Differential White Blood Cell Count

Experiment 17 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Aim

To classify white cells in a prepared stained blood-film teaching exercise.

Principle

A differential records the distribution of neutrophils, lymphocytes, monocytes, eosinophils and basophils. Cell morphology, film quality and the counting area affect classification.

Cell Identification Guide

Cell	Main teaching features
Neutrophil	Segmented nucleus; fine cytoplasmic granules
Lymphocyte	Dense round nucleus; variable rim of cytoplasm
Monocyte	Folded / kidney-like nucleus; more cytoplasm
Eosinophil	Often bilobed nucleus; conspicuous eosinophilic granules
Basophil	Dark coarse granules can obscure the nucleus

Requirements

- Instructor-prepared stained blood film or validated digital images
- Microscope / display and tally sheet

Procedure

1. Assess film

Locate a suitable monolayer region and avoid thick edges or damaged areas.

2. Identify cells

Classify cells by nuclear form, size, cytoplasm and granules; use the supplied morphology guide.

3. Count systematically

Follow the assigned traverse pattern and tally the specified number, commonly 100 teaching cells.

4. Calculate proportions

Percentage = type count / total classified × 100; the total should be 100%.

5. Calculate absolute counts

When total WBC is supplied, absolute type count = total WBC × fraction of that type.

Observations and Record

Type	Tally / count	Percentage
Neutrophils	_____	_____
Lymphocytes	_____	_____
Monocytes	_____	_____
Eosinophils	_____	_____
Basophils	_____	_____

Worked Example

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

- Hypothetical exercise: 60 neutrophils out of 100 cells = 60%.
- If supplied total WBC is 8,000/microlitre, absolute neutrophils = 8,000 × 0.60 = 4,800/microlitre.

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 prepared slides rather than unsupervised specimen preparation.
- Do not classify damaged cells with confidence; seek instructor review.
- Percentages and absolute counts answer different questions.

Viva Questions and Answers

1. Which cells commonly have a multilobed nucleus?

Neutrophils.

2. Which commonly have prominent orange-red granules?

Eosinophils in an appropriate stain.

3. Why calculate absolute counts?

A normal-looking percentage can coexist with an abnormal total concentration.

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