# Cell theory :

The cell theory is a fundamental concept in biology that explains the basic properties of cells. It was first proposed in 1838-39 by two German scientists, Matthias Schleiden, a botanist, and Theodor Schwann, a zoologist. Later, in 1855, Rudolf Virchow expanded the theory by adding the idea that all cells arise from pre-existing cells (Omnis cellula e cellula).

The three main postulates of the cell theory are:

**1.**All living organisms are composed of one or more cells: This means cells are the building blocks of all living beings, from single-celled bacteria to multicellular organisms like humans.

**2.**The cell is the basic unit of structure and function in living organisms: Every cell is a self-contained unit that performs all the essential life processes, such as metabolism, growth, and reproduction.

**2.**All cells arise from pre-existing cells: New cells are formed through the process of cell division, ensuring continuity of life.



This theory forms the basis for understanding complex life processes and diseases at the cellular level.

Also,, the cell theory did not apply to viruses, as they lack a cellular structure and can only reproduce inside a host cell. Additionally, it did not explain the origin of the first cell on Earth.

## 2. Cell wall :

In plant cells ,cell wall is the rigid outer covering , outside the plasma membrane.

- Unlike plasma membrane it is freely permeable.
- Provides shape to the cell.
- Provides mechanical strength and prevent the cell from bursting under high water pressure.
- It is made of cellulose in plants , chitin in fungi .
- *Plasmolysis - when plant cell loses water through osmosis there is contraction of contents of cell away from the cell wall , this is known as plasmolysis*



## 3.Nucleus :

The control center of the cell and controls all activities of cell.

- Contains genetic material (DNA) and directs protein synthesis.
- Stores genetic information.
- Plays a key role in cell division.