

# 9<sup>th</sup> Class

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## ➤ Cell Organelles

- ❖ **Introduction:** Cells are the basic structural and functional units of living organisms. They contain various specialized structures called organelles, each with specific functions essential for the cell's survival and proper functioning.
- ❖ **Cell Membrane:** The cell membrane, also known as the plasma membrane, is a selectively permeable membrane that surrounds the cell. It regulates the movement of substances in and out of the cell, providing protection and support.
- ❖ **Nucleus:** The nucleus is often referred to as the control center of the cell. It contains the cell's genetic material, DNA, which carries instructions for the cell's activities. The nucleus regulates gene expression and controls cell growth and reproduction.
- ❖ **Cytoplasm:** The cytoplasm is a jelly-like substance that fills the cell and surrounds organelles. It provides a medium for metabolic reactions to occur and helps in the movement of organelles within the cell.
- ❖ **Endoplasmic Reticulum (ER):** The endoplasmic reticulum is a network of membranes that extends throughout the cytoplasm. It is involved in the synthesis, folding, and transport of proteins and lipids within the cell.
- ❖ **Ribosomes:** Ribosomes are small, spherical organelles found either floating freely in the cytoplasm or attached to the endoplasmic reticulum. They are the sites of protein synthesis, where amino acids are assembled into proteins according to the instructions provided by mRNA.
- ❖ **Golgi Apparatus:** The Golgi apparatus is a stack of membrane-bound sacs responsible for modifying, sorting, and packaging proteins and lipids for secretion or delivery to other cellular locations.
- ❖ **Mitochondria:** Mitochondria are often called the powerhouse of the cell because they generate energy in the form of ATP through cellular respiration. They contain their own DNA and ribosomes, suggesting that they were once independent prokaryotic organisms that were engulfed by ancestral eukaryotic cells.

- ❖ **Lysosomes:** Lysosomes are membrane-bound vesicles containing digestive enzymes. They break down waste materials, foreign particles, and worn-out organelles, playing a crucial role in cellular recycling and waste disposal.
- ❖ **Conclusion:** Understanding the structure and function of cell organelles is essential for comprehending the complex processes that occur within cells. Each organelle contributes to the overall functioning and survival of the cell, highlighting the remarkable complexity and organization of living organisms at the cellular level.