.
- There are about 5.1 to 5.8 million RBCs per cu.mm in adult male and in adult female it is about 4.3 to 5.2 million.
- Average life span is of 120 days.

WBCs

Granulocytes

Agranulocytes

Neutrophil

Eosinophil

Basophil

Monocyte

Lymphocyte

Neutrophil



Eosinophil



Basophil



Monocyte



Lymphocyte



LEUCOCYTES\WBCs:



- Leucocytes are also known as white blood corpuscles .
- They are colourless , nucleated , amoeboid , and phagocytes cells.
- Due the amoeboidal movement they squeeze out of blood capillaries, this is called as **DIAPYCNOSIS**.
- It i of size 8 to 15 micron metre.
- They are about 5000 to 9000 WBCs per cu.mm
- The average life span is of 3 to 4 days.

Leucocytes are divided in two types on the basis of presence of granules are



Granulocytes

Neutrophil



Neutrophil

Eosinophil



Eosinophil

Basophil



Basophil

GRANULOCYTE

NEUTROPHIL

- Cytoplasmic granules are stained with neutral dyes.
- Nucleus is 3-5 lobed , hence are called polymorphonuclear.
- It constitutes about 54 to 62% of total WBCs .
- **Functions:** phagocytics and engulf micro-organisms.

EOSINOPHIL

- Cytoplasmic granules which are stained with acidic dyes such as eosin.
- Nucleus is bilobed constitutes 3% of total WBCs.
- **Functions:** They are non-phagocytic and increase during allergic reactions
- They show anti-histamine property.
- Increase in number of eosinophil is called as **EOSINOPHILIA**.

BASOPHIL

- Cytoplasmic granules, that stained with basic dyes such as methylene blue .
- Twisted nucleus.
- They constitute about 0.5% of total WBCs.
- **Functions :** they are non-phagocytic .
- They release heparin(anti-coagulant) and histamine also.

Agranulocyte

Lymphocyte



Lymphocyte

Monocyte



Monocyte

AGRANULOCYTE

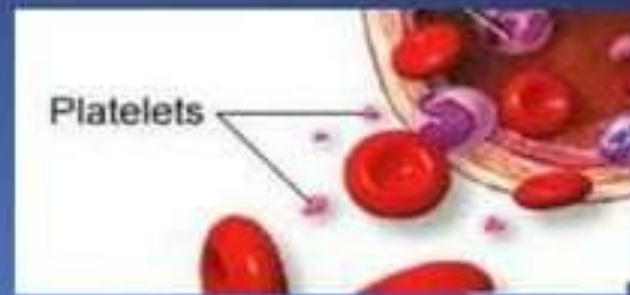
Lymphocyte :

- Large round nucleus .
- It constitute about 25 - 33% of total WBCs.
- **Functions** : it produces antibodies and responsible for immune response of the body.

Monocytes :

- Largest of all WBCs , kidney shaped nucleus .
- It constitute about 3- 9% of total WBCs.
- **Functions** : they are phagocytic in function, so they known as SCAVENGER.

PLATELETS :



- This are small fragments of bone marrow cells and therefore not really classified as cells themselves.
- **Functions** :
 1. secret vasoconstriction.
 2. form temporary platelet plug to stop bleeding.
 3. secret procoagulants to promotes blood clotting.
 4. dissolved blood clots.
 5. digest and destroy bacteria.
 6. secert some chemicals to attract neutrophil and monocyte to the site of inflammation.
 7. secret growth factor to maintain the lining of blood vessel.

Non – cellular
composition

Plasma

Plasma :



- It is straw coloured , slightly , alkaline , viscous fluid.
- It contains 90-92 % water , 10% of solutes and 7% of protein.
- Plasma proteins such as serum albumin , serum globulin , heparin , fibrinogen and prothrombin as a coagulating factors in the inactive form.
- Other nutrients such as glucose , amino acids, & glycerols.
- Nitrogenous waste as urea , uric acid , ammonia, and creatinine.
- Gases like oxygen, carbon-dioxide , nitrogen.
- Regulatory substances such as enzymes and hormones .
- Inorganic substances like bicarbonates , chlorides, phosphates, sulphates, Na, K, Ca & Mg ions, etc.

Functions of blood :

TRANSPORTATION :

- ❖ Respiration
- ❖ Nutrient carrier from GIT
- ❖ Transportation of hormones from endocrine glands
- ❖ Transportation of metabolic waste.

REGULATION :

- ❖ Regulates pH
- ❖ Adjusts and maintain body temperature
- ❖ Maintains water contents of cells

❖ PROTECTION :

- ❖ WBCs protects against disease by phagocytosis
- ❖ Reservoir for substances like water, electrolytes.
- ❖ Performs haemostasis.

- Any Questions??????????



THANK YOU.....