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Microscopic observation of cell structures

Microscopic observation is essential for studying cells because most cell structures are too small to be seen with the naked eye. Using microscopes—especially **light microscopes** and **electron microscopes**.

Types of Microscopes

- **Light Microscope (Optical)**
 - Uses visible light
 - Magnification up to ~1000x
 - Suitable for observing live cells and basic structures
 - **Electron Microscope**
 - Uses electron beams
 - Much higher resolution
 - Reveals fine details like organelles and membranes
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Common Cell Structures Observed

1. Cell Membrane

- Thin outer boundary of the cell
- Controls movement of substances in and out

2. Nucleus

- Large, often visible structure
- Contains DNA and controls cell activities

3. Cytoplasm

- Jelly-like substance filling the cell
- Site of many metabolic reactions

4. Cell Wall (in plant cells)

- Rigid outer layer

- Provides shape and support

5. Chloroplasts (in plant cells)

- Green structures containing chlorophyll
- Site of photosynthesis

6. Vacuole

- Storage structure (very large in plant cells)
 - Maintains cell pressure
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Examples of Microscopic Observations

- **Onion epidermal cells**
 - Rectangular shape
 - Clear cell wall and nucleus
 - **Human cheek cells**
 - Irregular shape
 - Visible nucleus, no cell wall
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Basic Steps for Observation

1. Prepare a thin sample (slide)
 2. Add stain (e.g., iodine or methylene blue) to enhance visibility
 3. Place a cover slip
 4. Focus under low magnification, then increase gradually
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Key Notes

- Staining improves contrast and helps identify structures
- Magnification shows size, while **resolution** determines clarity
- Proper lighting and focus are critical for clear observation



Materials

- Light microscope

- Glass slides and cover slips
- Onion
- Cotton swab (for cheek cells)
- Distilled water
- Iodine solution (for plant cells)
- Methylene blue stain (for animal cells)
- Dropper

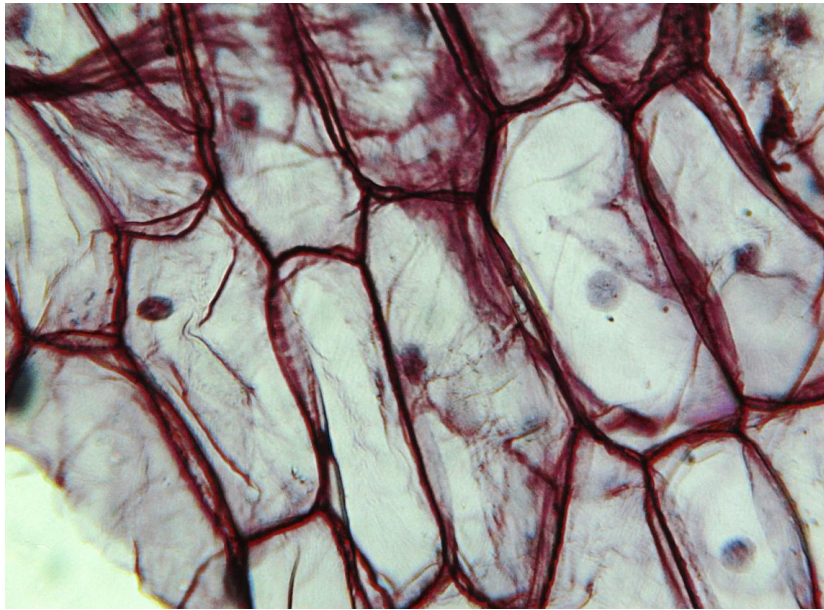


Figure 1 – microscopic view of onion cell

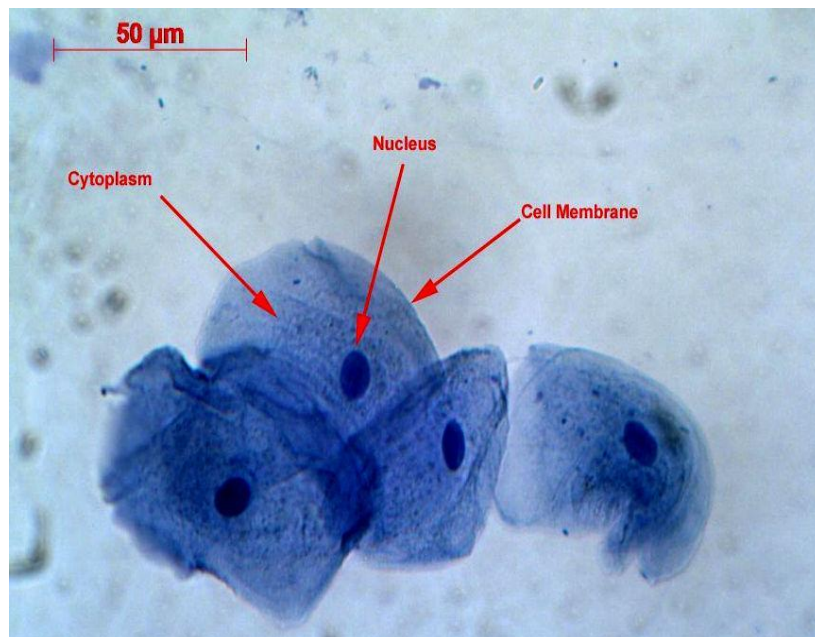


Figure 2 – human cheek cell under microscope