

LAB: Observing Living Cells

Ever since the first microscope was used, biologists have been interested in studying the cellular organization of all living things. After hundreds of years of observations by many biologists, the **cell theory** was developed. Eukaryotic cells contain structures called organelles that carry out life processes. Eukaryotic cells can be classified by the types of organelles they contain. In plant and animal cells, similarities and differences exist because of varied life functions.

→Record all background research, sketches and data in your lab notebook.

Background Research:

1. List the 3 parts of the Cell Theory
2. What is the difference between prokaryotes and eukaryotes?
3. Describe or define each of the following
 - cell membrane
 - cytoplasm
 - nucleus
 - organelle

Materials:

- Microscope, microscope slides & coverslips
- Water
- cell stains: iodine & blue food coloring solution
- yogurt
- onion
- colored pencils
- forceps
- toothpicks

PROCEDURES: Make wet-mount slides of the available cell types. You may do them in any order.

REMEMBER:

- Look around on LOW power (4X); go up to MEDIUM(10X) or HIGH (40X) when you've found something.

- It may take two or three tries at a slide before you get a good preparation!
- Adjust fine focus to see one layer of cells (especially if viewing plant tissue).
- Draw ONLY what you see, and LABEL the MAGNIFICATION and structures you recognize! Record observations too.

Human Cheek Cells:

1. Put a drop of blue food coloring solution on a slide.
2. Gently scrape the inside of your cheek with the flat side of a toothpick. Scrape lightly.
3. Stir the end of the toothpick in the stain and throw the toothpick away.
4. Place a coverslip onto the slide.
5. Use the LOW (4X) objective to focus. You probably will not see the cells at this power.
6. Switch to MEDIUM power (10X). Cells should be visible, but they will be small and look like nearly clear blue blobs. If you are looking at something very dark blue, it is probably not a cell. Sketch and label in your lab notebook.
7. Once you think you have located a cell, switch to high power and refocus. (Remember, do NOT use the coarse adjustment knob at this point). Sketch and label in your lab notebook.

Onion Cells:

1. Remove a scale from the onion.
2. Snap the scale in half and peel a thin layer of tissue from its inner surface.
3. Make a wet-mount (add 1 drop of water) of a piece of this tissue. Smooth out any "wrinkles."
4. STAIN with a drop of iodine stain, as demonstrated by the teacher.
5. Put on a cover slip; be sure to angle the cover slip to avoid air bubbles.
6. Locate cells on LOW power and then bring up to MEDIUM power and then HIGH power.
7. Observe, draw, and label. Be sure to label any parts you see. You may be able to see: cell wall, nucleus, and cytoplasm.

Yogurt Bacteria Cells

1. Place a dab of yogurt on a microscope slide.
2. Mix this yogurt with a drop of water, place a coverslip on top, and place the slide under the microscope.
3. Focus the microscope under high power.
4. Observe, draw, and label.
5. Data Table 1: Observations
6. Summarize the cell parts that were visible for each cell type.

→ In your lab notebook, complete the following data table and answer these questions:

Cell Type	Structures Observed
Onion Cells	
Human cheek cell	
Yogurt Bacteria	

Questions:

1. Why are stains such as iodine used when observing cells under the microscope?
2. What is the general shape of a plant cell (onion)? Explain why.
3. If you were given a slide containing living cells of an unknown organism, how would you identify the cells as either plant or animal?
4. What shape are yogurt bacteria?
5. What structures are found within the cells of eukaryotes that are not found within prokaryotes?
6. How does the structure of the prokaryotic cells (yogurt bacteria) compare to the eukaryotic cells (onion & cheek cells)? How are they similar? Different? Use a Venn diagram to compare and contrast.