Erythrocyte count

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Clinical Pathology

4th Class

lect. 2

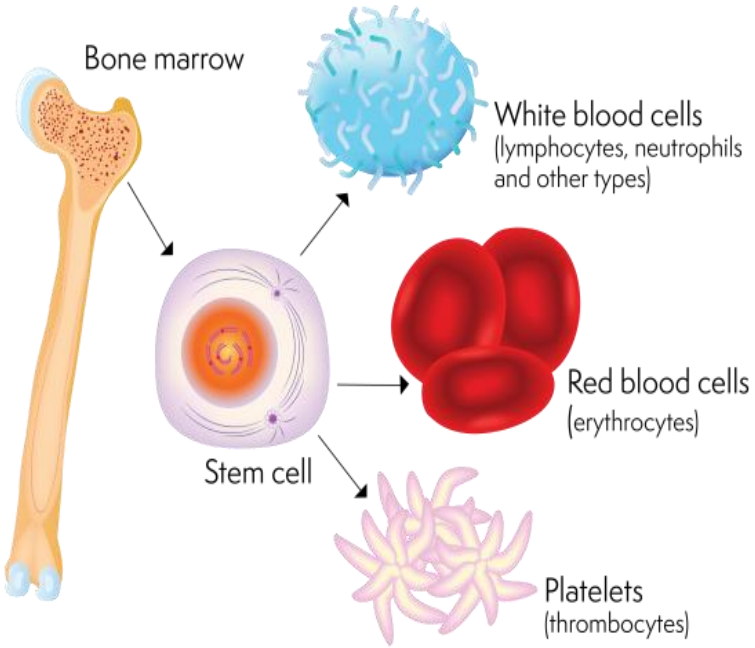
Erythrocytes Morphology

- Mammalian erythrocytes are a nuclear while all other vertebrates have nucleated red cells.
- Goat erythrocytes are the smallest and most variable in shape. Spindle, rod, or sphere-shape red cells may be observed.
- cow and sheep erythrocytes appear bowl-shaped
- camel has elliptical erythrocytes.

Erythropoiesis (Erythrocyte production)

- **In mammals, erythropoiesis occurs in bone marrow parenchyma.**
- **Characteristic morphologic changes occurs during maturation from the Rubriblast to the mature erythrocyte.**

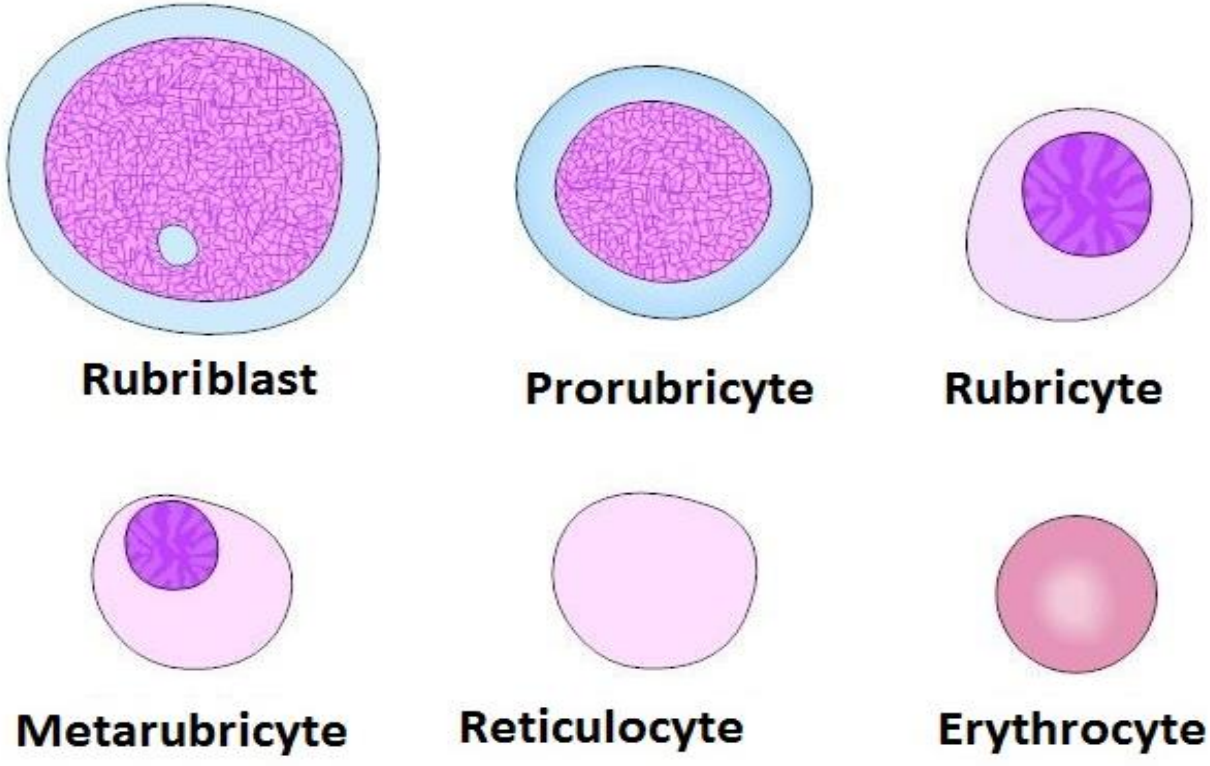
Erythropoiesis(Erythrocyte production)



Sequence of erythropoiesis

1. Rubriblast
2. Prorubricyte
3. Rubricyte
4. Metarubricyte
5. Reticulocyte
6. Erythrocyte

Sequence of Erythropoiesis

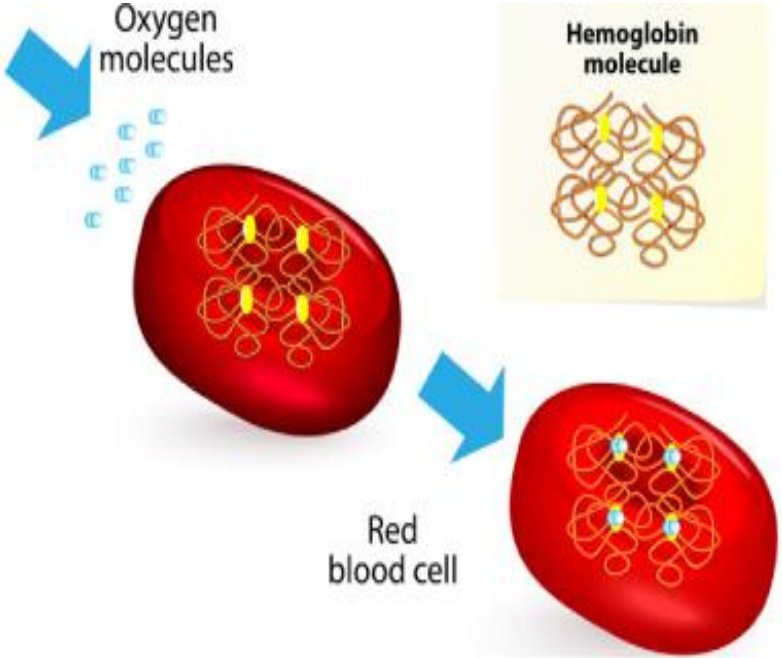


Regulation of Erythropoiesis

- **Erythropoietin (Epo):** The majority of Epo is produced by peritubular interstitial cells of the kidney in response to hypoxia
- **Interleukin-3 (IL-3):** stimulate the multiplication of a primitive erythroid progenitor cell.
- **Androgens:** Increase Epo release.
- **Thyroid and pituitary hormones:** alter the tissue demands for oxygen, thereby changing the requirement for erythropoiesis.

Erythrocyte function

- **The primary function of Erythrocyte is oxygen transport, which is mediated by hemoglobin.**



Objectives of Erythrocyte count

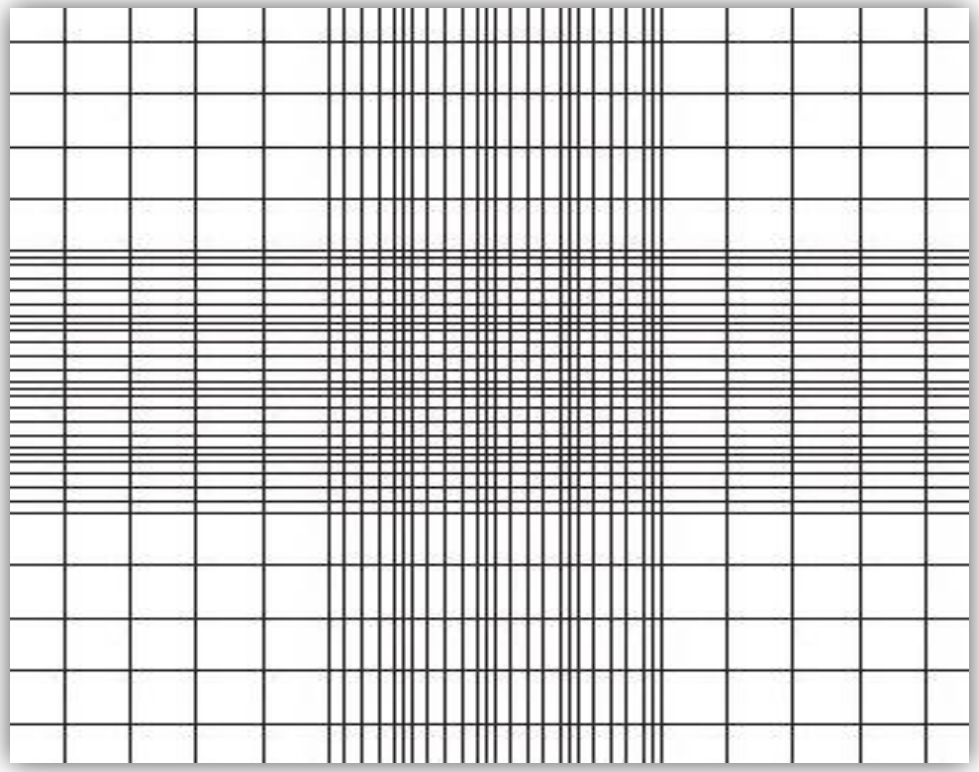
- **A RBC count is ordered as a part of the complete blood picture, often as a part of routine physical, pre-surgical procedures.**
- **The test is repeated in animals with hematological disorders, bleeding problems, anemia and/or polycythemia.**

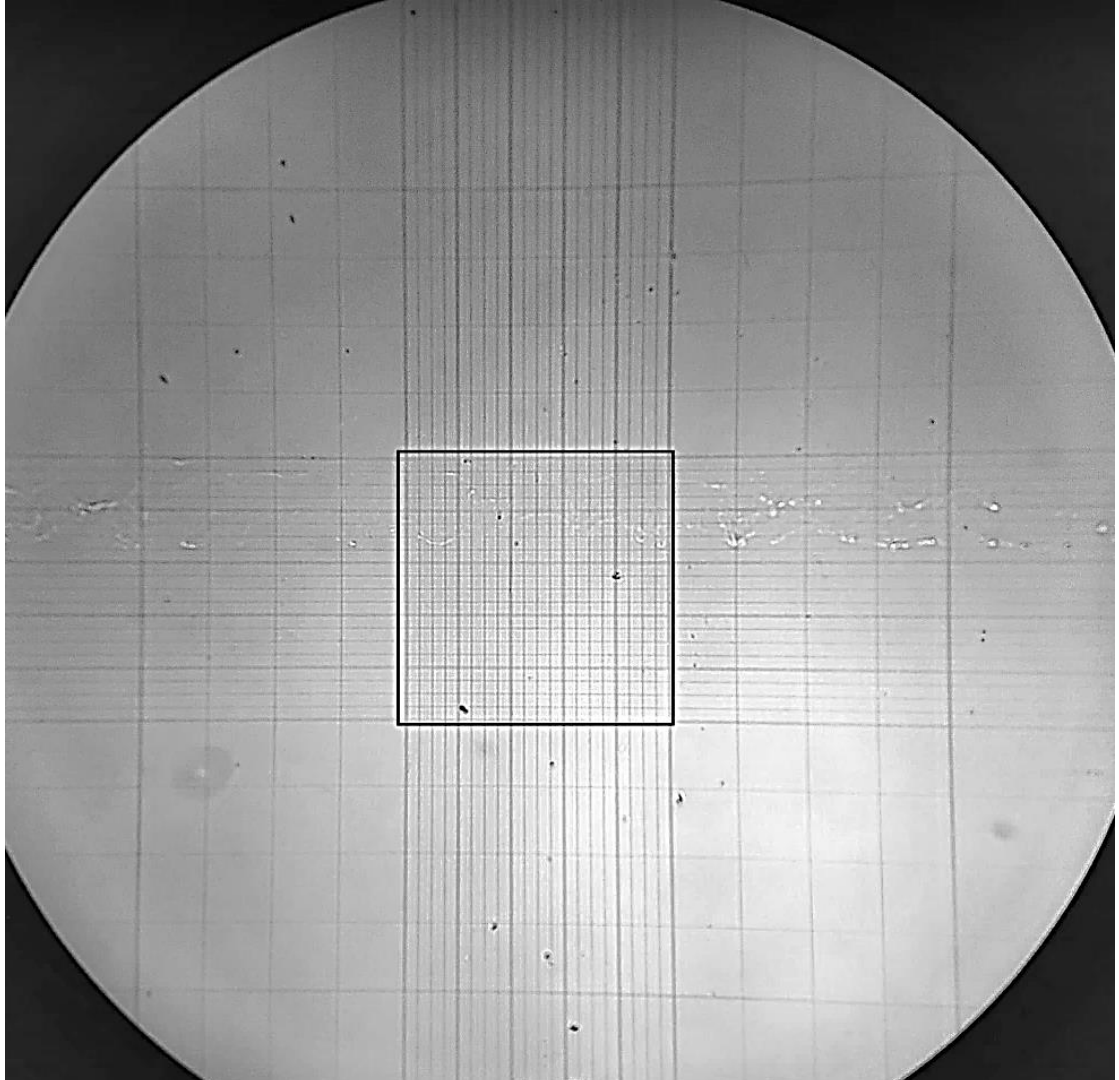
Methods of counting RBC

- **Hemocytometer method**

- **Electronic counting methods**

Hemocytometer Slide





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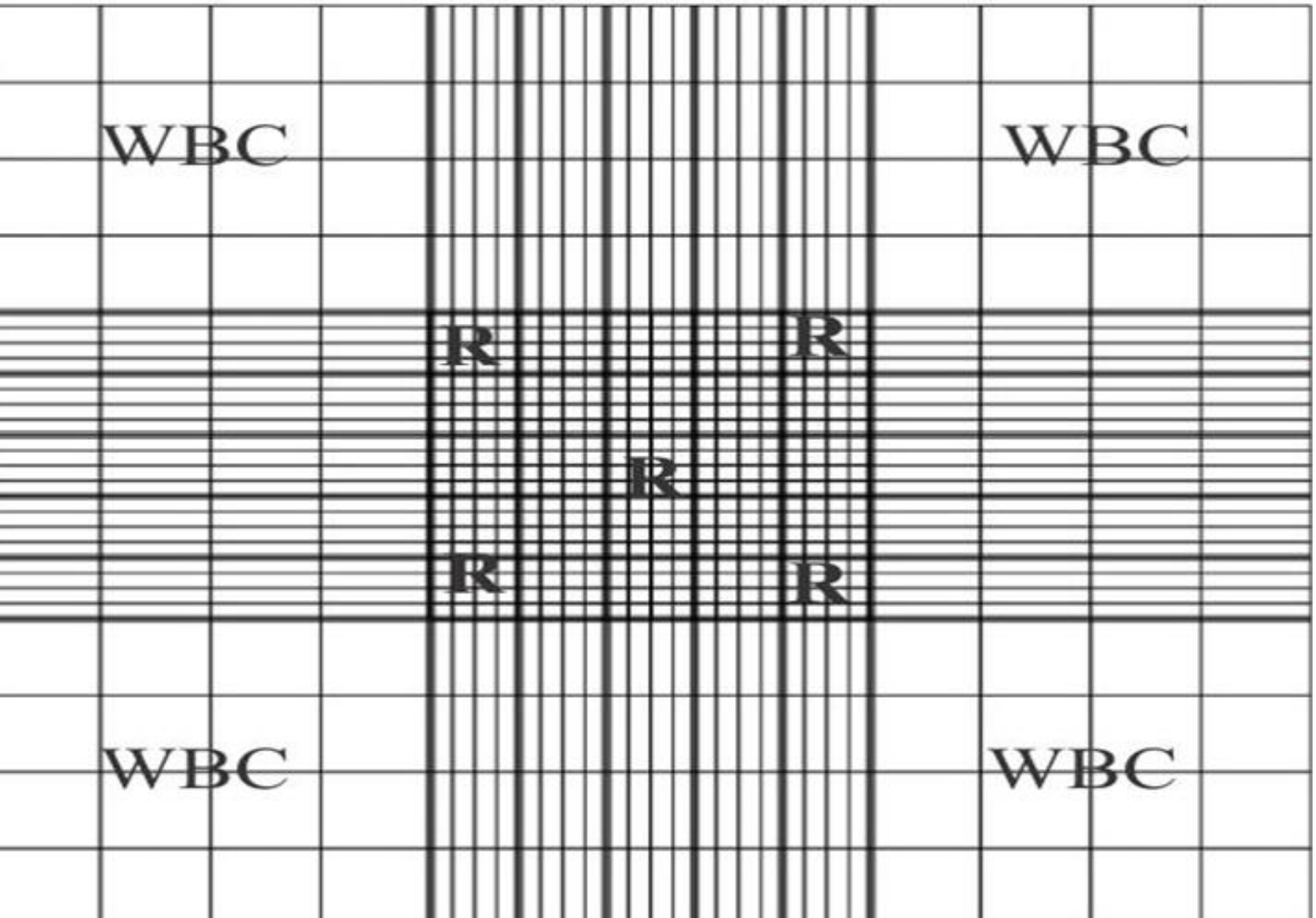

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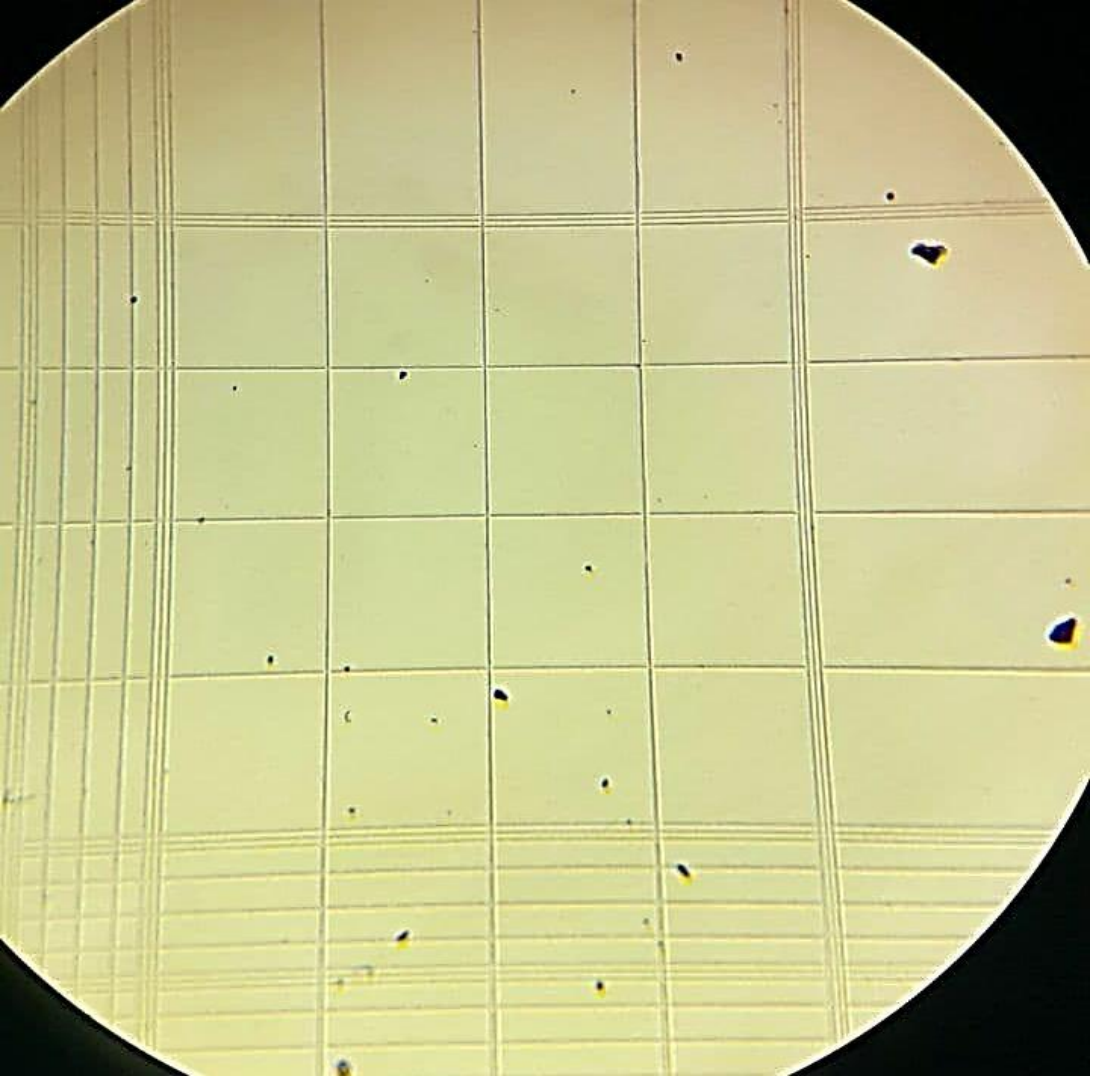
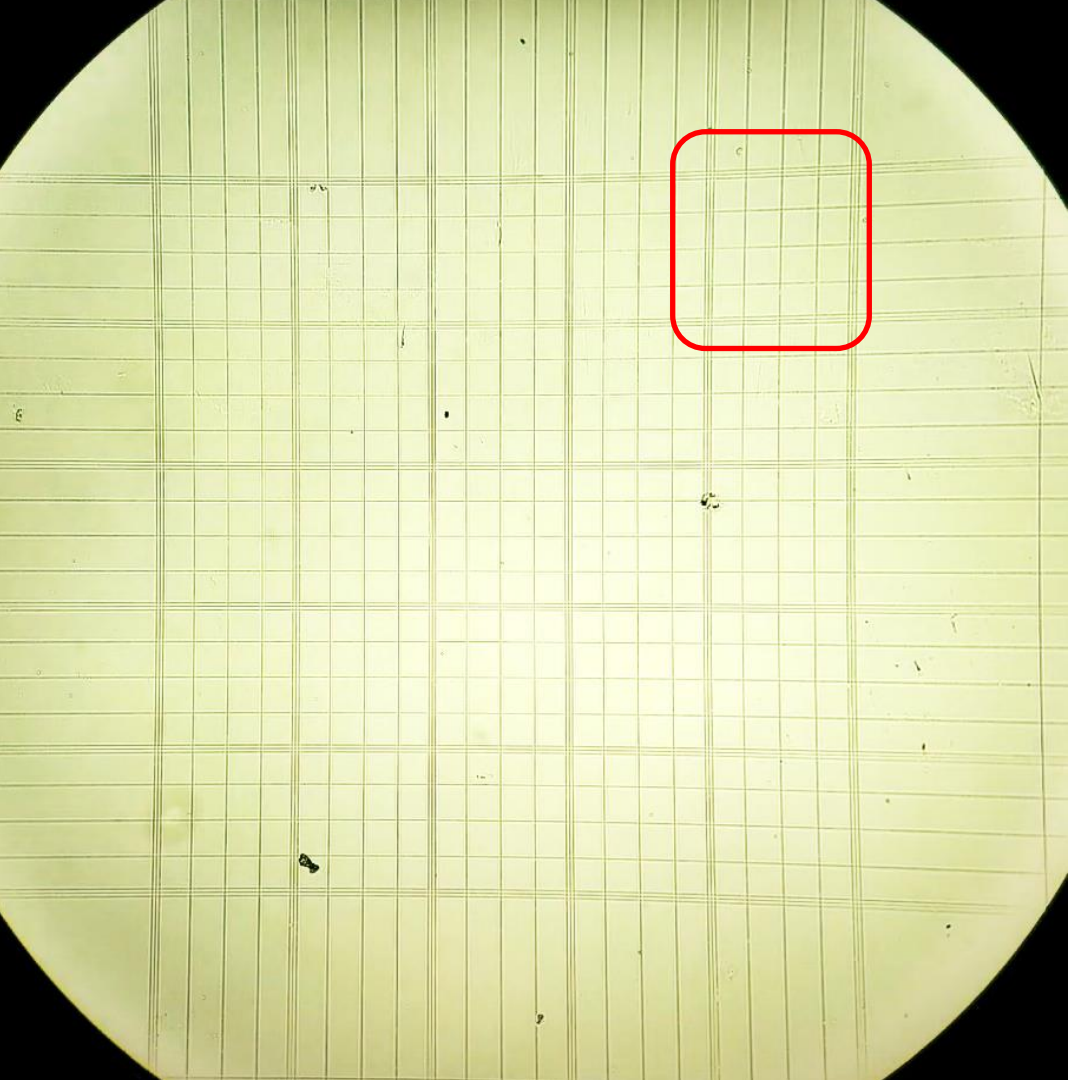


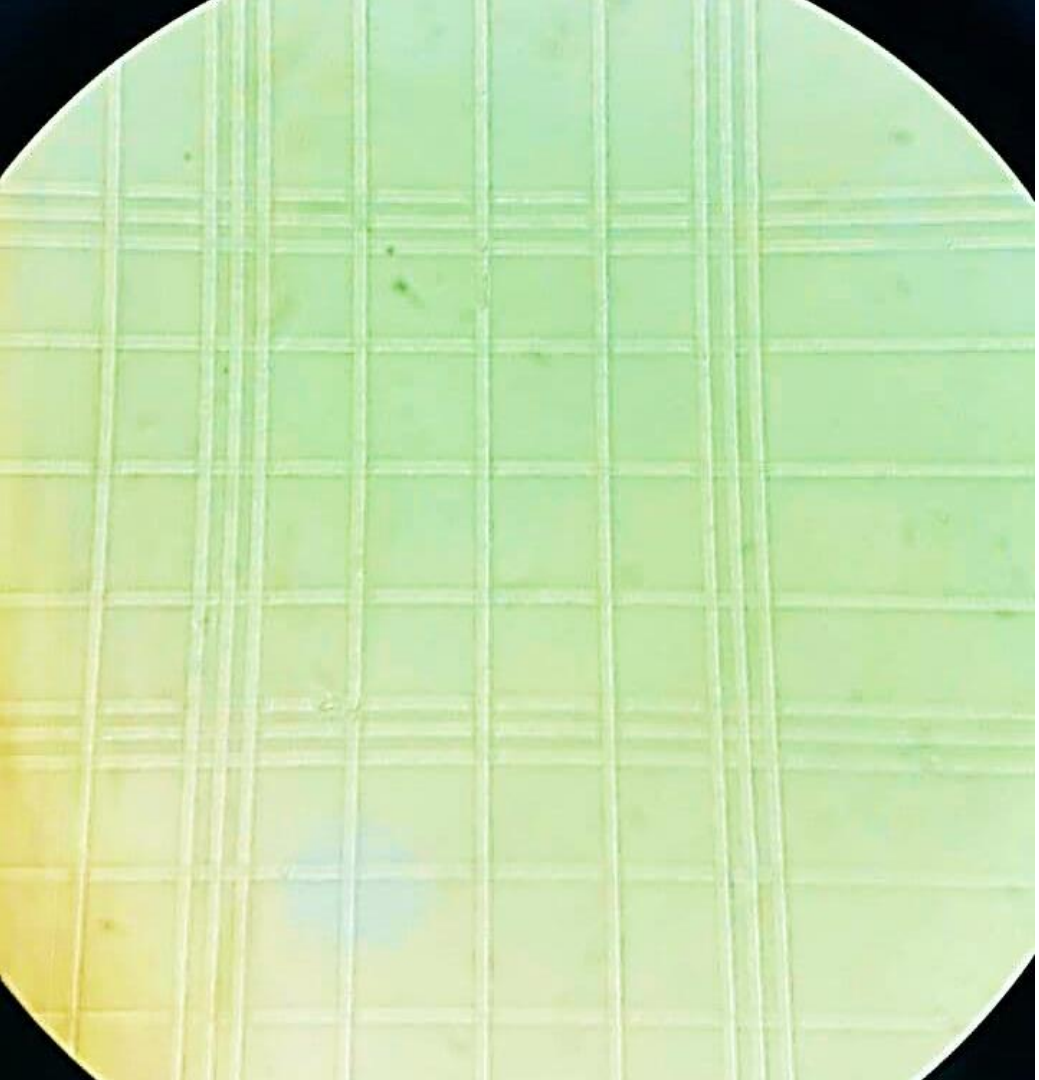
WBC Counting Area

x10



RBC Counting Area

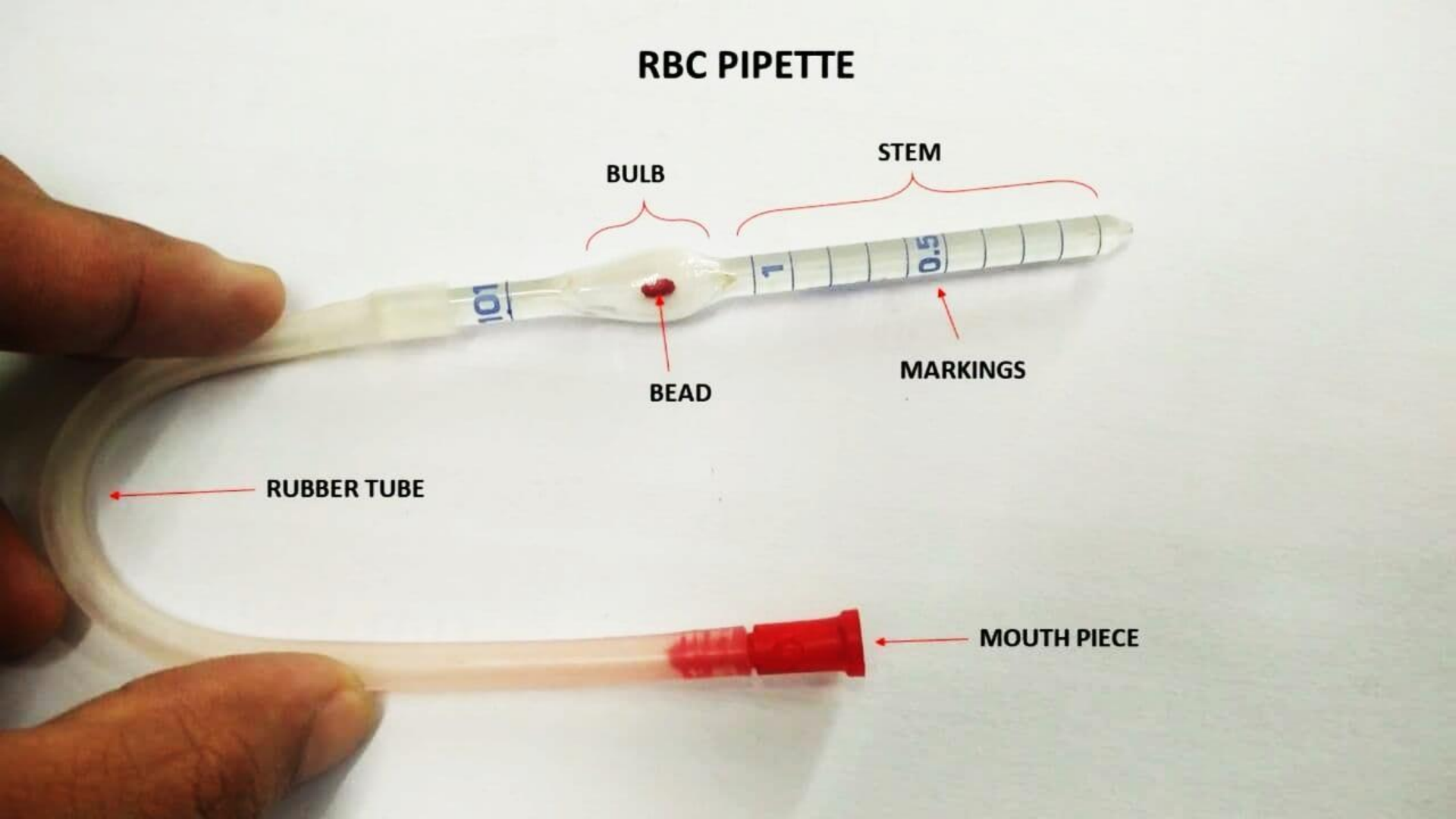
X10



RBC Counting Area

X40

RBC PIPETTE



RBC diluting fluid (Hayem's fluid)

→ Composition and Function:

1. **Sodium Sulphate (2.5 gm) – to prevent aggregation of RBC (i.e. Roulex formation)**
2. **Sodium Chloride (0.5 gm) – maintain isotonicity**
3. **Mercury Chloride (0.25 gm) – Antibacterial, Antifungal and Preservative**
4. **Water (100 ml) – as a Solvent**