
Cell

The basic unit of life

Cell theory

- ❑ Proposed by Matthias Schleiden and Theodore Schwann.
- ❑ All living organisms are composed of cells and products of cells.
- ❑ All cells arise from pre-existing cells.

Types of cells:

Prokaryotic cell

Eukaryotic cell

Prokaryotic cells

- ❑ Include bacteria, blue green algae and mycoplasma.
- ❑ Presence of plasmid in bacteria
- ❑ Lack of nuclear membrane, cell organelles
- ❑ Presence of ribosomes, mesosome.

Cell envelope

- ❑ Outermost glycocalyx
- ❑ Middle cell wall
- ❑ Innermost plasma membrane

Animal Cell Structure

- ❑ Animal cells are enclosed by a plasma membrane and containing a membrane-bound nucleus and organelles.
- ❑ Unlike the eukaryotic cells of plants and fungi, animal cells do not have a cell wall.

Transport across the cell membrane

- ❑ Passive transport
- ❑ Osmosis
- ❑ Active transport

Centrioles

- ❑ Self-replicating organelles made up of nine bundles of microtubules and are found only in animal cells.
- ❑ They appear to help in cell division.
- ❑ Centrioles form the basal bodies of cilia or flagella and spindle fibres.

Cilia and Flagella

- ❑ Essential for the locomotion of individual organisms.
- ❑ Function to move fluid or materials.

Endoplasmic Reticulum

- A network of sacs that manufactures, processes, and transports chemical compounds for use inside and outside of the cell.

Golgi Apparatus

- ❑ The distribution and shipping department for the cell's chemical products.
- ❑ Modifies proteins and fats built in the endoplasmic reticulum and prepares them for export to the outside of the cell.

Lysosomes

- Main function is digestion.

Microfilaments

- Microfilaments are solid rods made of globular proteins called actin. These filaments are primarily structural in function and are an important component of the cytoskeleton.

Microtubules

These straight, hollow cylinders are found throughout the cytoplasm of all eukaryotic cells (prokaryotes don't have them) and carry out a variety of functions, ranging from transport to structural support. Microtubules are made of tubulin protein.

Mitochondria

In the animal cell, they are the main power generators, converting oxygen and nutrients into energy.

Nucleus

- 1) Serves as the information processing and administrative center of the cell.
- 2) It stores the cell's hereditary material, or DNA.
- 3) It coordinates the cell's activities, which include growth, intermediary metabolism, protein synthesis, and reproduction (cell division).

Peroxisomes

These are single membrane bound bodies containing catalase enzyme .

Ribosomes

Tiny organelles composed of approximately 60 percent RNA and 40 percent protein. In eukaryotes, ribosomes are made of four strands of RNA. In prokaryotes, they consist of three strands of RNA.

Nucleosomes

- ▣ Bead like structures formed by association of histones and DNA

Chromatin

- Euchromatin
- Heterochromatin

Plastids

- ❑ Chloroplast
- ❑ Leucoplast
- ❑ Chromoplast