

Practical Session N°4: Observation of Cellular Organelles under the Microscope

Objectives

- Learn how to prepare slides for microscopic observation.
 - Identify the main cellular organelles visible under an optical microscope.
 - Compare the cellular structures of plant and animal cells.
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Required Materials

1. Optical microscope.
 2. Slides and coverslips.
 3. Biological stains (methylene blue, methyl green, iodine solution, neutral red).
 4. Pasteur pipettes.
 5. Distilled water.
 6. Filter paper or blotting paper.
 7. Scalpel or razor blade.
 8. Fine forceps.
 9. Specimens for observation:
 - **Plant cells:** onion skin, epidermis of Elodea leaf or other aquatic plants.
 - **Animal cells:** buccal cell smear.
 - Yeast cells.
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Procedure

1. Observation of the Nucleus (Animal Cells)

- **Preparation:**
 - Gently collect buccal cells using a cotton swab or a clean slide edge.
 - Place the cells on a slide and add one drop of methylene blue.
 - Carefully cover with a coverslip, avoiding air bubbles.
- **Observation:**
 - Observe under the microscope at low magnification (10x), then increase to 40x.
 - Identify the nucleus, which will appear dark blue.

2. Observation of Chloroplasts (Plant Cells)

- **Preparation:**
 - Take a small piece of Elodea leaf or onion skin.
 - Place the fragment on a slide with a drop of distilled water.

- Cover with a coverslip and blot excess water with filter paper.
- **Observation:**
 - Observe under the microscope. Chloroplasts appear as green oval structures.

3. Observation of Mitochondria (Special Staining)

- **Preparation:**
 - Use yeast cells or buccal cells.
 - Add a drop of neutral red, a stain that highlights mitochondria.
 - Cover with a coverslip.
- **Observation:**
 - Look for small red dots dispersed in the cytoplasm.

4. Observation of Vacuoles (Plant Cells)

- **Preparation:**
 - Prepare a slide with a piece of onion skin and add a drop of iodine solution (Lugol's iodine).
 - Cover with a coverslip.
- **Observation:**
 - Vacuoles appear as clear structures in the cytoplasm, surrounded by stained cell walls and nuclei.

Analysis and Interpretation

1. Draw annotated diagrams for each type of cell observed.
 2. Compare the structures of animal and plant cells (e.g., presence of a cell wall, chloroplasts, and vacuole in plant cells; absence of these organelles in animal cells).
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