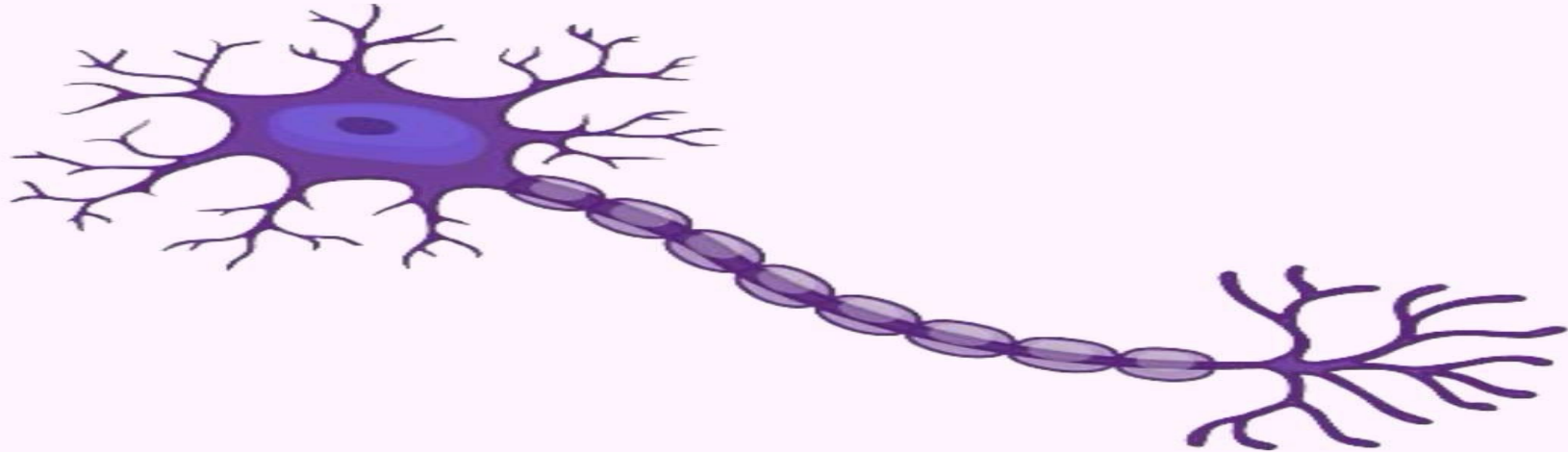




PHYSIOLOGY



LEC NO. : Lab - 2
DONE BY : Malak Al-humaid

وَقُلْ رَبِّ زِدْنِي عِلْمًا

The background features abstract, overlapping geometric shapes in various shades of green, ranging from light lime to dark forest green, set against a white background. The shapes are primarily triangles and polygons, creating a modern, layered effect.

Total white blood cell count by **D Gehan el wakeel**

White Blood Cells (WBCs)

خط الدفاع الأول في الجسم

بيضاء لانها لا تحتوي على الميمو كلوين

protecting the body from toxins and diseases

Count of WBCs:

Ranges **from 4000-11000/mm³**] → normal

يتم تصنيع wbc في:
Bone marrow

Types and Functions of WBCs:

* They are classified into 2 types according to cytoplasmic granules; ^① granular (their cytoplasm contains granules) and ^② agranular their cytoplasm contains no granules

a. **Granular** are 3 types neutrophils, basophils and Eosinophils

b. **Agranular** are 2 types monocytes and lymphocytes

* These cells provide the body with powerful defenses against viral, bacterial and parasitic infections by 2 different ways;

a. **Phagocytosis.**

b. **Formation of antibodies and sensitized lymphocytes**



Neutrophils



Eosinophils



Basophils



Lymphocytes



Monocytes

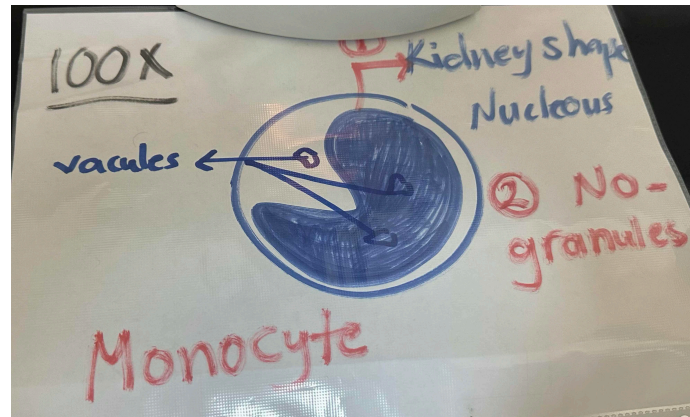
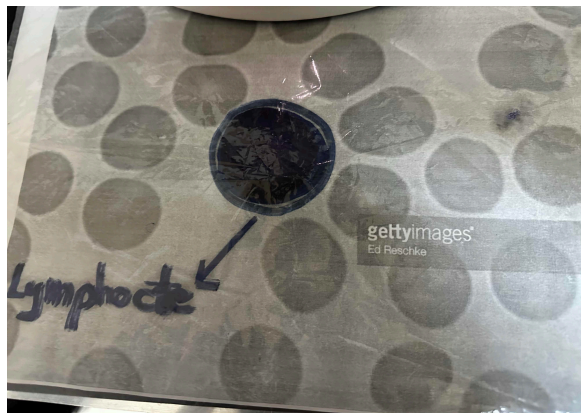
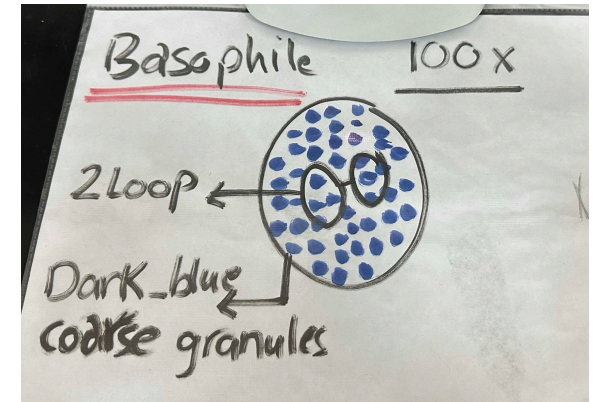
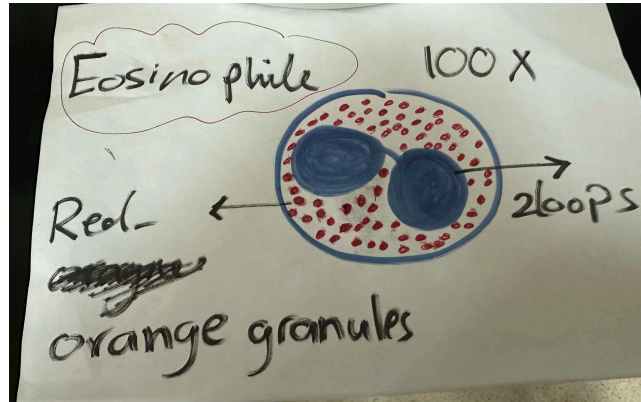
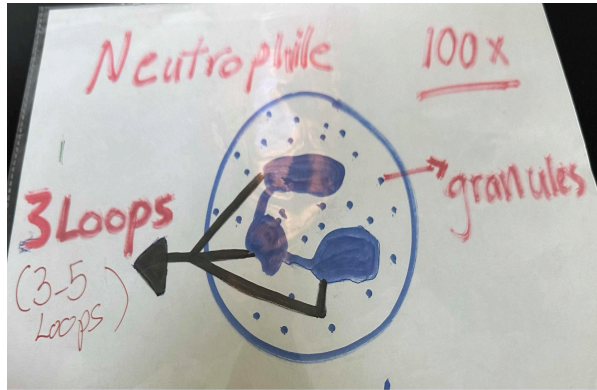


Platelets



Erythrocytes

Blood cells including white blood cells



	Granular leukocytes			A granular leukocytes	
	Neutrophils	Eosinophils	Basophils	Lymphocytes	Monocytes
Site of formation	Formed in the bone marrow			Formed in the lymphoid tissues.	Formed in the bone marrow
Cytoplasmic granules	contain granules			contain no granules	
% of total leukocytes	60-70%	1-5%	0.0-1.0%	20-30%	3-8%
Life span	4 -5 days			months or even years	
Functions	First line of defense against bacterial infection by phagocytosis	1. Defense against parasite 2. decrease allergic reaction	1. Synthesize and liberates heparin into blood 2. Histamine for al	1. T lymphocytes for cell mediated immunity 2. B lymphocytes secrete antibodies	Phagocytosis of bacteria and old cells such as RBCs

Pathologic variation in leucocytic count:

▶ **1) Leucopenia:**- It means diminished white blood cell count below 4000 cell/mm^3 , -it is found in enteric fever and acute viral infections.

▶ -as well as depression of bone marrow due to radiation, poisoning or chemotherapeutic agents / toxins / antibiotics

▶ **2) Leucocytosis:** It is an increase in the number of white blood cells above 11000 cell/mm^3 . It occurs in any condition with tissue destruction as:

↓ stress
WBCs بزيادته

▶ - Tissue inflammation with pus formation. - Cardiac infarction.

▶ - It may occur physiologically in pregnancy, after cold bath, muscular exercise and following meals.

▶ **3) Agranulocytosis:**

▶ It is a condition in which the bone marrow stops production of white cells leaving the body unprotected against bacteria and other agents. This is due to drug toxicity or gamma irradiation. It is a rapidly fatal disease.

في عملية عد WBCs تستخدم
Fork's solution
↳ which enclosed : 9.8% d. water / 1% glacial acetic acid
0.1% gentian violet
solution : WBCs يصنع
↓
فاد يوسيه RBCs
عناياتا مش عيزها

▶ **4) Leukemias:**

▶ It is a malignant disease of the bone marrow leading to uncontrolled production of abnormal white blood cells. The leukemic cells are usually non-functional, for the usual protection against infection. They utilize the nutrients needed by other tissues leading to severe wasting

Questions

▶ WHICH IS THE NAME OF THE COUNTING CHAMBER USED FOR COUNTING THE TOTAL WHITE BLOOD CELLS?

- a) Calorimeter
- b) Sphygmomanometer
- c) Hematocytometer
- d) Thermometer
- e) Counting microscope

Which is the WBCs diluting fluid used in the procedure of counting of total white blood cells ?

- a) Saline
- b) Serum
- c) Distilled water
- d) **Turk's solution**
- e) Tyrod's solution

Which is a condition characterized by leukocytosis with abnormally functioned white blood cells ?

- a) Leucopenia
- b) Polycythemia
- c) Agranulocytosis
- d) Anemias
- e) **Leukemia**

Depression of bone marrow leads to which of these conditions?

- a) Leukemia
- b) Polycythemia
- c) Thrombocytosis
- d) Leucopenia**
- e) Hemolysis