white blood cell count
physiology lab **5**

Introduction

- The white blood cell count denotes the number of white blood cells per unit volume of whole blood. Normal WBC count range from 5000-11000 cell / mm2 this count varies with age.
- WBC count is useful to indicate infection or may be employed to follow the progress of certain disease.
- WBC in the circulation are not white in the sense that a sheet of white paper is white, but in the sense that they are transparent and not colored. White cells are fewer in number than red cells

Materials and Reagents

1-Anticoagulated whole blood or capillary blood can be used.

2-Turk's diluting fluid composed of:-

- Glacial acetic acid (3ml) to hemolyzed RBCs
- Aqueous gentian violet (1% w/v) (1ml) to color the nuclei of WBC
- Distilled water up to 100 ml.

3- WBC pipette, which is composed of a stem, mixing chamber, white bead inside the mixing chamber, aspiration tube (rubber sucking tube)

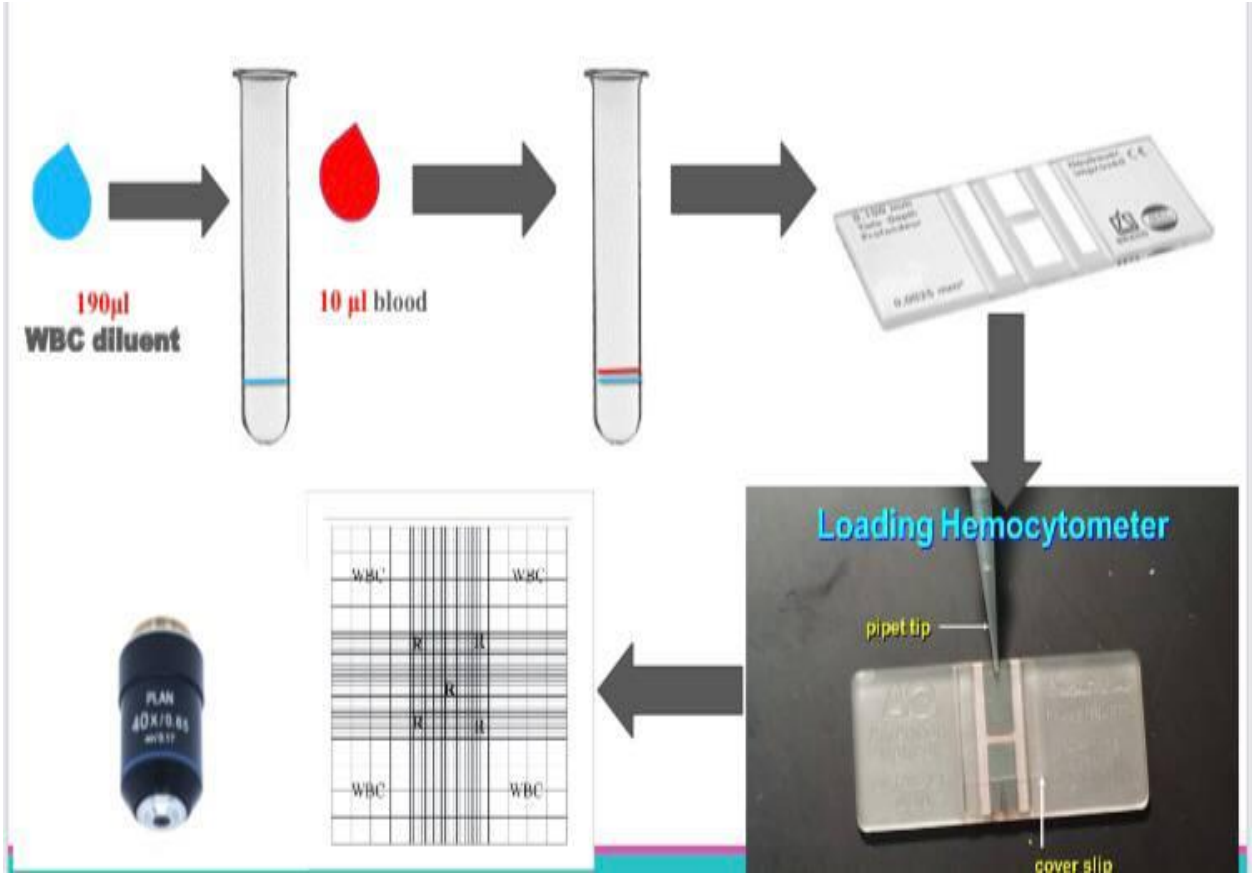
4- Hemocytometer (Neubauer's counting chamber) with a cover slip.

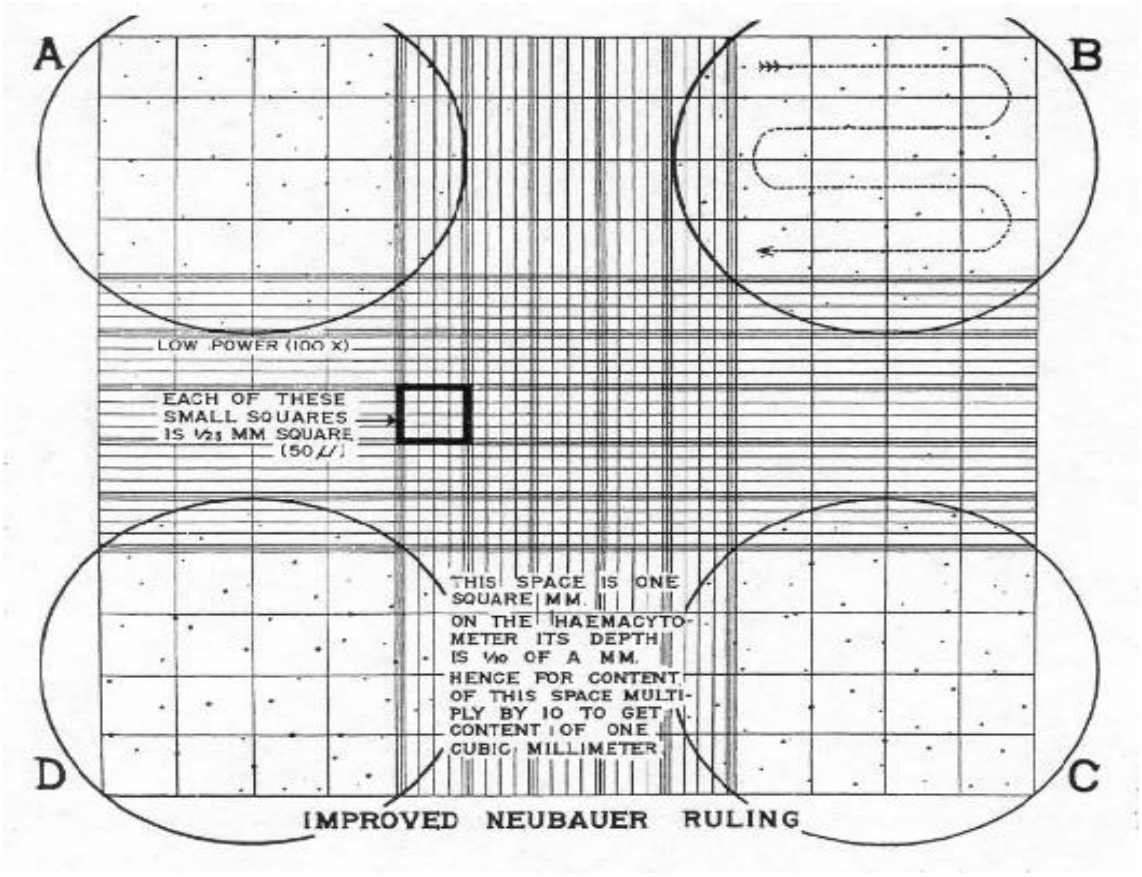
5- Microscope

6- Lancet

7- Cotton

- A white blood cell (WBC) count is a test that measures the number of white blood cells in your body in a cubic millimeter (mm3).
- The principle of this test is done by diluting the blood 20 time with WBC diluting fluid causing lysis leaving WBC with deep violet blue color of nuclei.





Procedure

1. Take 380 µl of diluting Turk's solution & 20 µl of blood in a test tube. fluid in plain tube.
2. Mix the contents for 5 minutes to ensure even distribution of cells.
3. Take 10 ml of mixture by pipette, hold the pipette at a 45 angle, and touch the pipette tip to the junction of the cover glass and the counting chamber. Allow the mixture to flow under the cover glass and completely charged.
4. Count the white cells in the four corner areas (A, B, C, and D of Figure)
5. Calculate the number of cells in cubic millimeter of blood as follows:-

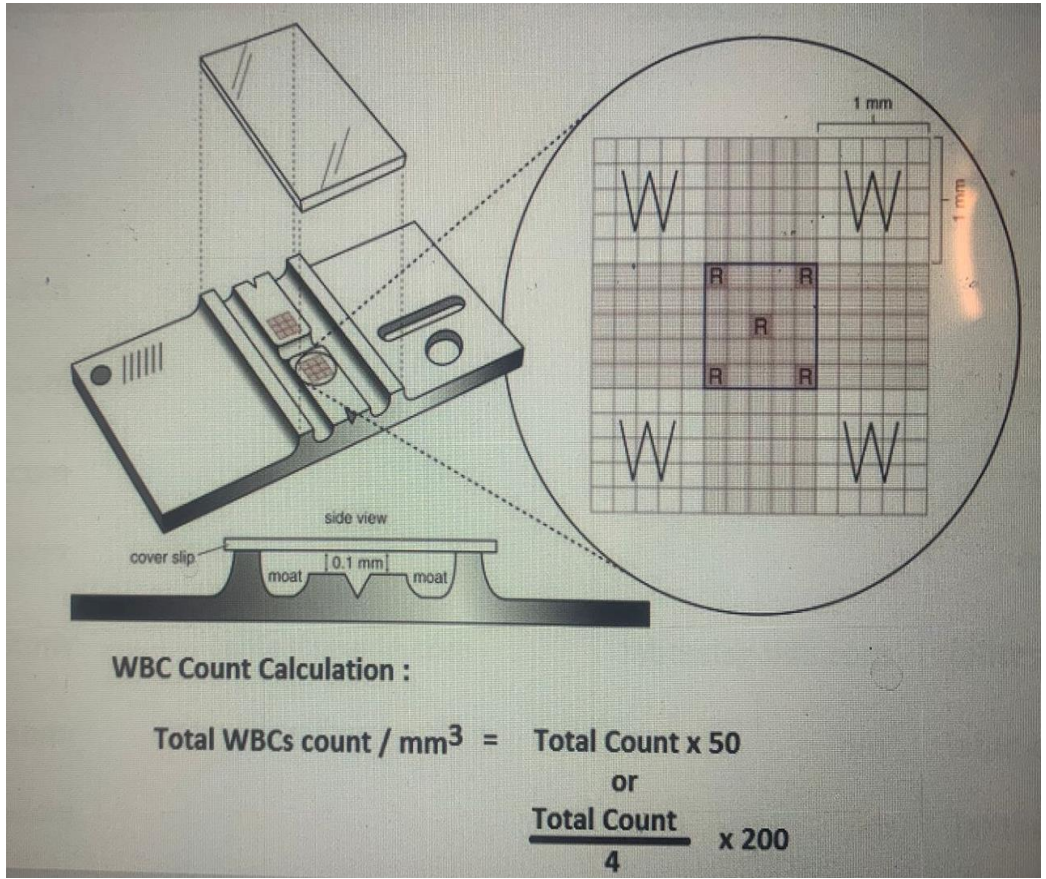
Cells/ mm ^{3} = <u>cells counted x blood dilution x chamber depth</u>

Area of chamber counted

Cells/ mm ^{3} = <u>number of cells counted x 20 x 10</u>

4

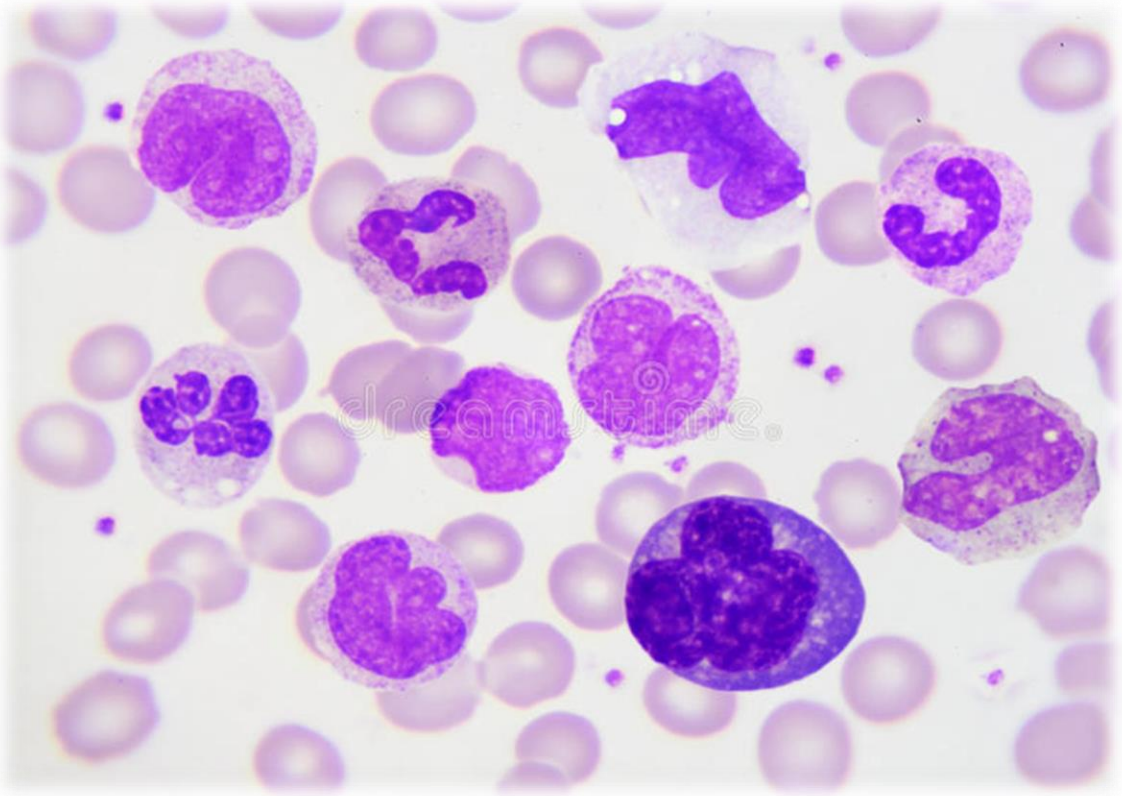
Cells/ mm ^{3} = number of cells counted x 50



Normal range

Total WBC count for:

- Adult = 4000-11000 No. of cell/mm^3
- Children = 4000-25000 No. of cell/mm^3
- Infants = 10000-25000 No. of cell/mm^3



Medical consideration

- **Leukopenia:** A clinical condition known as *leukopenia* occasionally occurs in which the bone marrow produces very **few white blood cells**, leaving the body unprotected against many bacteria and other agents that might invade human body.
- **Leukocytosis:** **Increase number of WBC** in the peripheral blood.
- • **Leukemia :** is a group of malignant disorders of the haemopoietic tissue associated with an increase in the no. of primitive WBCs (blast cell) in the bone marrow and there will be a failure of cell maturation and the accumulation of useless cells which take up the bone marrow space and eventually this proliferation spills into the blood.

Date---------- Worksheet Lab 5 Names of the students:

Group--------

Name of the experiment:

Aim of the experiment:

Materials

Procedure:

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Results

Discussion: