

Total White Blood Cell Count

Experiment 15 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

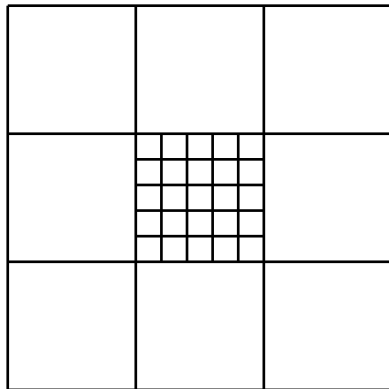
Aim

To calculate a total WBC count from a supervised chamber demonstration or counted teaching image.

Principle

A diluted cell suspension is counted in a known chamber volume. Cell concentration equals counted cells multiplied by dilution factor divided by counted volume.

Chamber Guide



Improved Neubauer chamber

Grid: 3 mm × 3 mm

Each large square: 1 mm²

Chamber depth: 0.1 mm

Central square: 25 groups

Schematic; not to scale.

Requirements

- Improved Neubauer chamber and microscope or calibrated teaching image
- Instructor-provided material and the assigned dilution method

Procedure

1. Identify grid

Locate the four large corner squares in the supplied chamber.

2. Record dilution

Enter the actual dilution used; do not assume it from the instrument name.

3. Count

Count WBCs in the four 1 mm² corner squares using a consistent inclusion/exclusion boundary rule.

4. Calculate

The area is 4 mm² and depth 0.1 mm, so volume is 0.4 mm³ = 0.4 microlitre.

Human Anatomy and Physiology

5. Check

Compare duplicate counts and document any distribution, charging or boundary error.

Observations and Record

Field	Record
Dilution factor	_____
Four-square cell counts	_____
Total cells N	_____
Counted volume	0.4 microlitre
WBC count, cells/microlitre	_____

Worked Example

The numbers below are illustrative; enter your own observations in the record.

- $\text{WBC/microlitre} = N \times \text{dilution factor} / 0.4$.
- Example: $N = 160$ and dilution factor = 20 gives $8,000 \text{ cells/microlitre} = 8 \times 10^9/\text{L}$.

Result

Record the observed outcome and calculated value, with units. State whether the stated laboratory specification was met; do not copy the worked example as your result.

Precautions

- Use the correct coverslip and chamber depth.
- Reject overfilled, uneven or bubble-containing demonstrations.
- Do not identify a disease from a count alone.

Viva Questions and Answers

1. Why multiply by dilution?

The original suspension is more concentrated than the counted dilution.

2. Why is depth needed?

Counted area becomes a known volume only when depth is included.

3. How does total WBC differ from a differential?

Total count measures concentration; the differential describes proportions or absolute counts of types.

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