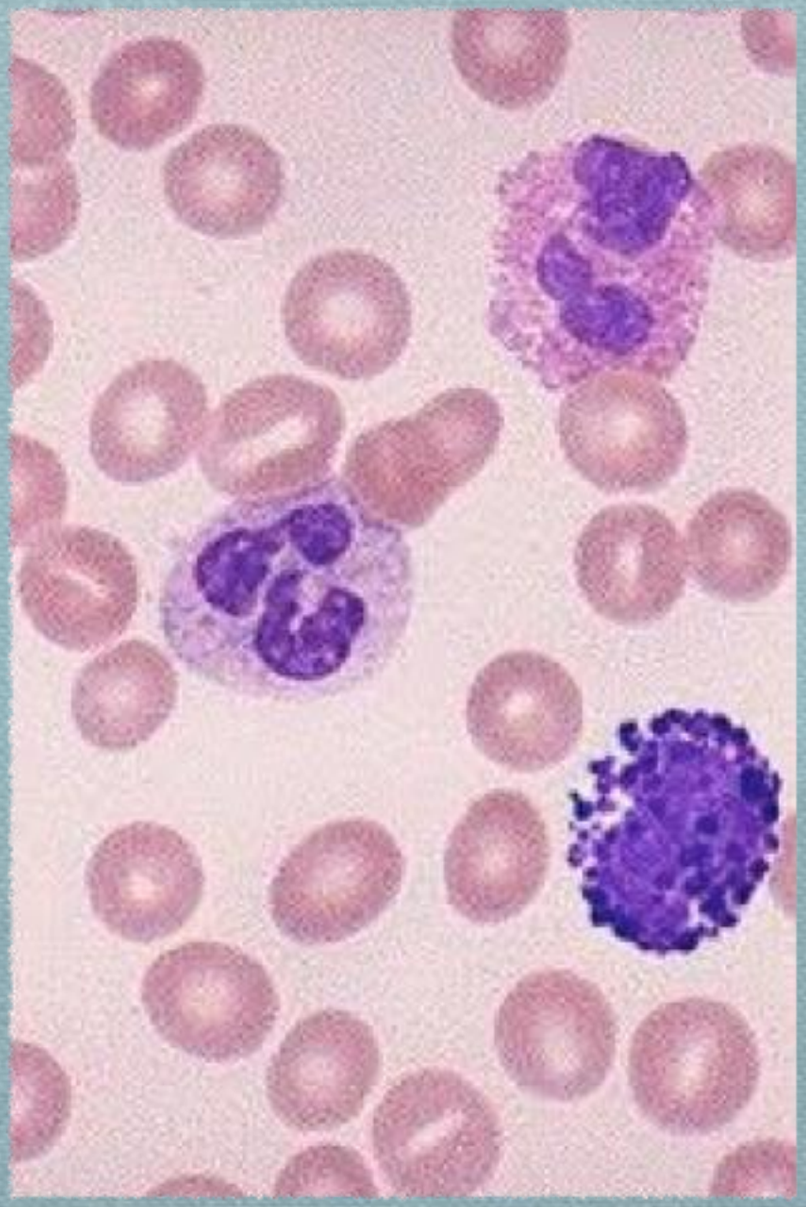

Blood Film Smear

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The Blood definition

- the fluid that circulates in the principal vascular system of human beings and other vertebrates .
- Blood is a mixture of cellular components suspended in plasma:

Red blood cells (RBCs)	White blood cells (WBCs)	platelets

- The adult human body contains approximately 5 liters of blood . it makes up 7 to 8 percent of a person's body weight.

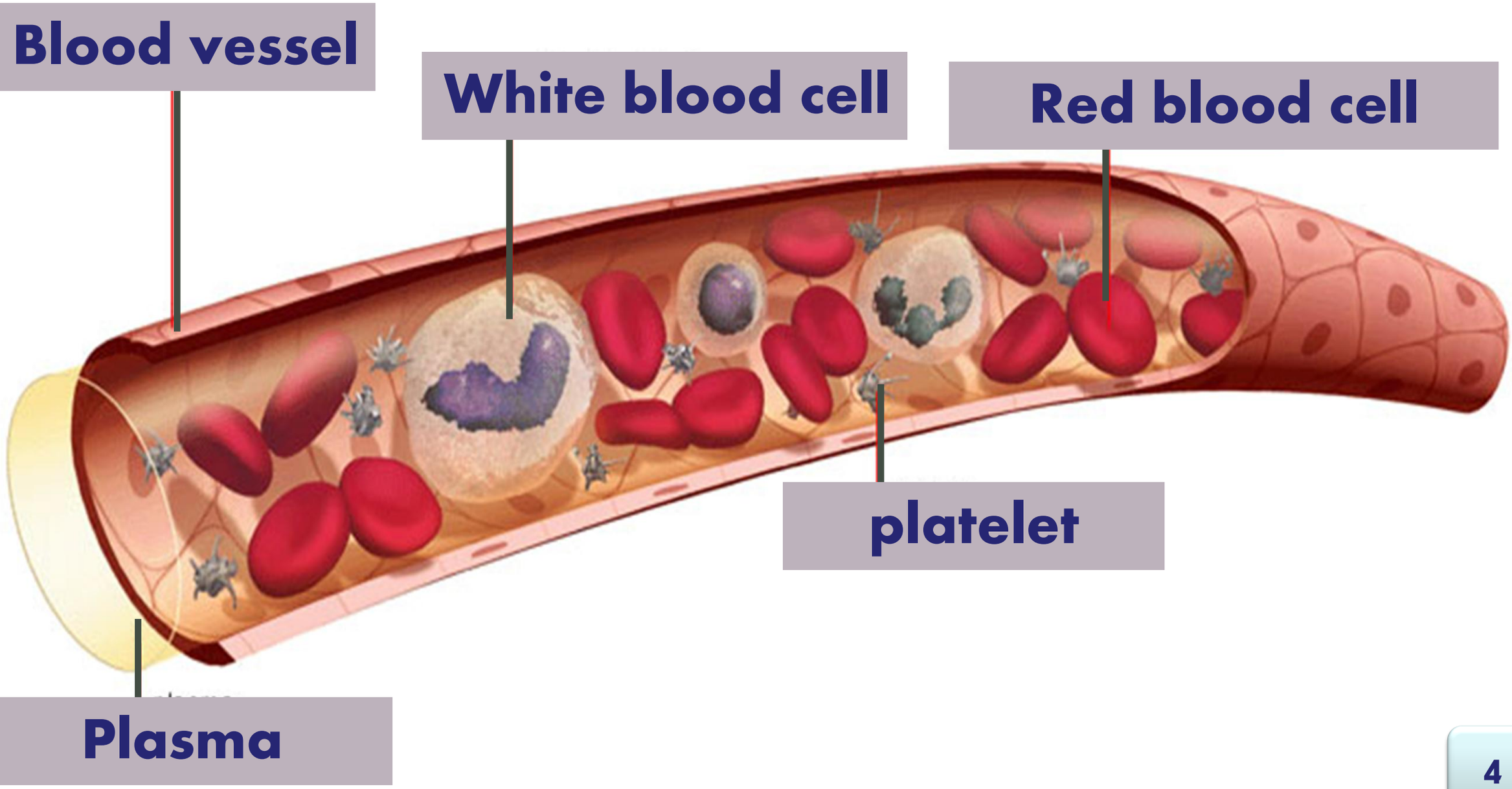
Functions of Blood

- **Transports**
  - Waste Products
  - Nutrients
  - O_2 & CO_2
  - Hormones
- **Defense:**
  - Foreign organisms
  - Clotting process
  - Body temperature
  - Injury/infection

Red blood cells (RBCs)

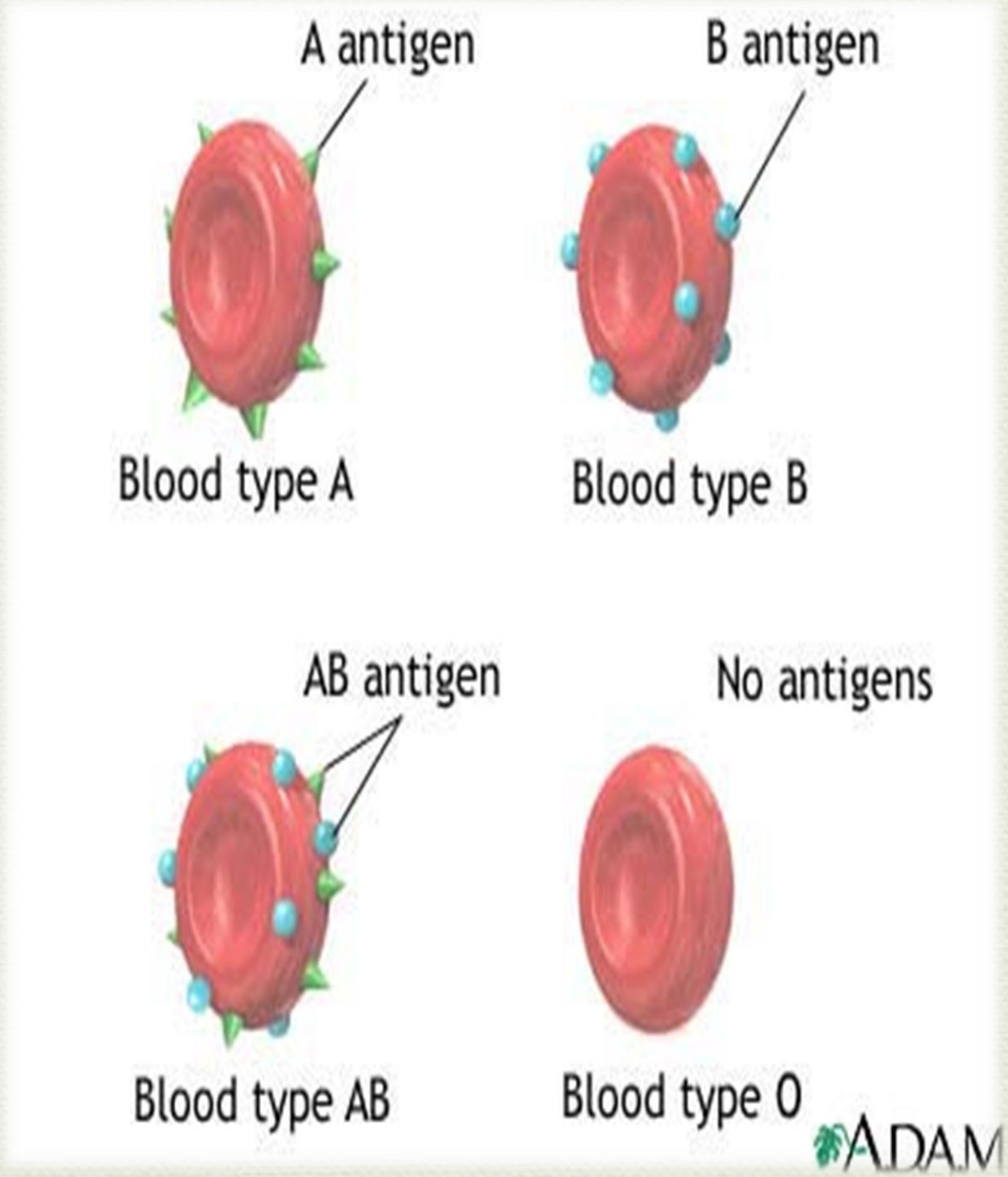
- biconcave shape.
- lack a nucleus.
- contain <u>haemoglobin</u>.
- Primary Function = Transport oxygen from the lungs to the cells of the body & assist with CO_2 removal.
- Short Life Span (~120 days).

Components of Blood



Red blood cells (RBCs) cont,

- Blood type is based on the presence of 2 major antigens in RBC membranes-- A and B



White Blood Cells (WBCs)

- Part of the immune system (Mobile units of body's defense system)
- WBCs count is used as an indicator for disease.
- Divided into 2 parts depending on the presence of granules:

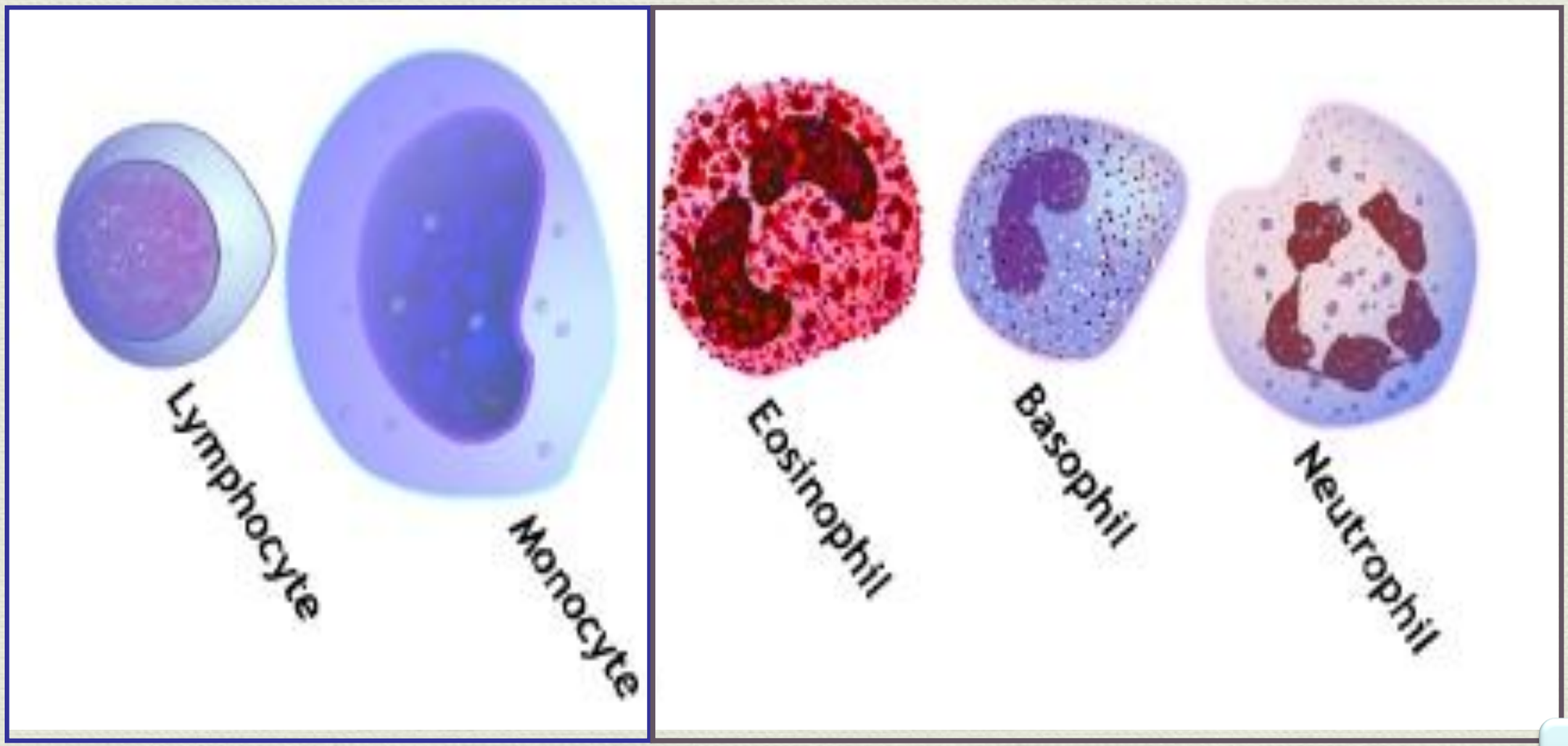
Granulocytes

Agranulocytes

Types of WBC's

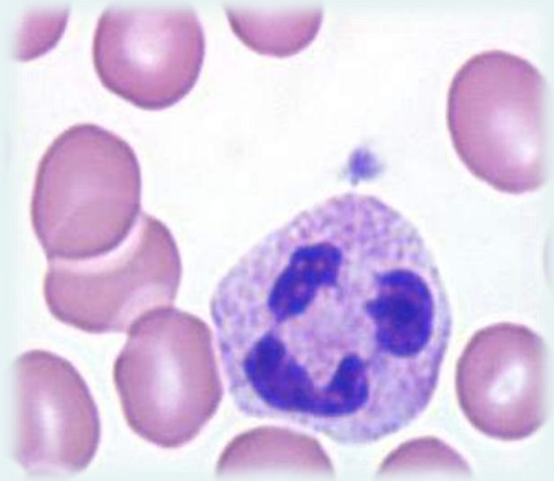
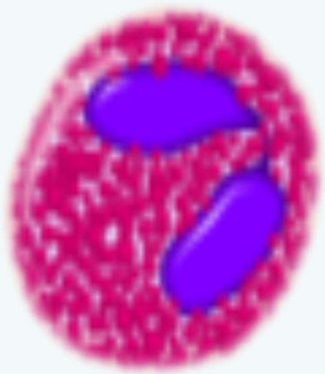
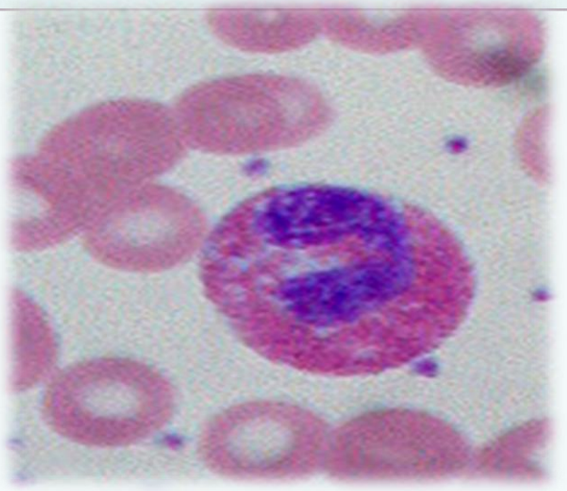
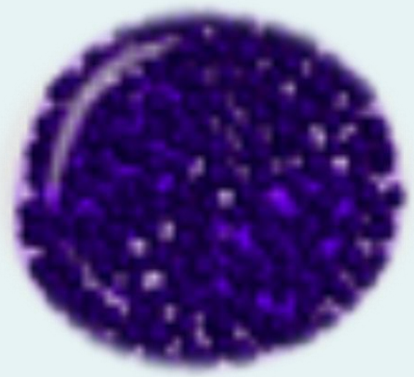
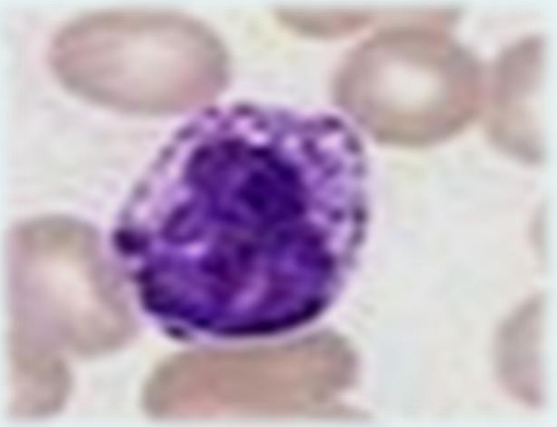
Agranulocytes

Granulocytes



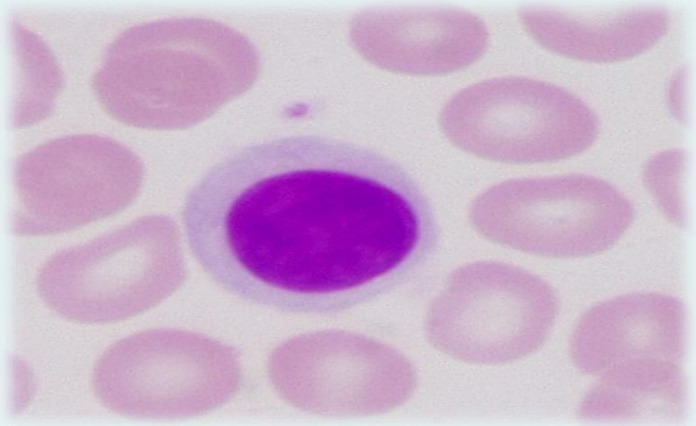
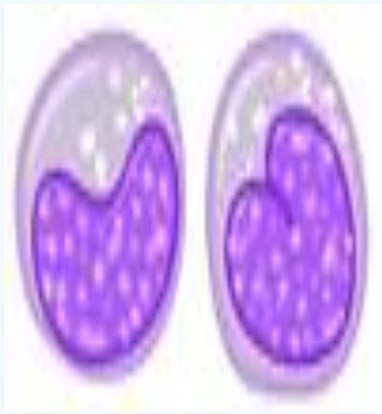
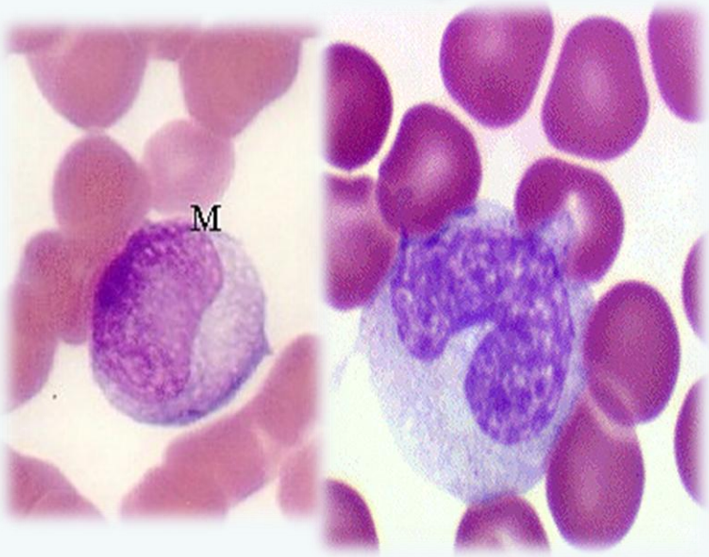
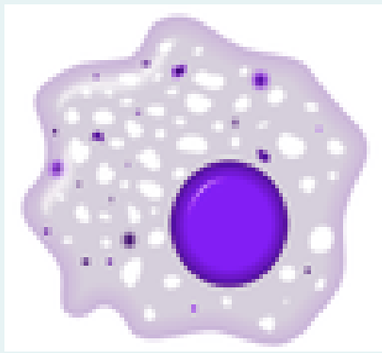
Granulocytes

- Characterized by the presence of granules in the cytoplasm when stained and viewed under a microscope.
  - The main function of these enzymes is the digestion of endocytosed material.
- Three types depending on the staining properties:
  1. **Neutrophil**.
  2. **Eosinophil**.
  3. **Basophil**.

Type Granulocytes	Nucleus	Approx. % in adults	Diagram	Microscopic Appearance
Neutrophil	multilobed	62%		
Eosinophil	bi-lobed	2.3%		
Basophil	bi-lobed or tri lobed	0.4%		

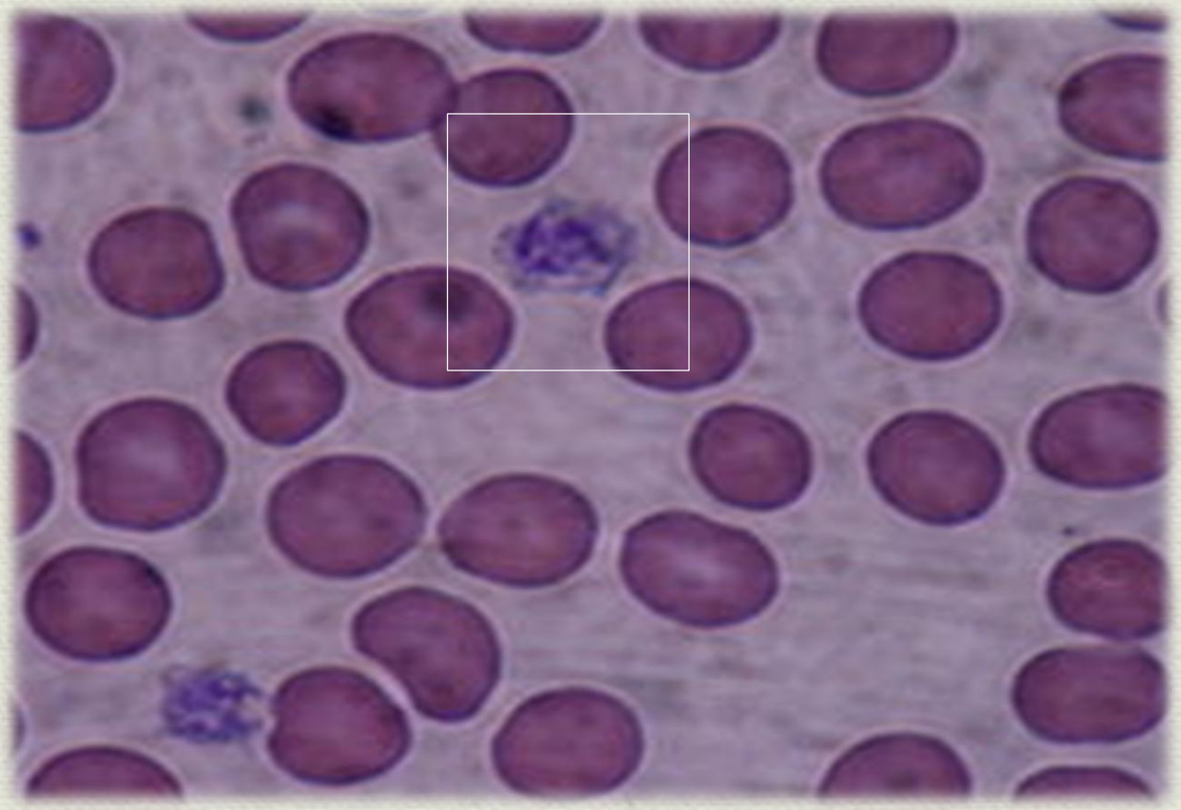
Agranulocytes

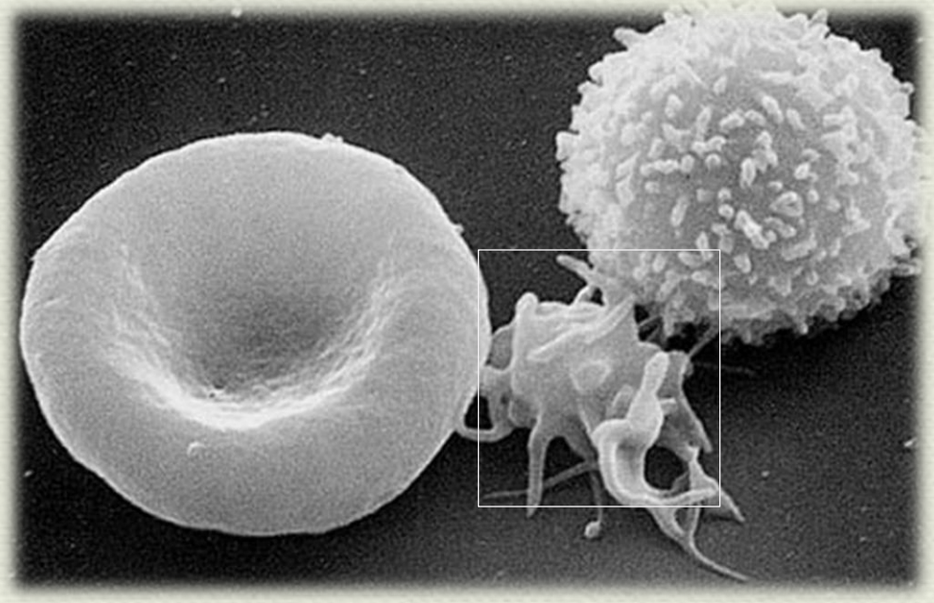
- Stained granules are absent.
- Three types:
  1. **Lymphocytes.**
  2. **Monocytes.**
  3. **Macrophages.**

Type	Nucleus	Approx. % in adults	Diagram	Microscopic Appearance
Lymphocyte	deeply staining, eccentric	30%		
Monocytes	kidney shaped	5.3%		
Macrophages	-	-		

platelets

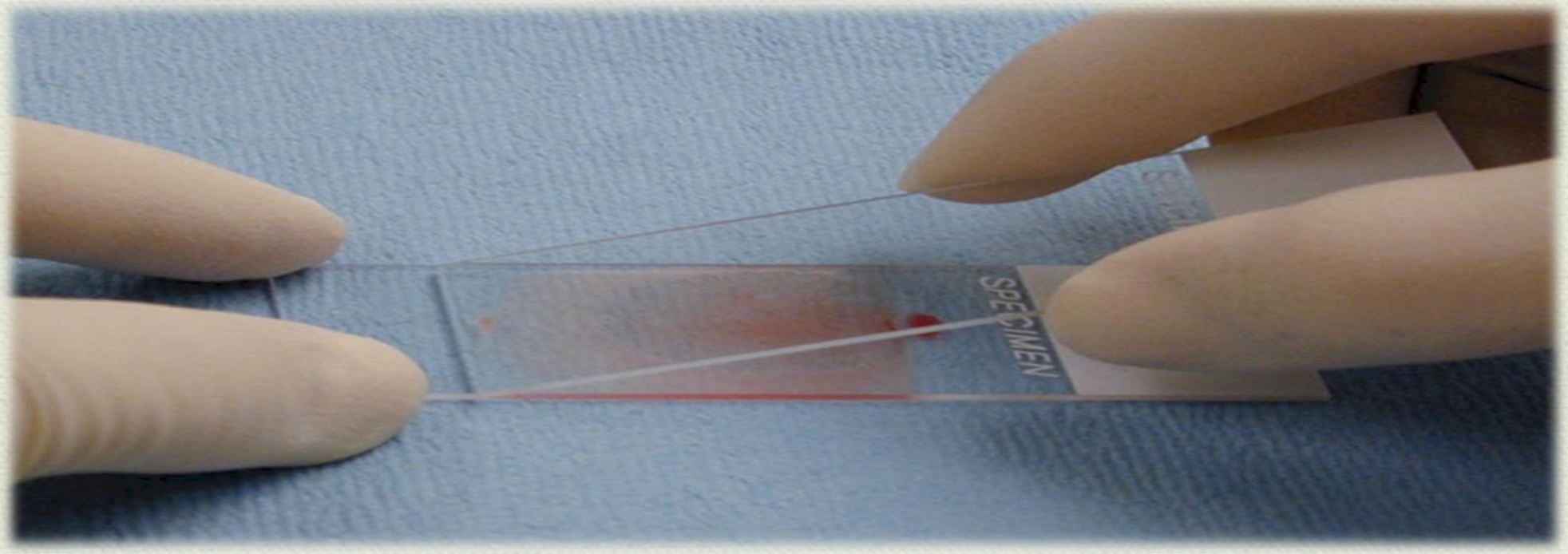
- small, irregularly shaped clear cell fragments
- formation of blood clots.





Red blood cell, platelet, and white blood cell

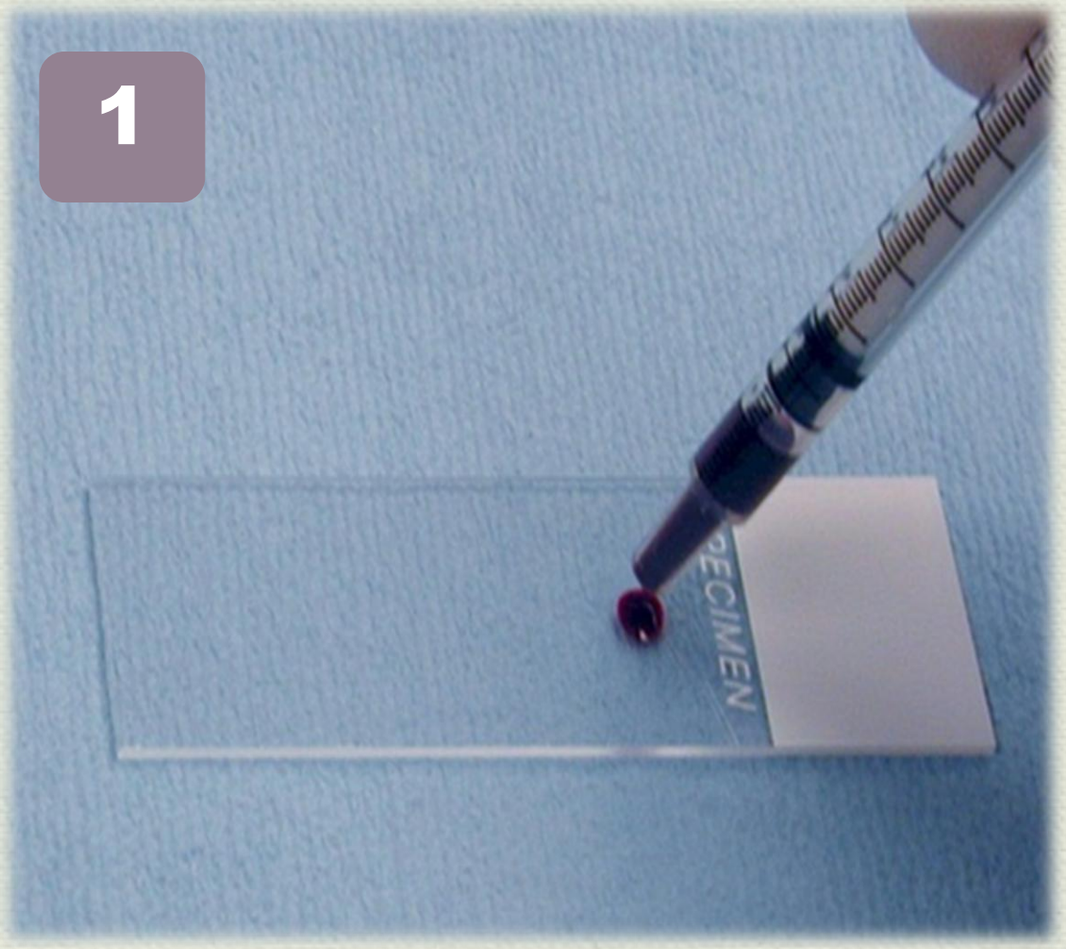
Blood “film” smear

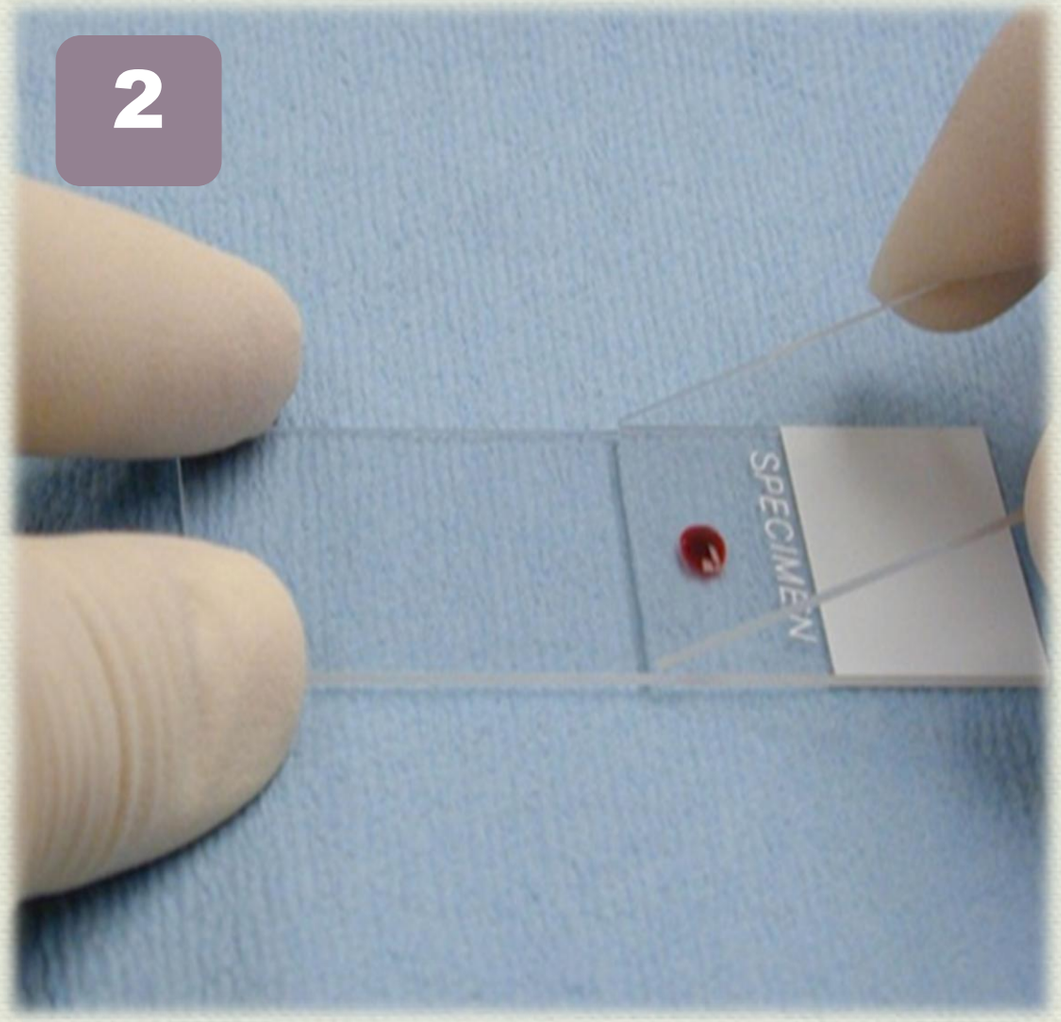


Application **/Examination of the morphological and differential WBCs count.**

Blood smear preparation and staining

1-Place a drop of blood on a clean glass slide.

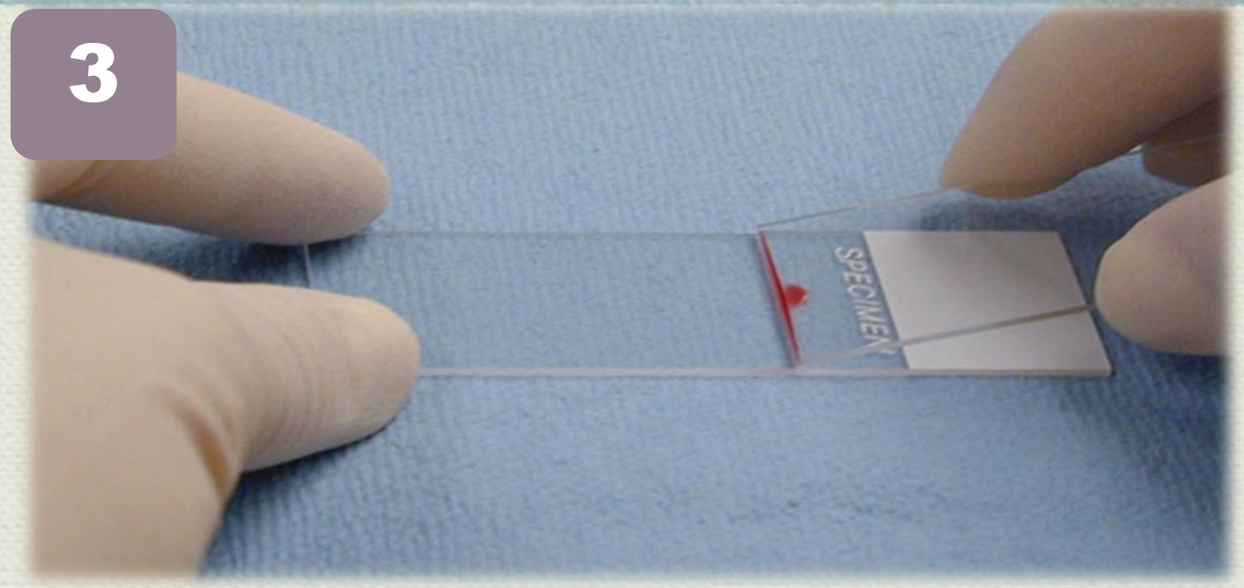


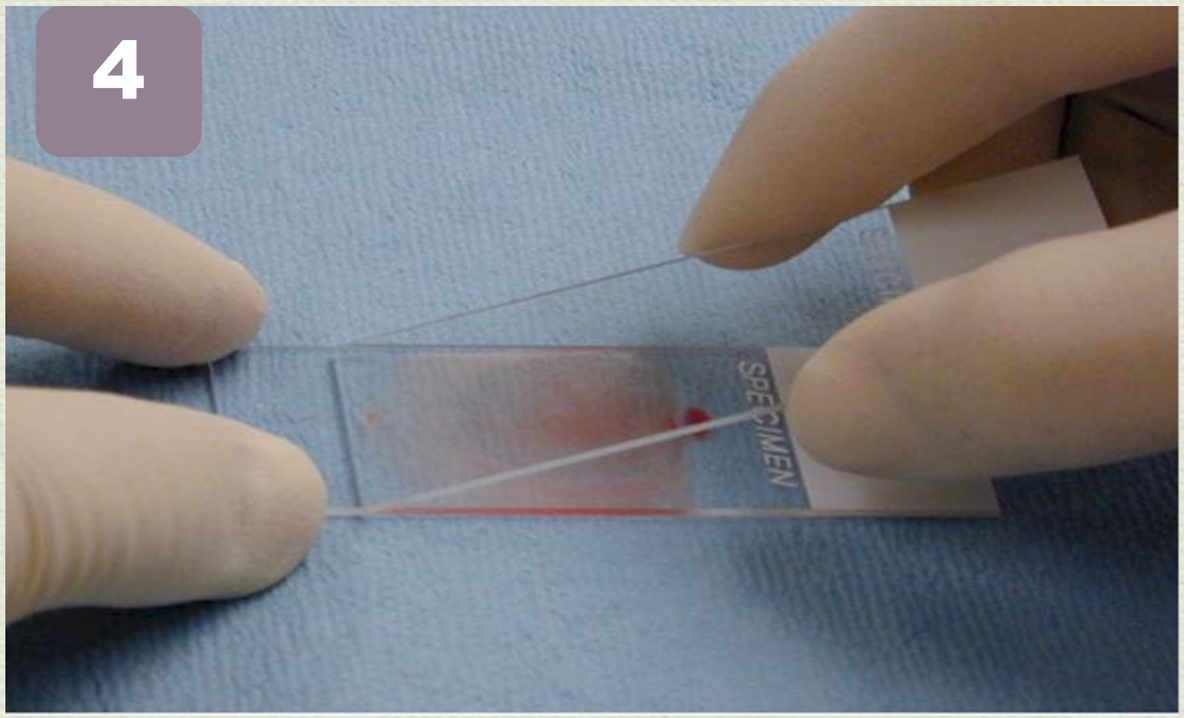


2-Hold a spreader slide at a 30-45 ° in front the blood drop.

Blood smear preparation and staining cont,

3- In a smooth move, draw the spreader slide away It should form a bullet shape. from the blood drop.

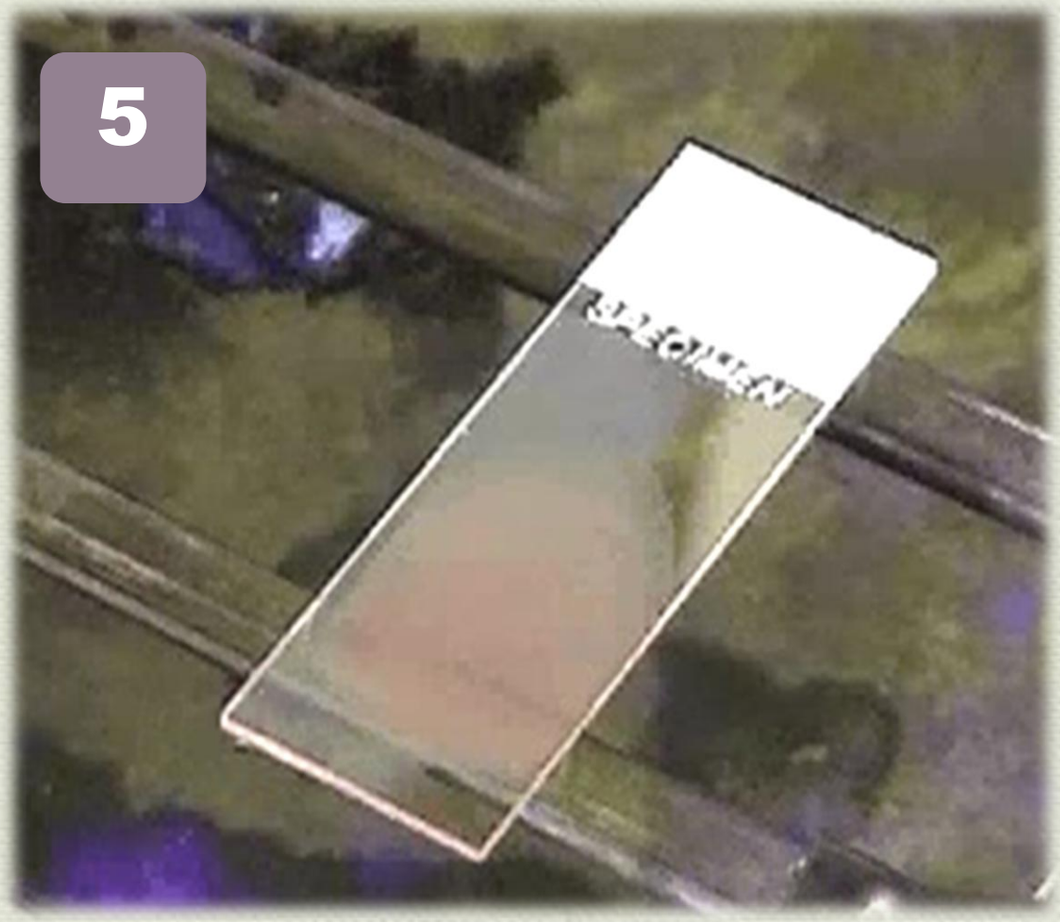


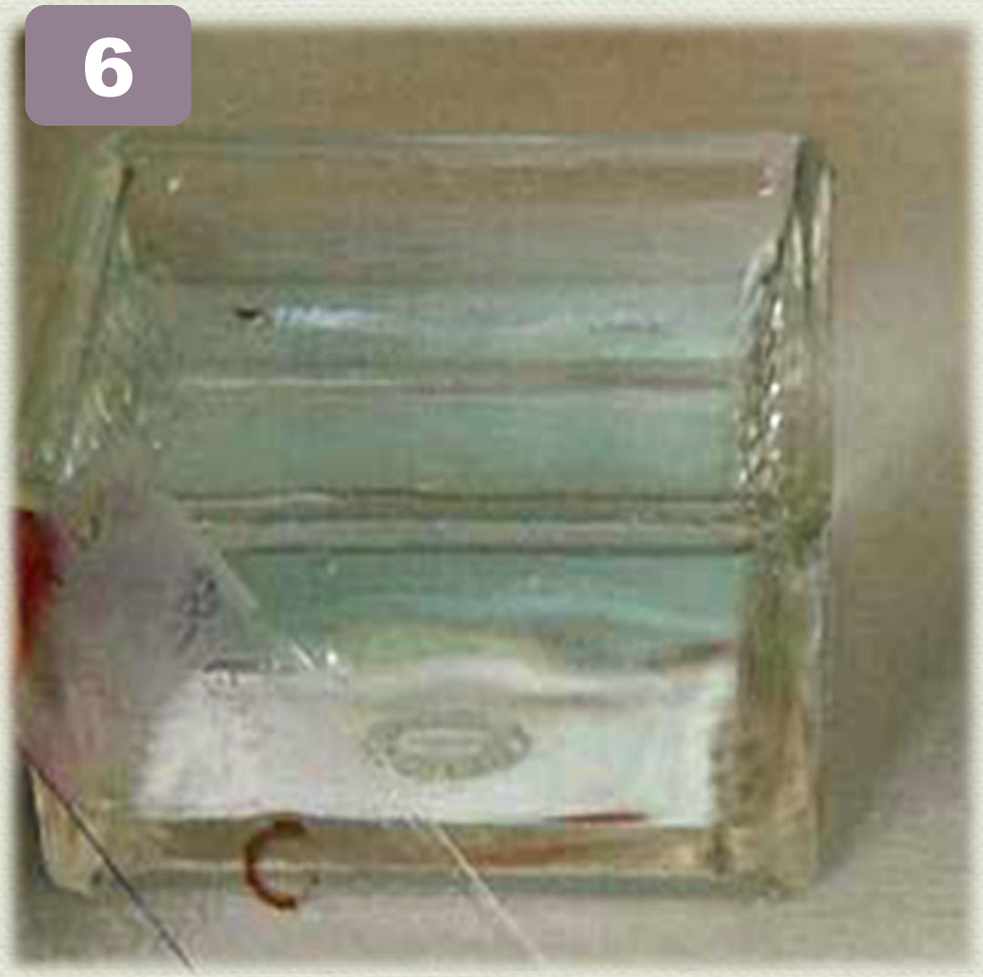


bullet shape

Blood smear preparation and staining cont,

5- Leave it to air dry.

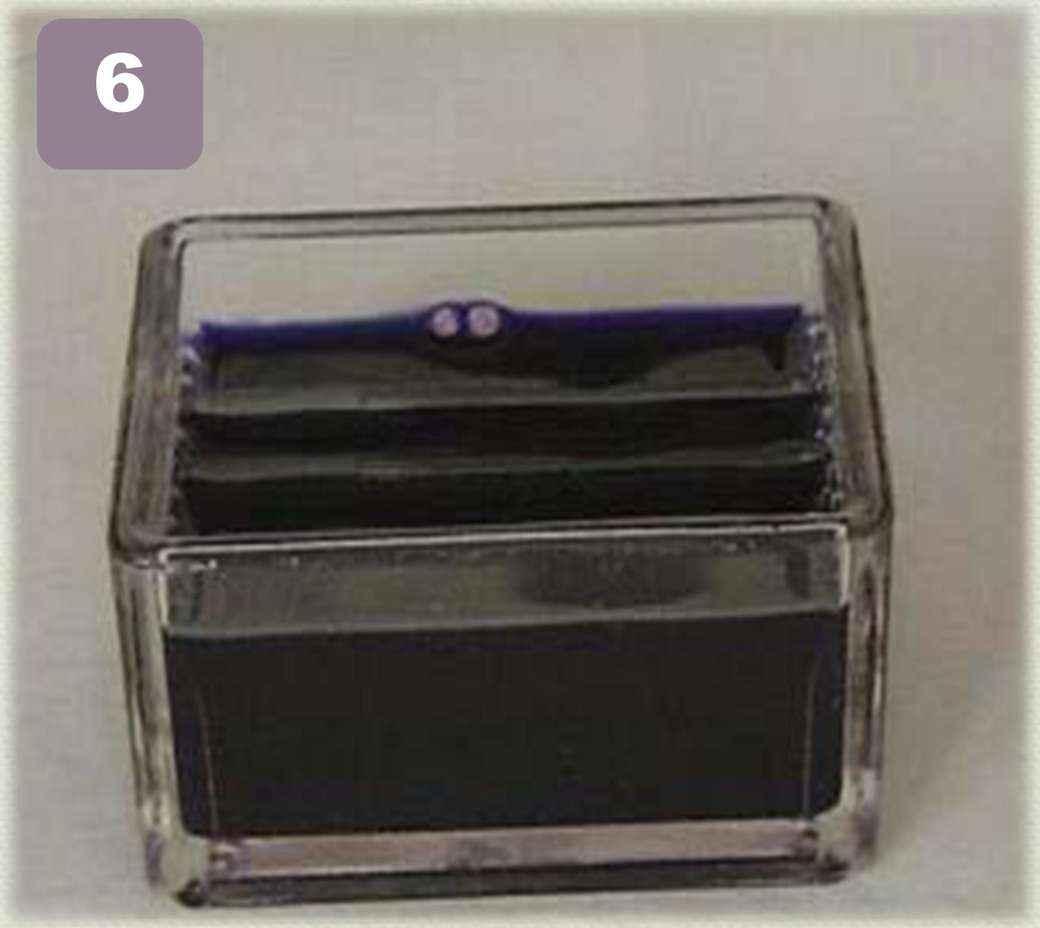




6- Fix the specimen with Absolute Methanol or 100 %

Blood smear preparation and staining

6- Stain with Geimsa for 15min.



6- Washing The slidw by the water.

7- Examine under the Microscope

Notes

- **RBCs are mostly found at the head and distortions are found at the edges.**
- **Small WBCs like Lymphocytes are almost always found in the middle.**
- **Large WBCs like Monocytes and abnormal cells are found in the tail.**