



# **SNS COLLEGE OF ENGINEERING**

Kurumbapalayam (Po), Coimbatore – 641 107

**AN AUTONOMOUS INSTITUTION**

Accredited by NAAC – UGC with 'A' Grade

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

**Department of Mechanical Engineering**

**19BY701 - BIOLOGY FOR ENGINEERS**

**UNIT -1 | INTRODUCTION TO LIFE**

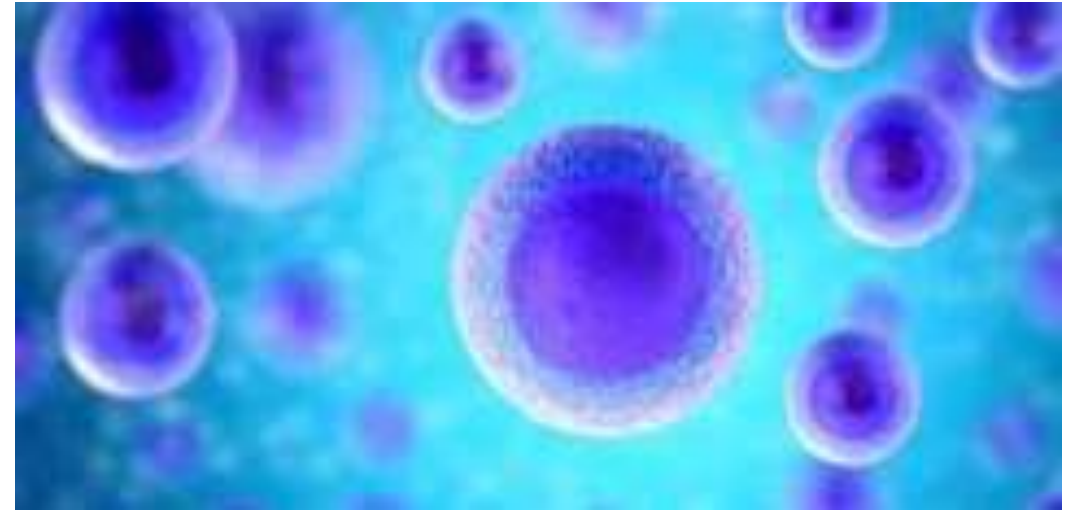
**Prepared by**

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**Ap/Mech**

# CELL THEORY

- Cell theory states that living organisms are made up of cells, that they are the basic structural/organizational unit of all organisms, and that all cells come from pre-existing cells.
- Cell theory is a fundamental concept in biology that provides a framework for understanding the structure and function of living organisms. It is based on three main principles:
  1. **All Living Organisms Are Composed of Cells.**
  2. **The Cell is the Basic Unit of Structure and Function in Organisms**
  3. **All Cells Arise from Pre-existing Cells**

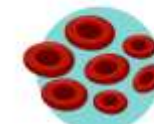


# CELL THEORY

## 1. All Living Organisms Are Composed of Cells

- **Definition:** This principle states that cells are the basic structural and functional units of all living organisms. Whether an organism is unicellular (like bacteria and protists) or multicellular (like plants, animals, and fungi), it is made up of cells.
- **Implication:** Every aspect of an organism's life, from growth and development to metabolism and reproduction, occurs at the cellular level.

### Types Of Human Body Cells



Red Blood Cells



White Blood Cells



Nerve Cells



Stem Cells



Intestinal Cells



Bone Cells



Sperm Cells

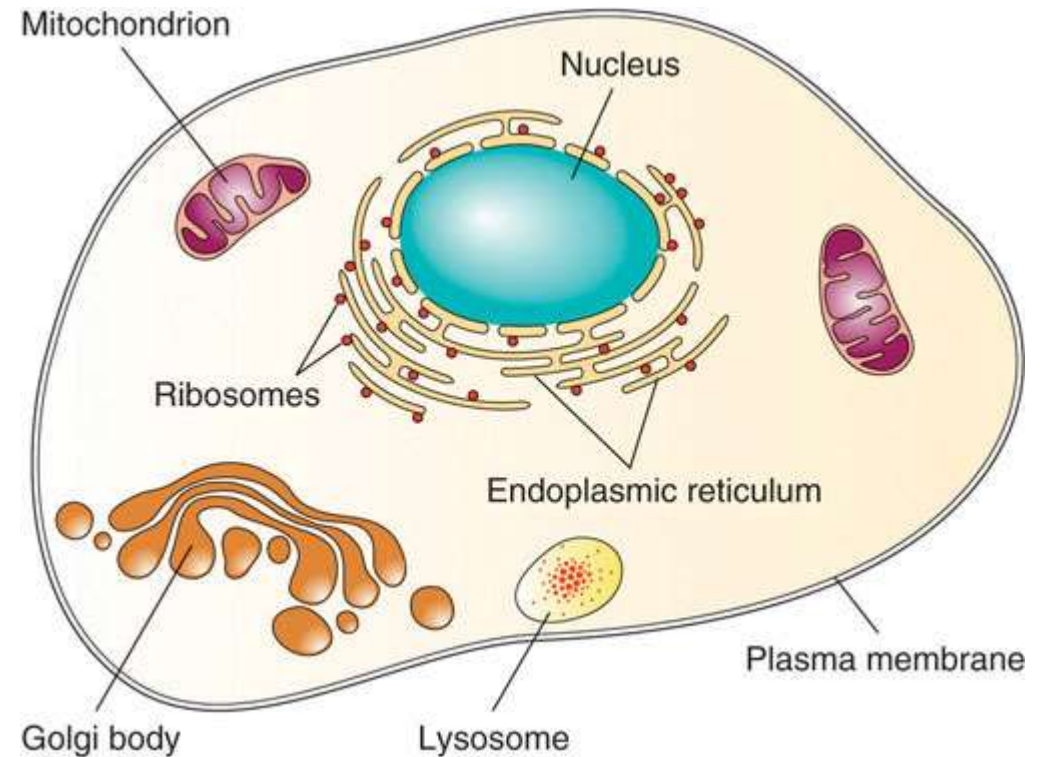


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# CELL THEORY

## 2. The Cell is the Basic Unit of Structure and Function in Organisms

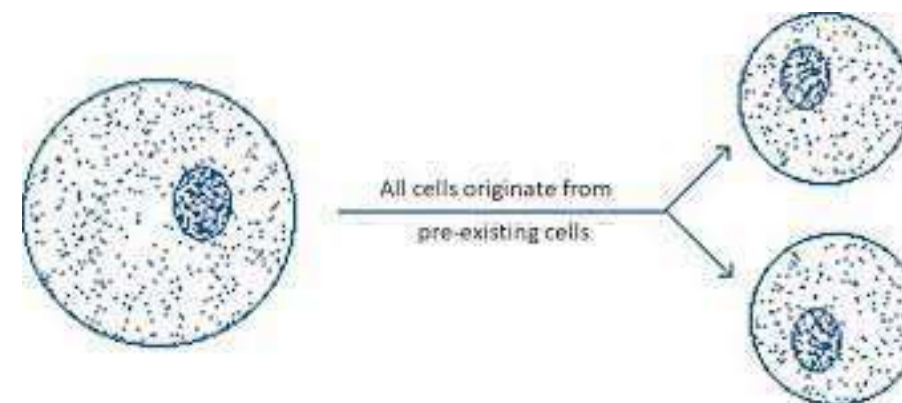
- **Definition:** Cells are the smallest units capable of performing all life processes. They provide structural support and perform essential functions such as metabolism, energy production, and waste elimination.
- **Implication:** Understanding how cells work is crucial for understanding how entire organisms function. Cells operate as functional units, performing all necessary processes to maintain life.



# CELL THEORY

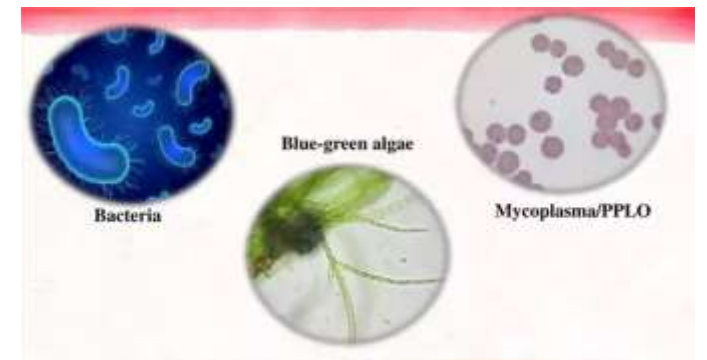
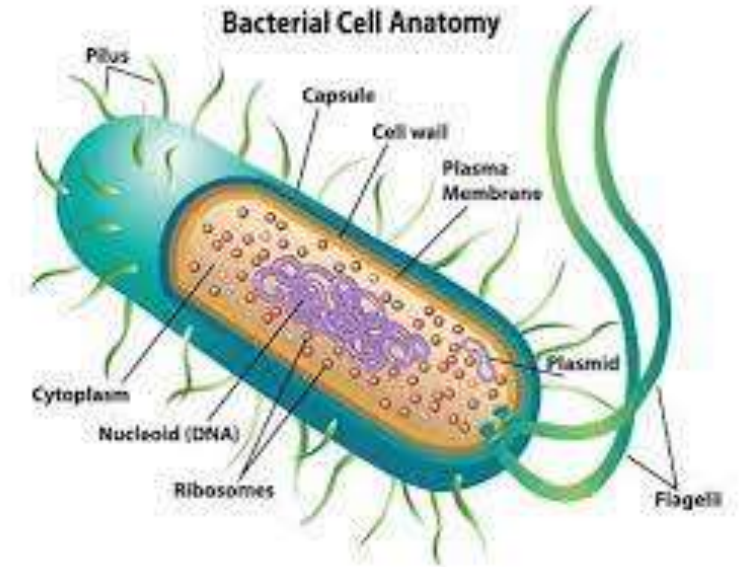
## 3. All Cells Arise from Pre-existing Cells

- **Definition:** This principle asserts that new cells are produced only through the division of existing cells. This concept was established by Rudolf Virchow, who extended earlier observations to include the idea that all cells come from other cells.
- **Implication:** This principle highlights the continuity of life and the process of cell division (mitosis and meiosis) as fundamental to growth, repair, and reproduction in living organisms.



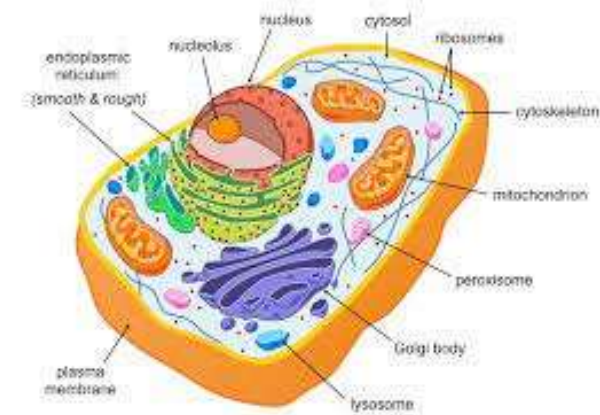
# PROKARYOTIC CELL

- Prokaryotic cells are **single-celled microorganisms known to be the earliest on earth**. Prokaryotes include Bacteria and Archaea.
- The photosynthetic prokaryotes include cyanobacteria that perform photosynthesis.
- A prokaryotic cell consists of a single membrane and therefore, all the reactions occur within the cytoplasm



# EUKARYOTIC CELL

- A eukaryotic cell has a **nuclear membrane**. It has **mitochondria, Golgi bodies, cell wall**.
- It also contains **locomotory organs** such as **cilia and flagella**.
- The nucleus has a DNA that carries all the genetic information





# ASSESSMENT

## Fill Ups

- Cell theory states that living organisms are made up of cells, that they are the basic structural/organizational unit of all organisms, and that all cells come from \_\_\_\_\_.
- Cell theory is a fundamental concept in biology that provides a framework for understanding the \_\_\_\_\_ and \_\_\_\_\_ of living organisms.