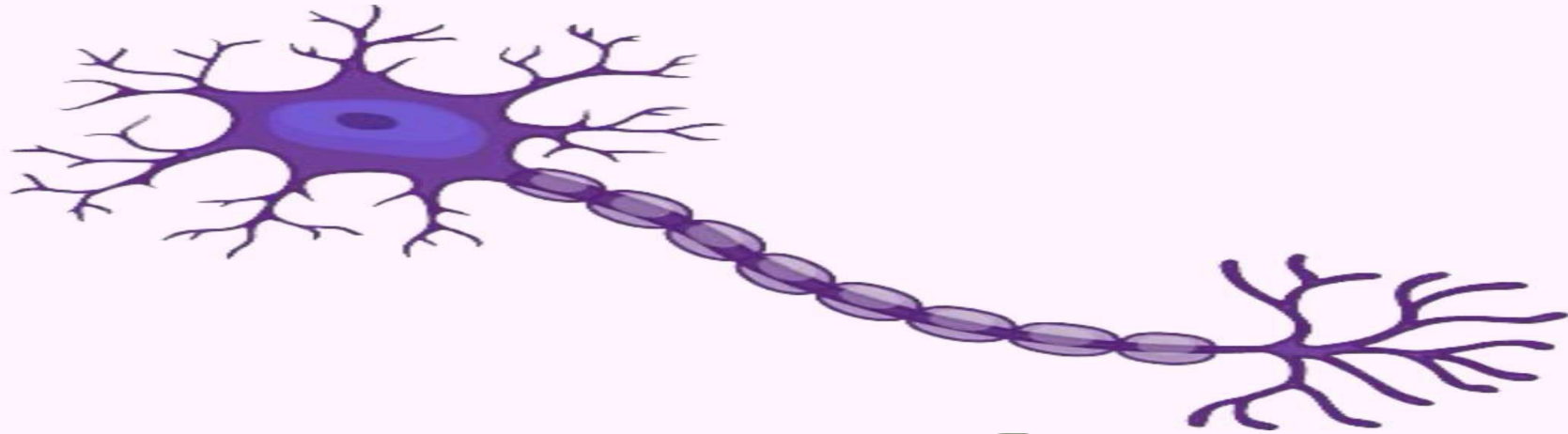


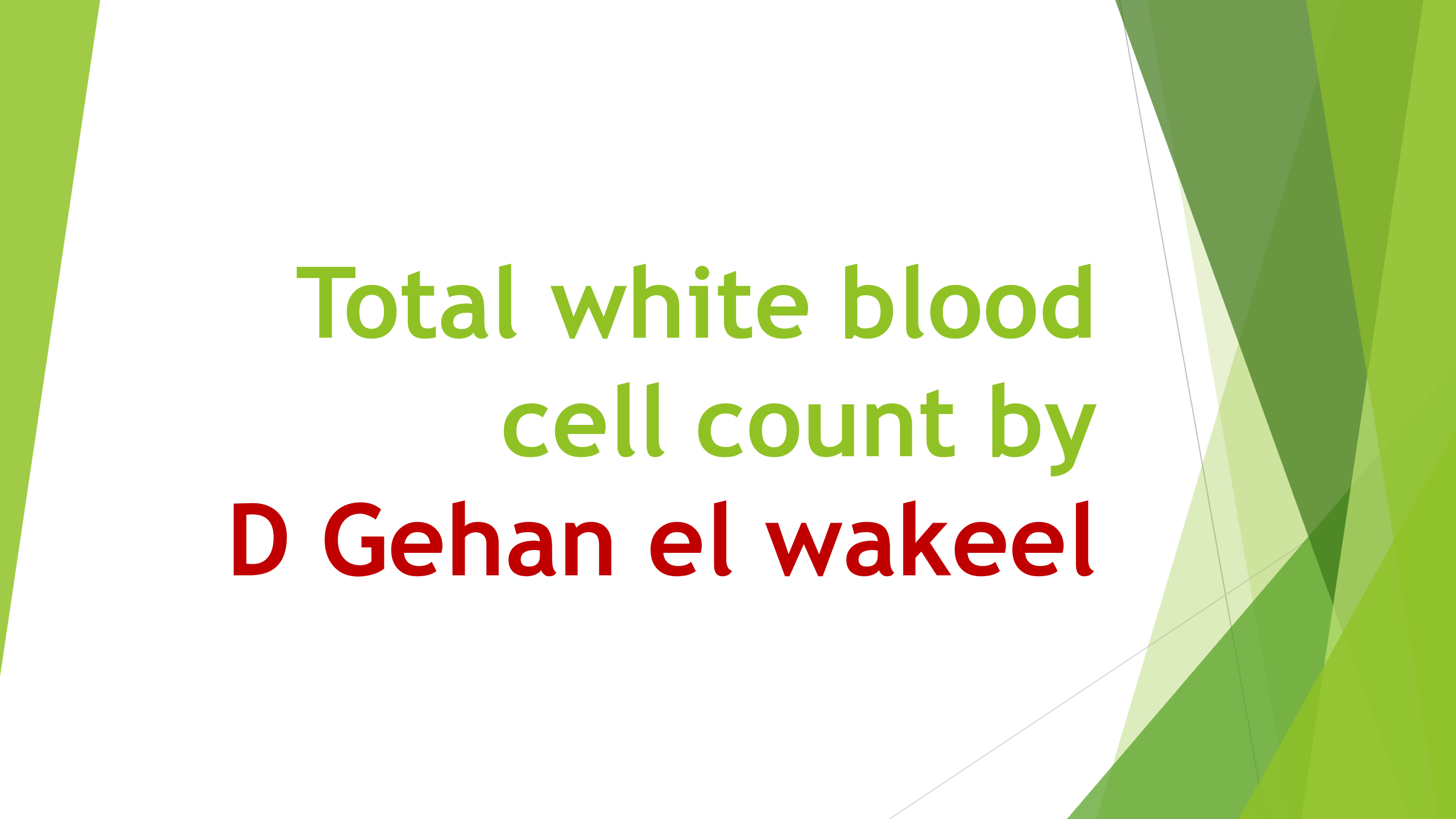


PHYSIOLOGY



LEC NO. : _____ Lab ②
DONE BY : _____ Amir.A.F

وَبِقَوْلِ رَبِّي عَلِمًا

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 quadrilaterals, creating a dynamic, layered effect.

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

White Blood Cells (WBCs)

Count of WBCs:

Ranges from 4000-11000/mm³.

- Normal range -

Leukopenia
decreasing in the
number of WBCs

Types and Functions of WBCs:

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

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

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

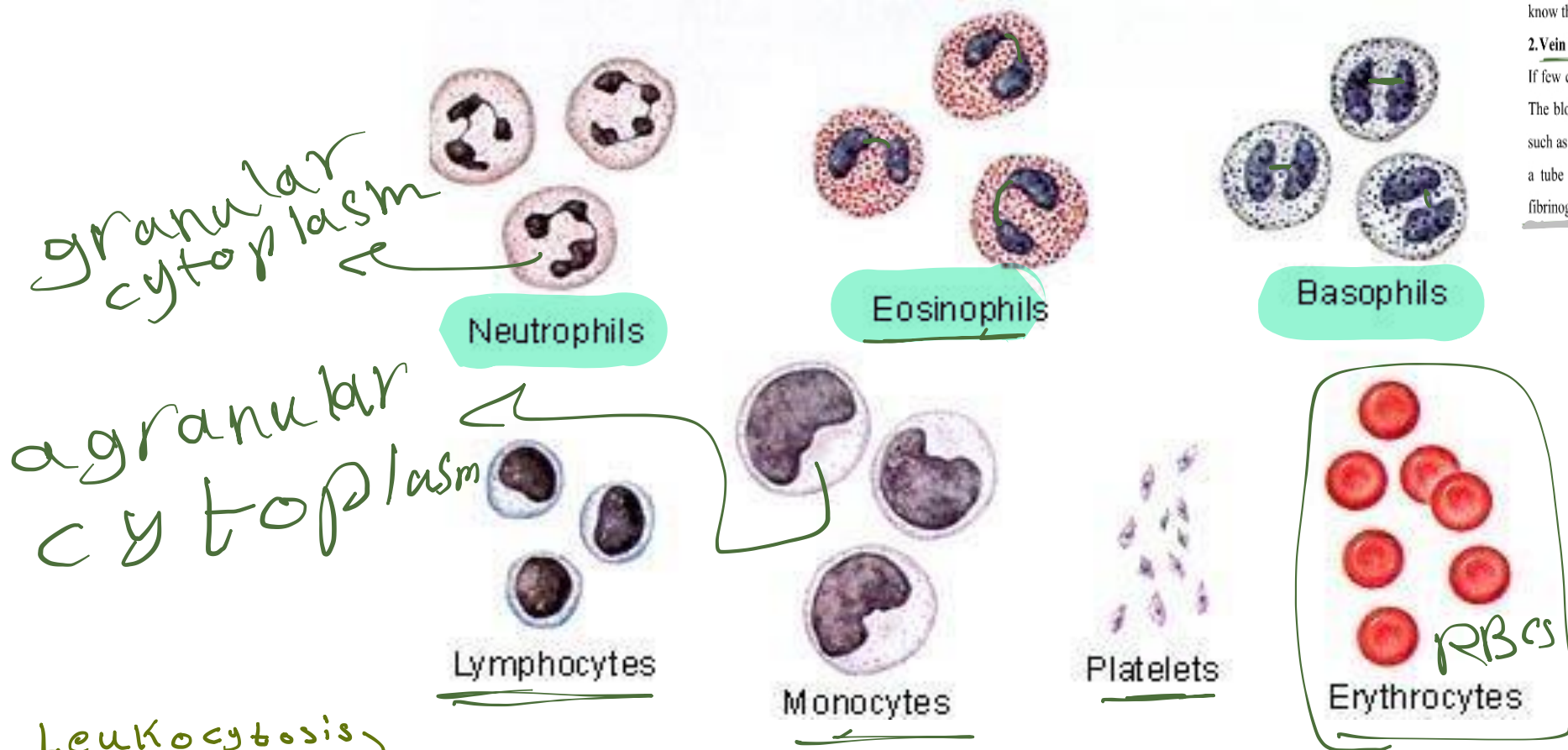
* These cells provide the body with powerful defenses against viral, bacterial and parasitic infections by 2 different ways;

a. **Phagocytosis.**

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

لحم الخلايا الكفافية الحساسة

السرورى
الطيلية



granular cytoplasm

agranular cytoplasm

Leukocytosis
increase the number of WBCs

Blood cells including white blood cells

1. Capillary puncturing: *little amount*

The puncture is usually made on the middle finger of the right hand. To increase the circulation, the fleshy portion of the middle finger is massaged. When the finger is punctured, the blood forms a rounded drop so then it can be sucked into a capillary tube. This method usually used if you want to know the type of your blood and doing pev test (not much blood is needed).

2. Vein puncture: *large amount*

If few cubic centimeters of blood are required to perform the test, the blood is obtained from a vein. The blood sample can be collected in an anticoagulant tube (tube contains anticoagulant substances such as Sodium citrate, EDTA and Heparin) in this case we can obtain plasma or it can be collected in a tube without an anticoagulant substance and in this case we can obtain serum (plasma minus fibrinogen).

from manual

	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	<ol style="list-style-type: none"> 1. Defense against parasite 2. decrease allergic reaction 	<ol style="list-style-type: none"> 1. Synthesize and liberates heparin into blood 2. Histamine for al 	<ol style="list-style-type: none"> 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:

For this exp we use WBC diluting fluid (Truk's solution)

▶ 1) Leucopenia: - It means **diminished white blood cell count** below **4000 cell/mm³**, تفاضل

-it is found in **enteric fever** and **acute viral infections**.

▶ -as well as **depression of bone marrow** due to radiation, poisoning or chemotherapeutic agents علاج كيميائي التسمم

▶ 2) Leucocytosis: It is an increase in the number of white blood cells above **11000 cell/mm³**. It occurs تدمير

in any condition with tissue destruction as:

▶ - **Tissue inflammation with pus formation.** التهاب القرح

- **Cardiac infarction.** → احتشاء القلب

▶ - 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. فادح

▶ 4) Leukemias: اللوكيميا

▶ 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** تستخرج

* خلايا اللوكيميا لا تعمل في الحماية من العدوي ولكنها تستهلك طعام غيرها من الخلايا الفعالة انهائة فاعلة

stress
cancer

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

from
manual

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

from
manual

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