



Observing Mitosis in Onion Root Tip Cells

Under the Microscope

Name: _____

Date: _____

Lesson: _____

GOAL: To observe and identify the stages of mitosis in onion root tip cells.
Mitosis is the process where one cell divides to make two identical daughter cells.



MATERIALS

- Onion (with roots)
- Scissors
- Forceps or tweezers
- Glass slides
- Cover slips
- Dropper or pipette
- Distilled water
- Hydrochloric acid (HCl) – 1N (or vinegar as a mild alternative)
- Stain: Iodine (IKI) or Aceto-orcein
- Paper towels
- Microscope



PROCEDURE

1. **Grow onion roots:** Place an onion bulb over a jar of water so the roots hang down into the water. Let the roots grow 2–5 cm long.
2. **Cut root tips:** Cut 5–10 mm from the ends of healthy root tips.
3. **Soften the cells:** Place the root tips in 1N HCl (or vinegar) for 5 minutes to soften the tissue.
4. **Rinse:** Rinse the root tips in distilled water.
5. **Stain:** Place the root tips in iodine (IKI) or aceto-orcein stain for 5–10 minutes.
6. **Prepare the slide:**
 - Place one root tip on a clean slide.
 - Add 1–2 drops of stain.
 - Gently place a cover slip on top.
7. **Squash the cells:** Tap the cover slip gently with a pencil eraser or the end of a pencil to spread the cells into a thin layer.
8. **Observe:** Start on low power to find the root tip area, then switch to high power to observe cells. Look for different stages of mitosis.



SAFETY FIRST

- Hydrochloric acid is corrosive. Wear gloves and eye protection if available.
- Work in a well-ventilated area.
- Handle glass slides and cover slips carefully.
- Wash hands after the experiment.

STAGES OF MITOSIS (What to Look For)

INTERPHASE



Nucleus is intact.
Chromatin is loose
and thread-like.

PROPHASE



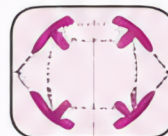
Chromosomes condense
and become visible.
Nuclear membrane
begins to break down.

METAPHASE



Chromosomes line up
across the center
of the cell.

ANAPHASE



Sister chromatids
separate and move
to opposite ends.

TELOPHASE



Nuclei reform around
each set of chromosomes.
Cell divides.

OBSERVATION TABLE

Record the number of cells you observe in each stage.

Interphase	Prophase	Metaphase	Anaphase	Telophase	Total Cells Observed

ANALYSIS & QUESTIONS

1. Which stage of mitosis did you see the most? _____
2. Which stage did you see the least? _____
3. Why do you think most cells were in interphase? _____
4. How is mitosis important for living things? _____

DRAW WHAT YOU SAW

Sketch a cell in one stage of mitosis
that you observed.