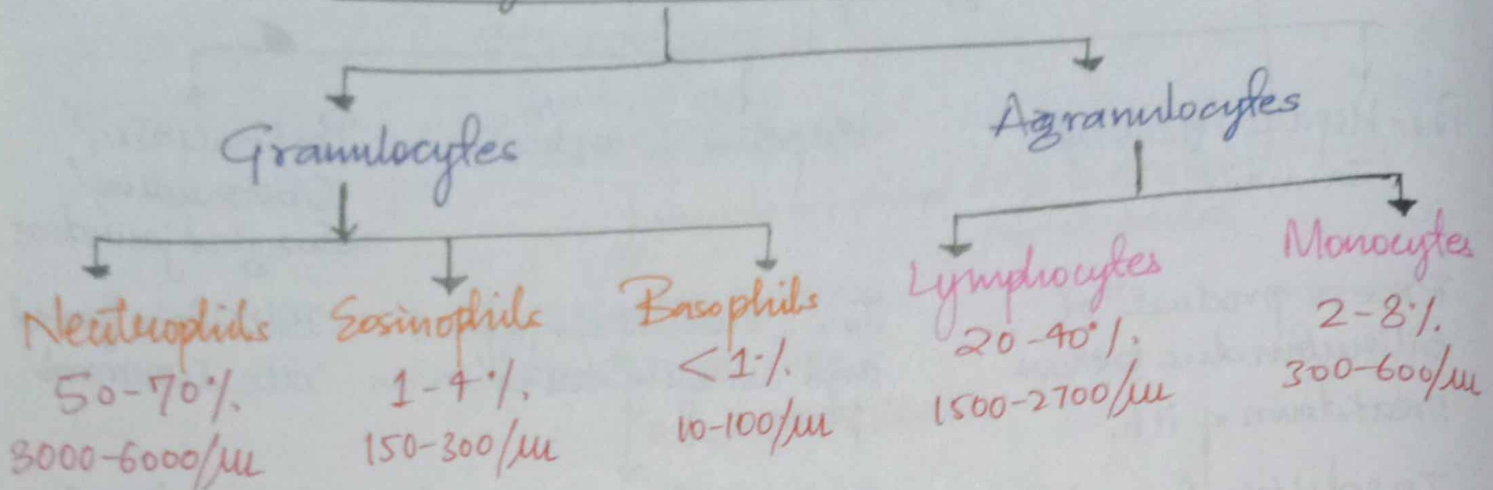


Leucocyte - White Blood Cells (WBC)



Total Leucocytes count:

During Birth: 20,000/μl

During Adult: 4,000-11,000/μl

Function of WBC:

1. Protect against any illness and disease.
2. Provide immunity.
3. They ingest foreign materials & cellular debris.

1. Neutrophil
- Nucleus purple in color
 - Multilobe (i.e. polymorphonuclear)
 - More the lobe more maturity
 - Granules are present
 - Granules take both acidic and basic stain hence called Neutrophil.
 - Reddish-brown or purple stain.

• **First line defense.**

• **Phagocytosis of foreign material.**

Neutrophilia (inc.)

- Due to exercise
- After epinephrine injection
- Pregnancy, menstruation, lactation
- Burns, After haemorrhage, Myocardial infarction.

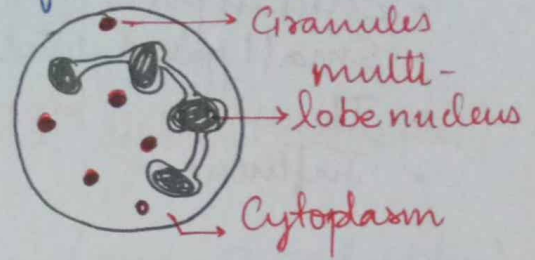
Neutropenia (dec.)

- Typhoid/Paratyphoid
- Viral infection
- Bone marrow depression

- Neutrophil circulating at a time in blood called "Neutrophil Circulating granulocyte pool." (CGP)
- Same no. of neutrophils attach to lining of Blood vessel called Marginate granulocyte pool. (MAP)

$$\boxed{\text{TBCP} = \text{CGP} + \text{MAP}}$$

(Total Blood granulocyte pool)

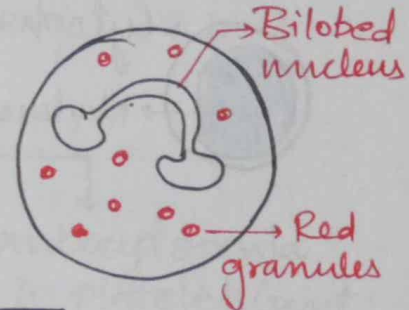


2. Eosinophil

Size - 10-14 μm
 life span -

- Nucleus purple color
- 85% Bilobed nucleus
- 15% trilobed nucleus
- Acidophilic stain hence eosinophilic.
- Pink color stain.
- Bright Red granules.

- Mild phagocytosis
- Help in allergic reactⁿ
- Engulf parasite



Eosinophilia

- Allergic conditⁿ e.g. Bronchial asthma
- Parasitic infection e.g. worm
- Skin disease

Eosinopenia

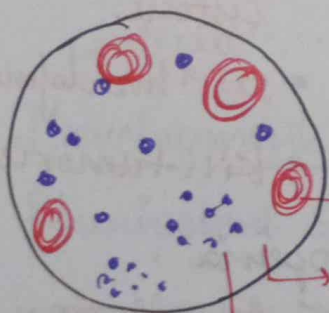
- Infection of ACTH (inc. in liver, spleen)

3. Basophil

size - 10-14 μm

- Purple nucleus
- Basic granules stain hence basophilic.
- Contain histamine and heparin.

- Mild phagocytosis
- Histamine help in allergic reaction.
- Heparin prevent blood from coagulatⁿ!
- Heparin activate hormone, lipoprotein meals.



RBC
 Plasma
 Basophil Cell → seen purple granules.

@surgeon911

Basophilia

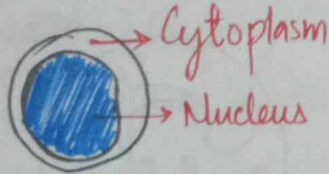
- Chicken pox
- Small pox
- Tb
- Influenza

Basopenia

- Administration of Glucocorticoids
- Drug induction Reactions

4. Lymphocytes Large lymphocyte \rightarrow (10-14 μm) precursors of small lymphocytes.

Small lymphocyte \rightarrow (7-10 μm)



- Responsible for antibody production
- Single nucleus occupy large cytoplasmic area
- Nucleus occupy $\geq 50\%$ of cell.
- Nucleus chromatin dense and lumpy.
- Cytoplasm less than nucleus.

\rightarrow Produce antibody to provide immunity.
(specially in delayed hypersensitivity)

Lymphocytosis

- TB
- Lymphatic Leukaemia
- Viral infection

Lymphopenia

- AIDS
- Hypoplastic bone marrow

5. Monocytes

Size - 10-18 μm

- Pale staining
- Single nucleus $\leq 50\%$ of cell.
- Agranules i.e (no granules)

- Active phagocytosis.
- 2nd line defence
- Kill tumor cells

Monocytosis

- Tb, • Syphilis, • Some Leukemias

Monocytopenia

- Hypoplastic Bone Marrow.

Platelets or Thrombocytes

General features :

1. Smallest blood cells (2-5 μm) diameter.
2. Colorless, spherical/oval/Rounded, Granulated body.
3. Nucleus is absent.

Count and Variations!

1. Normal count - 1.5 - 4 lakhs/ μl (avg. 2.59 lakh/ μl)
2. Lifespan - 8-12 days
3. Destructⁿ - Mainly in spleen

2/3rd in blood Circulating \rightarrow 1/3rd spleen (Reserve pool)

4. Variations

Thrombocytosis

Inc. in platelets count

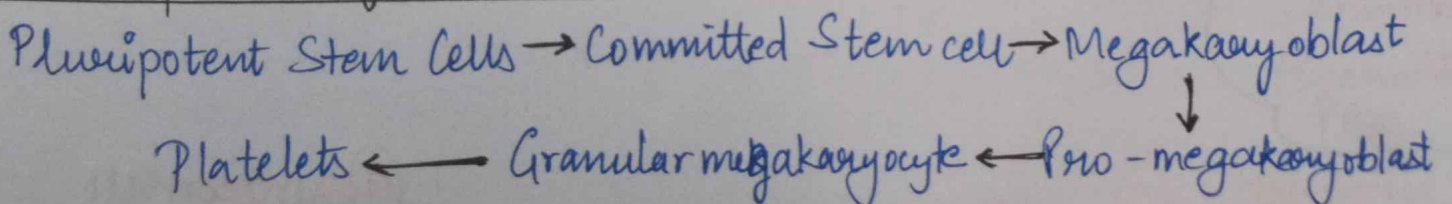
- After administration of epinephrine due to splenic contractⁿ.
- after trauma e.g surgery, injury, child birth etc..
- Splenectomy (removal of spleen)
- Thrombocytapheresis (experimental removal of platelets from circulatⁿ)
- Stress cause inc. epinephrine release resulting in spleen contractⁿ.

Thrombocytopenia

Dec. in platelets count

- Bone marrow depression.
 - Hypersplenism
 - Viral infectⁿ (Dengue fever)
 - Drug Hypersensitivity
- It leads to purpura which is associated with bleeding disorder.

Developments of Platelets



Ques Write function of platelets?

1. ~~Homeost~~ Haemostasis (Act as Vasocostrictⁿ)
Spontaneous arrest of bleeding by physiological process.
Haemostasis Mechanism:
 - (i) Platelets adhesion
 - (ii) Platelets activation.
 - (iii) Platelets aggregation.
2. Blood Coagulation: Loose aggregation of platelets is bound together and converted into definitive haemostatic plug by fibrin.
3. Clot Retraction: Within 5-30 min. of fibrin Clot formatⁿ, Clot retracts i.e it contract down to 40% of its original volume.
4. Phagocytic function: Platelets help in "phagocytosis" of carbon particles, virus & immune complexes.
5. Storage and transport functⁿ: It store 5-HT and Histamine which are released when platelets disintegrate and act on blood vessel.