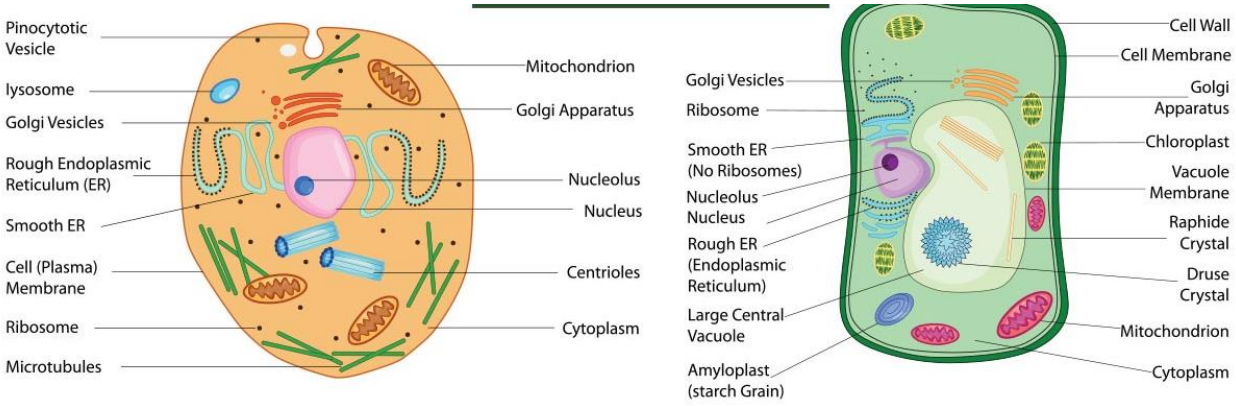
CBSE
Class- 7
Sub- Science
Revision Notes
CHAPTER – 7
HABITAT: LIVING ORGANISMS AN THEIR SURROUNDINGS

What is a Cell?

A cell is the basic structural and functional unit of living organisms.

It is the smallest unit of life.

Cells combine to form tissues, organs, and organ systems in multicellular organisms.



Discovery of Cells

The discovery of cells was made by Robert Hooke in 1665 when he observed a thin slice of cork under a microscope and saw small box-like structures, which he named "cells."

Anton van Leeuwenhoek later discovered single-celled organisms such as bacteria.

Types of Cells

Prokaryotic cells: Cells that do not have a defined nucleus. Example: Bacteria.
Eukaryotic cells: Cells that have a well-defined nucleus and membrane-bound organelles. Example: Plant and animal cells.

Parts of a Cell

A. Cell Membrane (Plasma Membrane)

The outermost boundary of the cell.
It controls the movement of substances in and out of the cell.
Made of a lipid bilayer with proteins embedded in it.

B. Cytoplasm

Jelly-like substance that fills the cell.
It contains various organelles, and chemical reactions necessary for life occur here.

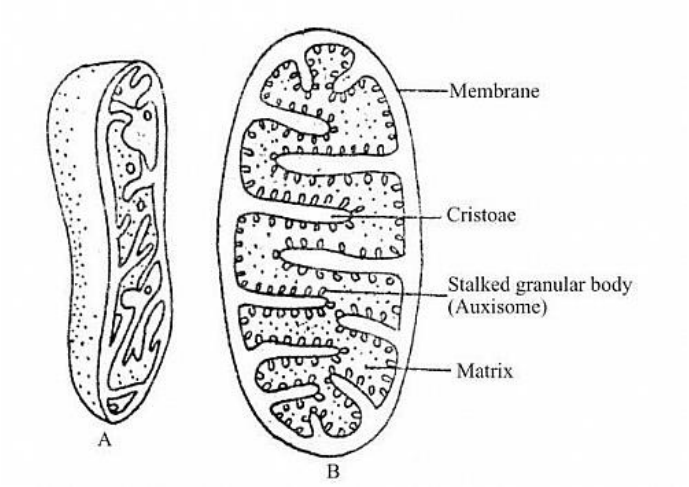
C. Nucleus

The control center of the cell.
Contains DNA, which carries genetic information.
Surrounded by a nuclear membrane with small pores to allow the passage of materials.
Inside the nucleus is the nucleolus, which produces ribosomes.

D. Mitochondria

Known as the "powerhouses" of the cell.
Responsible for producing energy in the form of ATP through cellular respiration.

Contains its own DNA and can reproduce within the cell.



Organelles in Eukaryotic Cells

A. Endoplasmic Reticulum (ER)

A network of membranes involved in the synthesis and transport of materials.

Rough ER: Has ribosomes attached to it and is involved in protein synthesis.

Smooth ER: Lacks ribosomes and is involved in lipid synthesis and detoxification.

B. Ribosomes

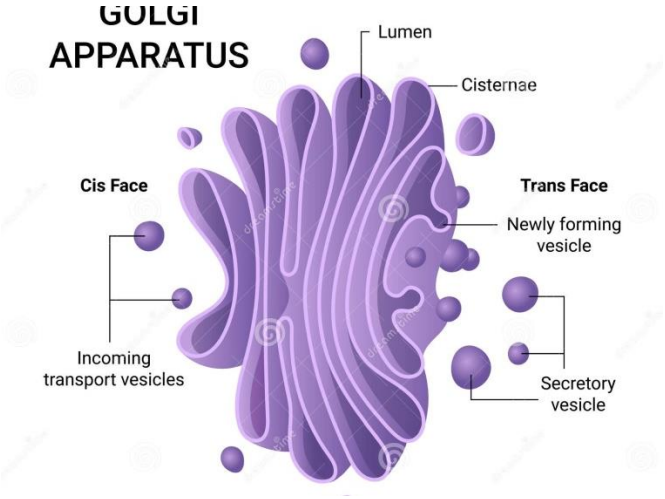
Small structures found in the cytoplasm or attached to the rough ER.

Involved in protein synthesis.

C. Golgi Apparatus

Involved in the packaging and transport of proteins and lipids.

It modifies proteins and packages them into vesicles for transport to other parts of the cell or outside the cell.



D. Lysosomes

Contain digestive enzymes that break down waste materials and cellular debris.

Referred to as the "suicide bags" of the cell, as they can break down the cell itself if damaged.

<u>Special Features of Plant Cells</u>

Cell Wall: Provides structure and support to the plant cell. Made of cellulose.

Chloroplasts: Contain the green pigment chlorophyll, which is essential for photosynthesis. This process converts sunlight into chemical energy, producing food for the plant.

Vacuole: A large, central vacuole stores water, nutrients, and waste products. It helps maintain cell shape and internal pressure.

Cell Division

Mitosis: A type of cell division that results in two identical daughter cells. It is involved in growth, repair, and asexual reproduction.

Meiosis: A type of cell division that reduces the chromosome number by half, producing reproductive cells (sperm and eggs).

Conclusion

Cells are the basic building blocks of life. Understanding cell structure and function is fundamental to understanding biology. While all cells share common features like the cell membrane and cytoplasm, they also have specialized structures to perform specific functions.