

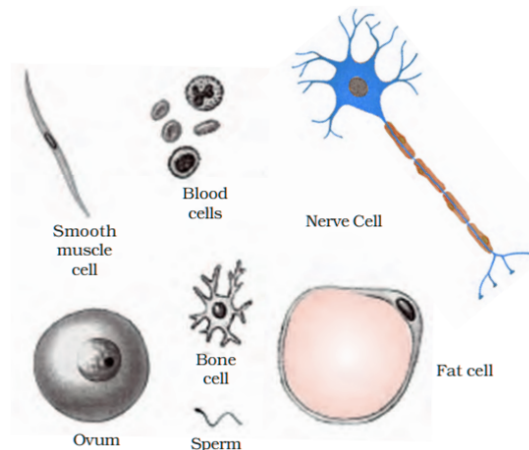
CHAPTER 5 FUNDAMENTAL UNIT OF LIFE CELL

Cell

It is a basic, structural and functional unit of life. First discovered by Robert hook in 1665.

Cell theory

- All living things are composed of cell.
- Cells are the basic unit of structure and function in living things.
- New cells are produced from existing cells.

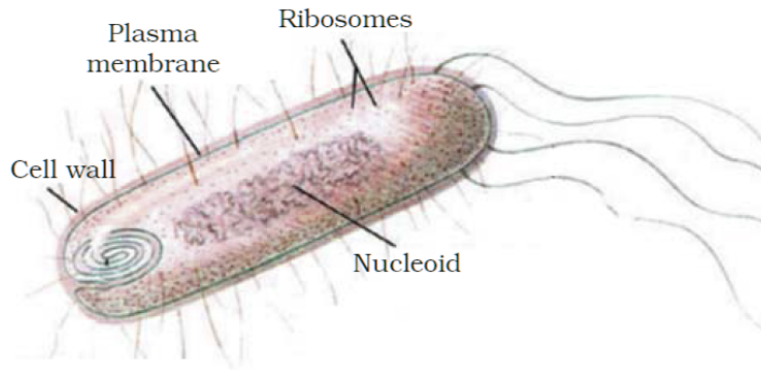


Types of organisms on the basis of number of cells

Unicellular organisms	Multicellular organisms
1. Made of one cell	1. Made of more than one cell
2. Single cell performs all life function (eat, reproduce, rid waste, move)	2. Specialized cell performs different life function (nerve cells)
3. Example – amoeba, bacteria	3. Example – humans.

Types of cells

Prokaryotic cell	Eukaryotic cell
Size generally small (1 – 10 μm) $1\mu\text{m} = 10^{-6}\text{m}$	Size generally large (5 – 100 μm)
Nuclear region: Nucleus is not well defined and known as nucleoids	Nuclear region: well, define and surrounded by a nuclear membrane
Single chromosome	More than one chromosome
Membrane bound cell organelles absent	They have membrane bound organelles



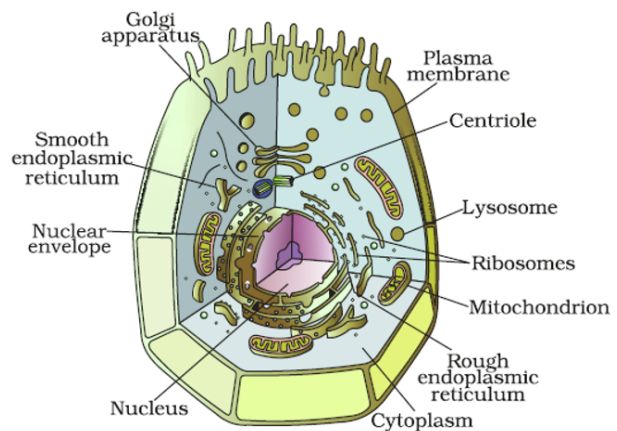
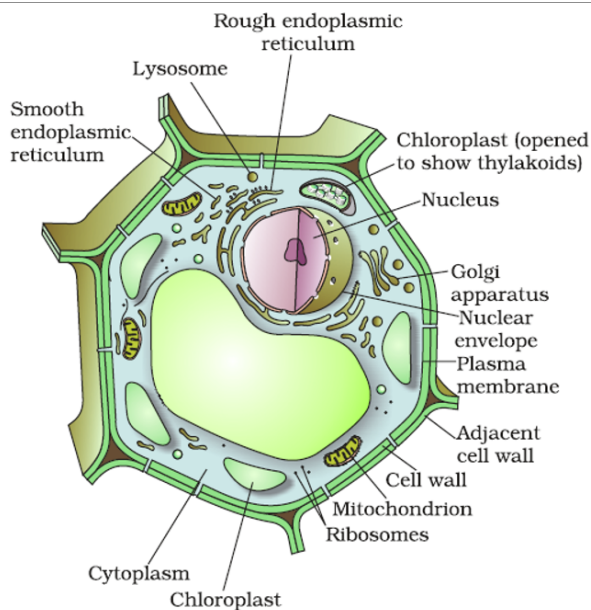
Living organisms

Prokaryotes	Eukaryotes
Oldest cell type small and simple	Evolve from prokaryotes, larger and more complex.
lack nucleus	Contain nucleus
lack organelles	Contain organelles
single cells	Single cells or multicellular

- Both have DNA, have ribosomes, have cytoplasm, have plasma membrane.

Eukaryotes

Plant cell	Animal cell
Cell wall present	Cell wall absent
Plastid's present	Plastids absent
They have large central vacuole	They have small vacuole



Nucleuses

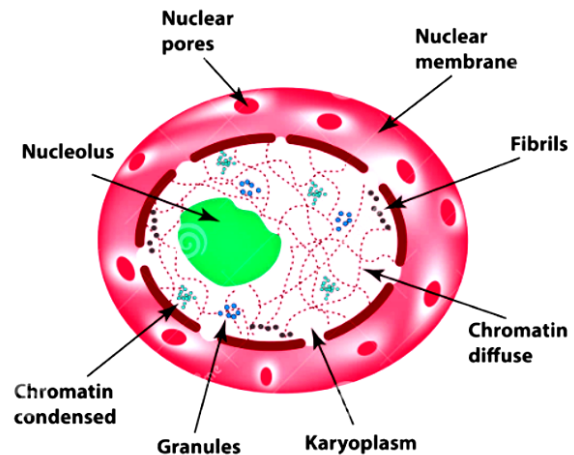
- It was discovered by Robert brown.
- They are also called brain of the cell

Structure

- Double membrane (nuclear envelope)

Function

- Control center of the cell.
- Store hereditary information (DNA).
- Makes RNA and protein.
- Makes ribosomes (nucleolus)



The nucleus contains chromosomes, which are visible as rod shaped structure only when the cell is about to divide. Chromosomes contain information for inheritance of features from parents to next generation in the form of DNA (Deoxyribose nucleic acid) molecules.

Cell wall

Function

Provides support and protection for the cell.

Structure

- Lies outside the cell membrane
- Found in plant, algae, fungi and many bacteria.
- Not found in animal cell.

Plasma membrane or cell membrane

Function

Physical barrier for the cell, separates internal and external environments, selective permeability.

Location

Surrounding the cell, outer surface

Cytoplasm

Structure

- Fluid between cell membrane and organelles.
- Contain water, salt, organic compounds.

Function

- Aids in movement

Semi permeable membrane

Example - plasma membrane

Osmosis

The process of movement of water inside or outside the cell through P.M. (S.P.M.)

Diffusion

The process of movement of substances inside or outside the cell through P.M. (S.P.M.). Example - oxygen, carbon dioxide, etc.

Hypotonic, hypertonic and isotonic solution

Plasmolysis

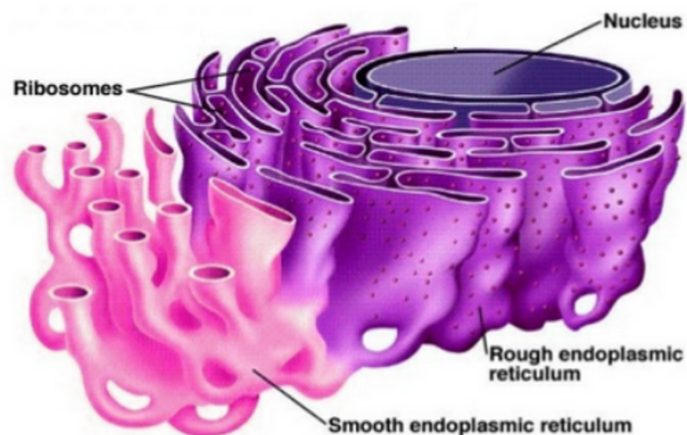
Plasmolysis is the shrinking of the cytoplasm of a plant cell in response to diffusion of water out of the cell and into a high salt concentration solution. During plasmolysis, the cell membrane pulls away from the cell wall.

Some important cell organelles

1. Endoplasmic reticulum
2. Golgi apparatus
3. Lysosomes
4. Mitochondria
5. Plastids
6. Vacuoles

Endoplasmic reticulum

The endoplasmic reticulum (ER) is a large network of membrane bound tubes and sheets. It looks long tubular or oblong bags (vesicles).





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