

Chapter 4 cell structure and function

Objectives

1. Draw an animal cell and label their parts and function.
2. Draw a plant cell and label their parts and function.
3. Investigate and draw an onion cell (plant) and a cork cell.
4. Stain an onion cell (plant) using iodine and identify & draw a nucleus
5. Investigate and draw a human cheek cell.
6. Investigate and draw three different types of protists
7. Draw an animal cell and label its parts then write or draw how protein is synthesized in the cell.
8. Observe and draw animal, plant, and protozoan cells.
9. Draw a prokaryotic cell and write the difference between a prokaryotic cell and an eukaryotic cell.
10. Draw the cell membrane showing all different parts in the cell membrane.

Chapter 4 notes

Term – cell (basic unit of life)

Robert Hooke first coined the term “cell” using a light microscope.

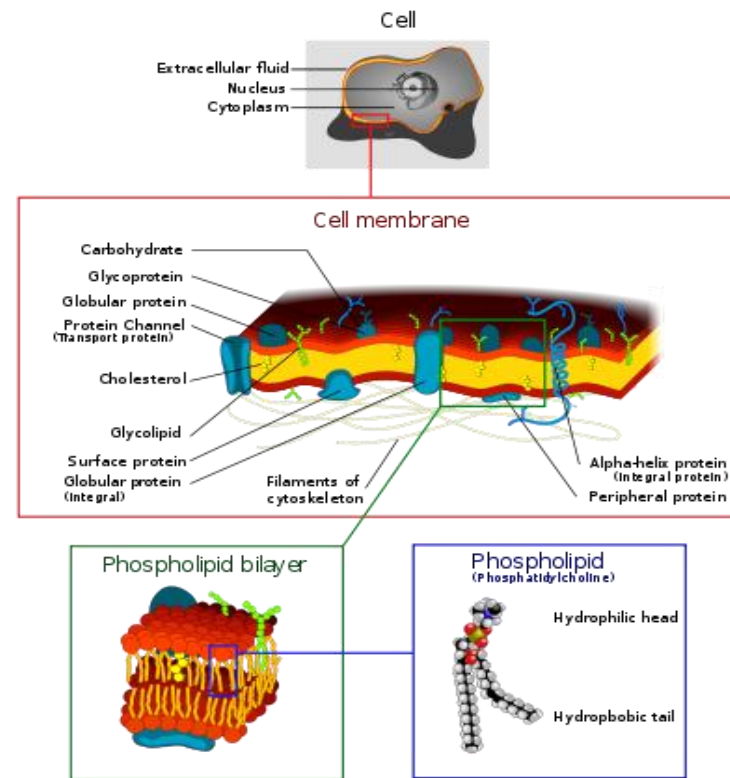
Leewenhoek further developed microscope and studied living cells and coined the term “animalcules” or not we call “protists (Eukaryotic cells belonging to Kingdom Protista – mostly single celled. Some are animal like - protozoan, some are plant like -algae, and some are fungus like – slime mold and water molds).

The Cell Theory states:

- All living organisms are composed of cells. They may be unicellular or multicellular.
- The cell is the basic unit of life.
- Cells arise from pre-existing cells.

Basic parts of a cell

Cell membrane (plasma membrane) – phospholipid bilayer (fluid mosaic model) hydrophilic head and hydrophobic tails. Membrane protein.



Cytoplasm

Control center (nucleus) – nuclear membrane/envelope, nucleolus, DNA/chromosome

Mitochondria w/DNA

Endoplasmic reticulum (rough/smooth)

Ribosome

Golgi apparatus (package protein and lipids)

Lysosome (vesicle produced by budding off of golgi apparatus) -In liver, breaks down glycogen to release glucose. Certain white blood cells use it to break down bacteria. Within a cell, it can digest worn out organelles (Autophagy) and it can digest cell itself (autolysis)

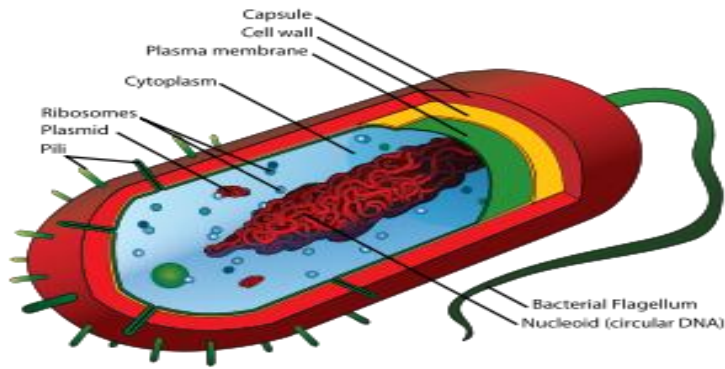
Peroxisomes (just like lysosome but contains different enzyme. i.e. release H₂O₂ when breaking down alcohol and killing bacteria.

Cytoskeleton – a network of tubes and filaments that crisscrosses to give shape to the cell from the inside like a tent poles. (microtubules, microfilaments, and intermediate filaments)

Protein Synthesis – DNA to golgi bodies

Two Basic Types of Cells

Prokaryotes – organisms that lack membrane bound nucleus and membrane bound organelles. Cilia and Flagella used for movement



Eukaryotes – Nucleus present with membrane bound organelles. Bigger than prokaryotes and have specialized cells that depend on each other

Cell → Tissue (group of similar cells carrying out a specific function) → Organ (group of tissues) → organ system (group of organs).

Plant cell and Animal Cell

Animal Cell – centriole (two short cylinders of microtubes at right angles to each other and are situated near the nucleus).

Plant cell – Plastids (like mitochondria are surrounded by a double membrane and contain their own DNA)

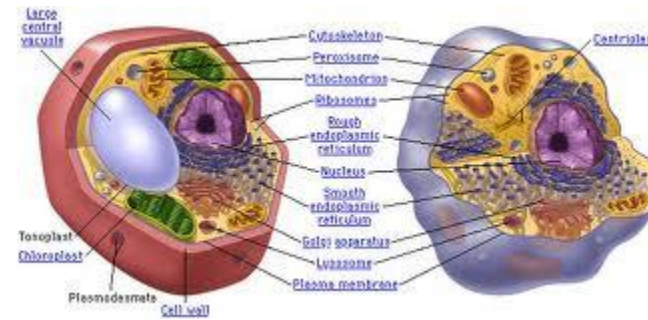
a. **Chloroplast:** Photosynthesis. Contains thylakoids which contains chlorophyll.

b. **Chromoplast:** Colorful pigment may or may not involved in photosynthesis. i.e. carrot root cells (carotene pigment)

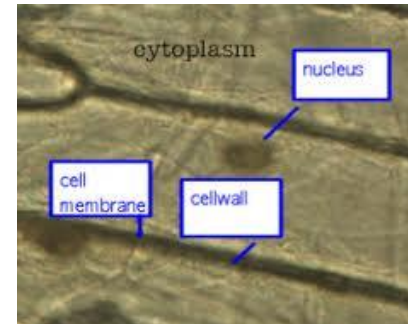
c. **Other plastids:** amyloplasts stores starch.

- Cell Wall

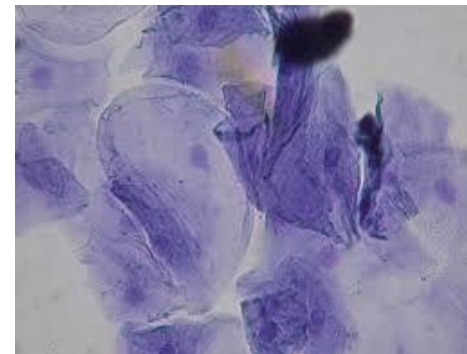
- Central Vacuole



Onion cell (iodine)



Cheek cell (methylene blue)



Elodea

Elodea Leaf - Plant Cell

1,000 Magnification

