Hour: 3 I-3

Structure of Prokaryotic & Eukaryotic Cell

Cells can be classified into two main categories based on their structure & complexity

(1) Prokaryotic Cells :-

Characteristics :-

(i) Lack a true nucleus - instead, they have a nucleoid region where the DNA is located.

(ii) Do not have membrane-bound organelles.

(iii) Generally smaller & simpler

(iv) eg. Bacteria & Archaea.

Components.

Cell membrane - A lipid bilayer that encloses the cell.

Cell Wall - provides structure and protection

Cytoplasm - Gel like substance where cellular process occur.

Ribosomes - Structures responsible for protein synthesis.

Nucleoid - Region where the cell's DNA is located.

(2) Eukaryotic Cell :-

Characteristics :-

(i) Have a true nucleus enclosed by a nuclear membrane.

(ii) Contain membrane-bound organelles, each with specific function.

(iii) Generally larger and more complex than prokaryotic cells.

(iv) eg. Cells of animals, plants, fungi & protists.

Components:-

Cell Membrane - A lipid bilayer that encloses the cell

Nucleus - Contains the cell's DNA and controls its activities.

Mitochondria:- Power houses of the cell, responsible for energy production.

Endoplasmic Reticulum(ER) - Network of membranes involved in protein & lipid synthesis - Can be rough (with ribosomes) or Smooth (without ribosomes)

Golgi Apparatus:- Modifies, sorts, and packages proteins and lipids for transport.

Lysosomes:- Contain enzymes for digestion of cellular waste.

Cytoskeleton:- Provides structural support and aids in Cell Movement.

Chloroplasts - Sites of photosynthesis, Converting solar energy into chemical energy.

Prokaryotic Vs Eukaryotic Cells

Feature	Prokaryotic Cells	Eukaryotic Cells
Nucleus	No true Nucleus	True Nucleus present
Size	Smaller (1-10 μm)	Larger (10-100 μm)
Organelles	No membrane-bound organelles	Membrane-bound organelles
DNA structure	Circular DNA	Linear DNA
Examples	Bacteria, Archaea	Animals, Plants, Fungi, Protists