

Topic 8.1: Introduction to the Cell (8.1.1-8.1.4)

Cellular Structure



Cellular Structure

The cell is the basic unit of structure and function in all organisms. It is the smallest unit of an organism that can live on its own and reproduce. Cells are made of various organelles that perform different functions. The cell membrane is a barrier that separates the cell from its environment. The nucleus is the control center of the cell, containing the genetic material (DNA). The cytoplasm is the fluid-filled space inside the cell where organelles are located. The cell wall is a rigid structure that provides support and protection for the cell.

Organelle	Function
Nucleus	Stores genetic information and controls cell activities.
Mitochondrion	Produces energy for the cell through cellular respiration.
Chloroplast	Converts light energy into chemical energy through photosynthesis.
Rough Endoplasmic Reticulum	Synthesizes and transports proteins.
Smooth Endoplasmic Reticulum	Synthesizes lipids and detoxifies drugs.
Golgi Apparatus	Modifies, sorts, and packages proteins for transport.
Lysosome	Digests and recycles cellular waste.
Vacuole	Stores water, nutrients, and waste products.
Centrioles	Organize microtubules and are involved in cell division.

Cellular Processes

Cells perform various processes to maintain their structure and function. These processes include:

- Cellular Respiration:** The process by which cells convert glucose and oxygen into energy (ATP).
- Photosynthesis:** The process by which plants and other photosynthetic organisms convert light energy into chemical energy.
- Cellular Division:** The process by which a cell divides into two daughter cells.
- Osmosis:** The movement of water across a semi-permeable membrane.
- Diffusion:** The movement of molecules from an area of high concentration to an area of low concentration.