



# Sports & Physical Education

## Circulatory System

Human Blood



# Human Blood

- Fluid **Connective tissue**
- P.H- **7.4** (Alkaline)
- Arteries blood colour -Red ( $O_2$ )
- Veins blood colour- blue ( $CO_2$ )



# Function Of Blood-

- Transporting oxygen and nutrients to the lungs and tissues
- Forming blood clots to prevent excess blood loss
- Carrying cells and antibodies that fight infection
- Bringing waste products to the kidneys and liver, which filter and clean the blood.
- Regulating body temperature



# Blood

**Plasma(55%)**

**Water(90%)+other(10%)**

- **Protein- 8%**
- **Salt- 0.9%**
- **Nutrition Material- 0.1%**
- **Organic Waste Material**

**Blood Cell (45%)**

**RBC**

**WBC**

**Platelets**



# Blood Plasma

Water(90%), Protein- 8% ,Salt- 0.9% , Nutrition Material- 0.1%,  
Organic Waste Material

- **Protein- 8 %**

- Albumin

- Globulin

- Fibrinogen

- Prothrombin

Blood Clotting

- **Salt- 0.9%**

- Sodium Chloride

- Sodium Bicarbonate

- Salt of Calcium

- Iodine

- Phosphorus

- Magnesium

- Iron etc....

# Blood Plasma



- **Nutrition Material – 0.1%**
  - Carbohydrate- **Glucose**
  - Protein- **Amino Acid**
  - Fat- **Fatty Acid**
  
- **Organic Waste Material –**
  - Urea
  - Uric Acid
  - Creatinine
  - Ammonia
  - Oxygen
  - Carbon dioxide
  - Enzymes
  - Antigens



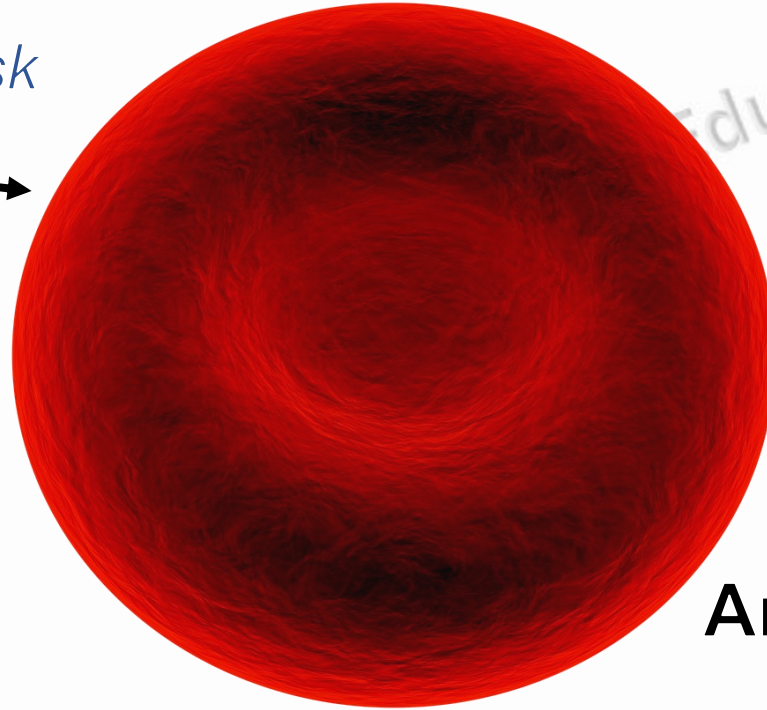
# Blood Cell

RBC, WBC, Platelets

- **RBC(Red Blood Cell)- Erythrocytes**

During **embryonic stages**, red blood cells are produced in the **liver and spleen**.

*Bi-Concave Disk*  
**Circular** →  
**Diameter**  
*7-8 micrometer*



**Formation- Bone Marrow  
& Liver**

**Life- 120 Days**

**Death- Spleen** (*Graveyard of RBC*)  
(*Blood Bank of Body*)  
(*Blood storage-Spleen*)

**Anucleate - Without Nucleus**

*Except- Camel, Llamas*

A **drop of blood** contains approximately **4-5 million** red blood cells



# Erythrocytes

**RBC**



**Haemoglobin (Hb)**

**Erythropoiesis**- The process of forming new RBC  
Deficiency of RBC- **Erythrocytopenia** (Anemia)

100ml blood- 15ml Hb

Male-14-17%

Female-13-15%



Red blood  
cells are red  
because of  
**the heme**

**Haem  
(Iron)**

**Globin  
(Protein)**

Transportation  
of  $O_2$ ,  $CO_2$

The main function of Hb is to carry and  
transport oxygen to various tissues.



# Blood Cell

- **WBC(White Blood Cell)- Leucocytes**

**Diameter**

*19-20 micrometer*

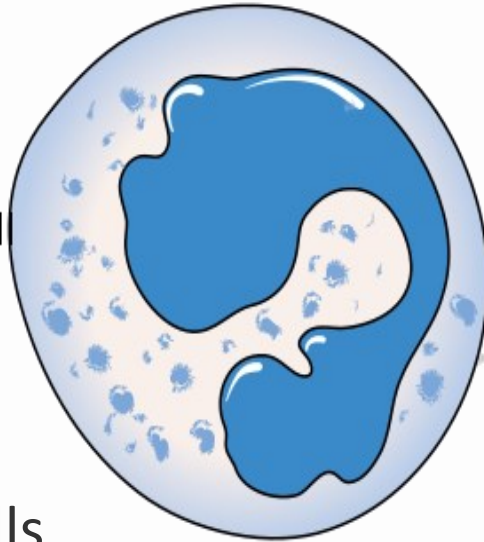
**Leucopoiesis**- The process of forming new WBC

**Leukocytosis**- WBC is above the normal range

**Leukocytopenia**- Deficiency of WBC-

**with a nucleus.**

White blood cell  
(leucocyte)



**Irregular** &  
**colorless** cells

**Formation-** Bone Marrow, *Lymph Node, Spleen, Tonsil etc.*

**Life-** 3-5 day

**Death-** lymphatic system

A **drop of blood** contains approximately **6-10 thousand** white blood cells

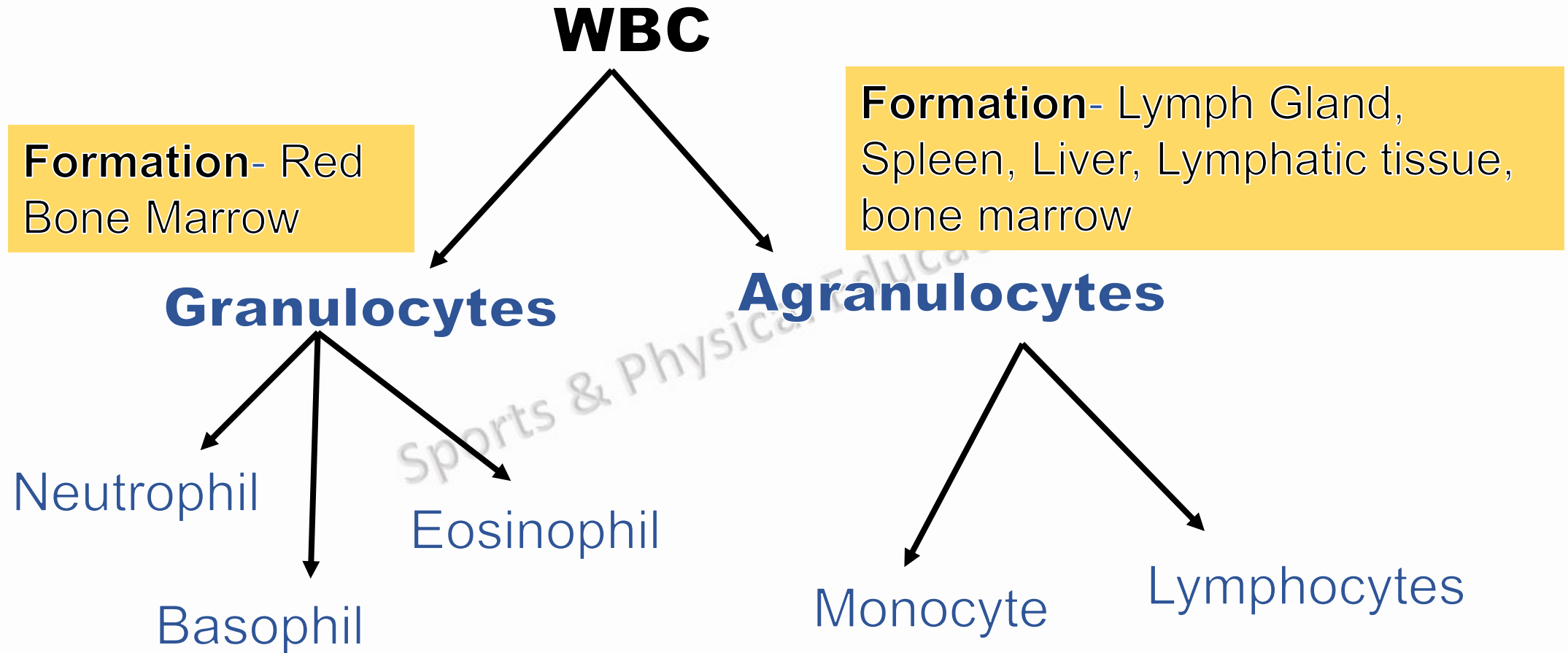
**Function-**

WBC are cells of the immune system.

They help the body fight infection and other diseases.



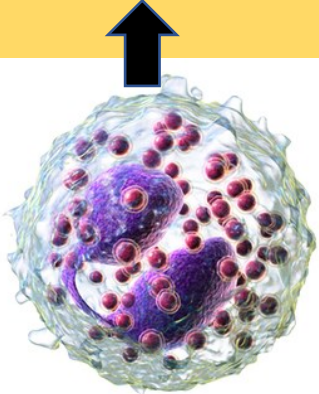
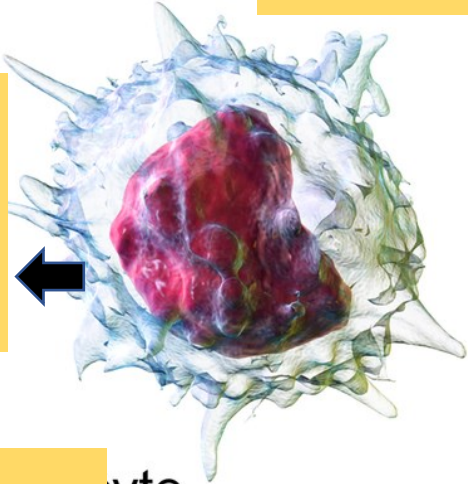
# Classification



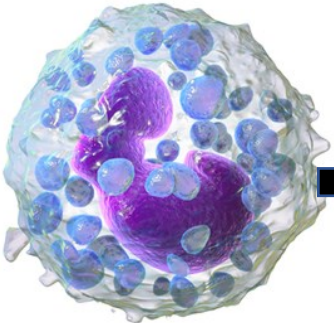


**2.3%**  
**Destroying foreign substances-** Parasitic Infection , Allergic reaction.  
**Regulating inflammation-** Isolating and controlling a disease site.

**5.3%**  
 Police man of the blood.  
 Bacterial infection  
**Phagocytosis Activity**



Eosinophil

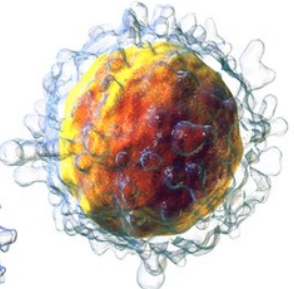
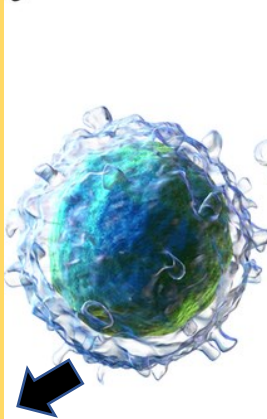


Basophil

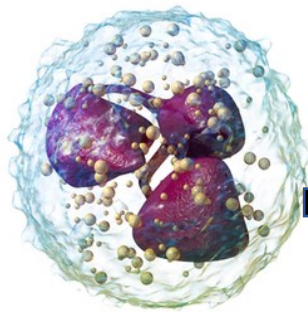
**0.4%**  
**Heparin-** Preventing blood clotting  
**Histamine-** Protect body during an allergic reaction

**30%**  
**T lymphocytes (T cells):** T cells control your body's immune system response and directly attack and kill infected cells and tumor cells.  
**B lymphocytes (B cells):** B cells make antibodies. Antibodies are proteins that target viruses, bacteria and other foreign invaders.

cyte



Lymphocytes



Neutrophil

**60-65%**  
 Prevent bacterial infection

**White Blood Cells**

# ▪ Blood Platelets- **Thrombocytes**

Formation- Bone Marrow

Life- 10-12 Days

Death- Spleen

## Function-

**Blood Clotting-**

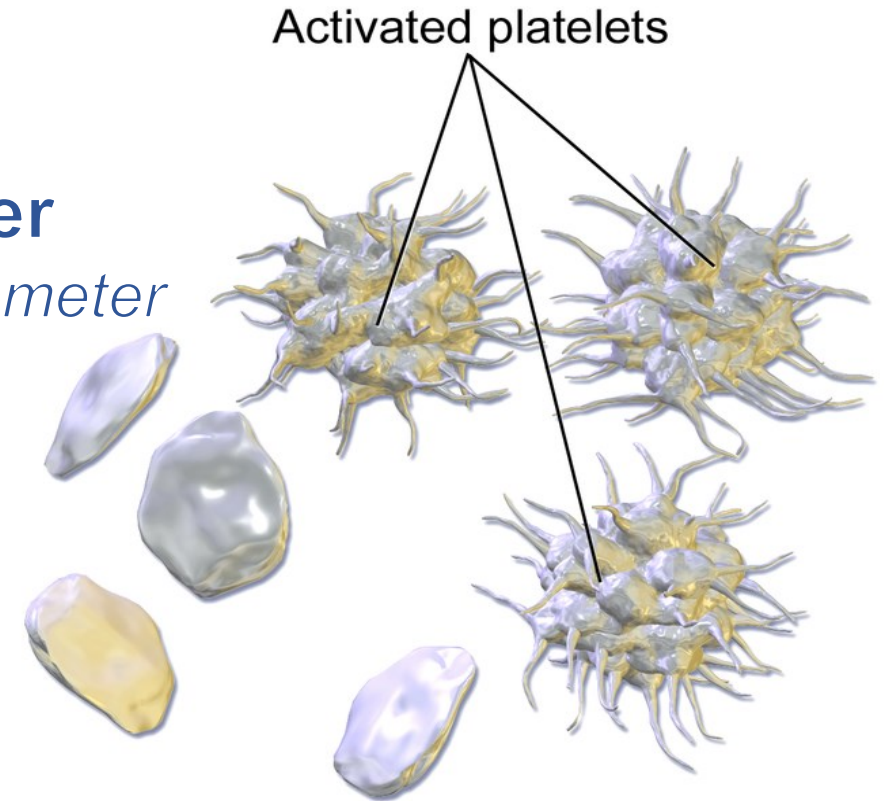
↓  
2 Protein

↙  
*Fibrinogen*

↘  
*Prothrombin*

**Diameter**

*2-3 micrometer*



A drop of blood contains approximately 2.5-5 lakh blood platelets.



# Thank You for Watching



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