

# Fundamental Unit Of Life

Unit - Organization in Living World

Lesson – 1

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Important topic for class 9<sup>th</sup>

# Outline:

- Introduction
- Discovery
- Cell Theory
- Types of organism
  - i. Unicellular
  - ii. Multicellular
- Types of Cells
  - i. Prokaryotic
  - ii. Eukaryotic

# INTRODUCTION

**Fundamental** - forming the  
base, from which everything else  
develops



# Fundamental Unit



Lemonade

-

Lemon

Life

-

Cell

# Cell *(Lt. little room)*

Cell is the structural and functional unit of life.

- ✓ Define Cell ?
- ✓ What is the fundamental Unit of Life ?
- ✓ What is know as the structural and functional unit of life ?

## Structural Unit –

provides structure to body of organism

## Functional Unit –

the functions of the body take place at cellular level.

- ✓ Why is Cell known as the structural and functional unit of life ?

# DISCOVERY

- **Discovered by Robert Hooke in 1665**  
“He observed the cells in a cork slice with the help of a primitive microscope.”
- **Leeuwenhoek (1674)**  
“With the improved microscope, discovered the free-living cells in pond water for the first time.”
- ✓ Who discovered the cell?
- ✓ How was cell discovered by Robert Hooke ?

- **Robert Brown in 1831**

“Discovered the nucleus in the cell.”

- **Purkinje in 1839**

“Coined the term ‘protoplasm’ for the fluid substance of the cell.”

✓ Who discovered the nucleus in the cell ?

✓ Who coined the term ‘protoplasm’?



# CELL THEORY

M. Schleiden (1838) and T. Schwann (1839).

- All living organisms are composed of cells.
- Cell is the fundamental unit of life.

- Viruses are living or non-living?

- ✓ Write the cell theory proposed by Schleiden and Schwann?

# RUDOLF VIRCHOW (1855)

Expanded the cell theory

Gave the phrase

“Omnis cellula-e-cellula”

i.e., all cells arises from pre-existing cells

- ✓ Who gave the phrase “ Omnis cellula-e-cellula “ ? Write its meaning .
- ✓ Who expanded the cell theory?

# MODERN CELL THEORY

- **POSTULATES**

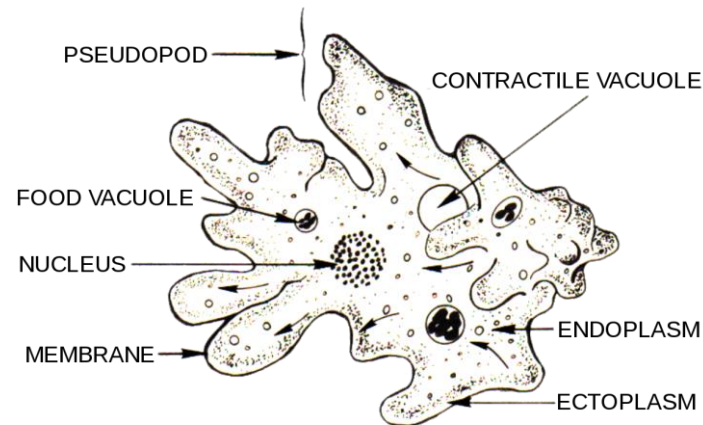
- All living organisms are composed of cells or cell products.
- All living cells arise from pre-existing cells.
- All cells are basically alike in chemical composition and metabolic processes.
- ✓ Write the postulates of modern cell theory ?

# TYPES OF ORGANISM

**Unicellular** - Consists of a single cell.

This means all life processes, such as reproduction, feeding, digestion, and excretion, occur in one cell.

E.g.- Amoeba



**Multicellular** - made of many cells

Different cells are assigned to do different functions  
in a body of multicellular organism

E.g., Plant



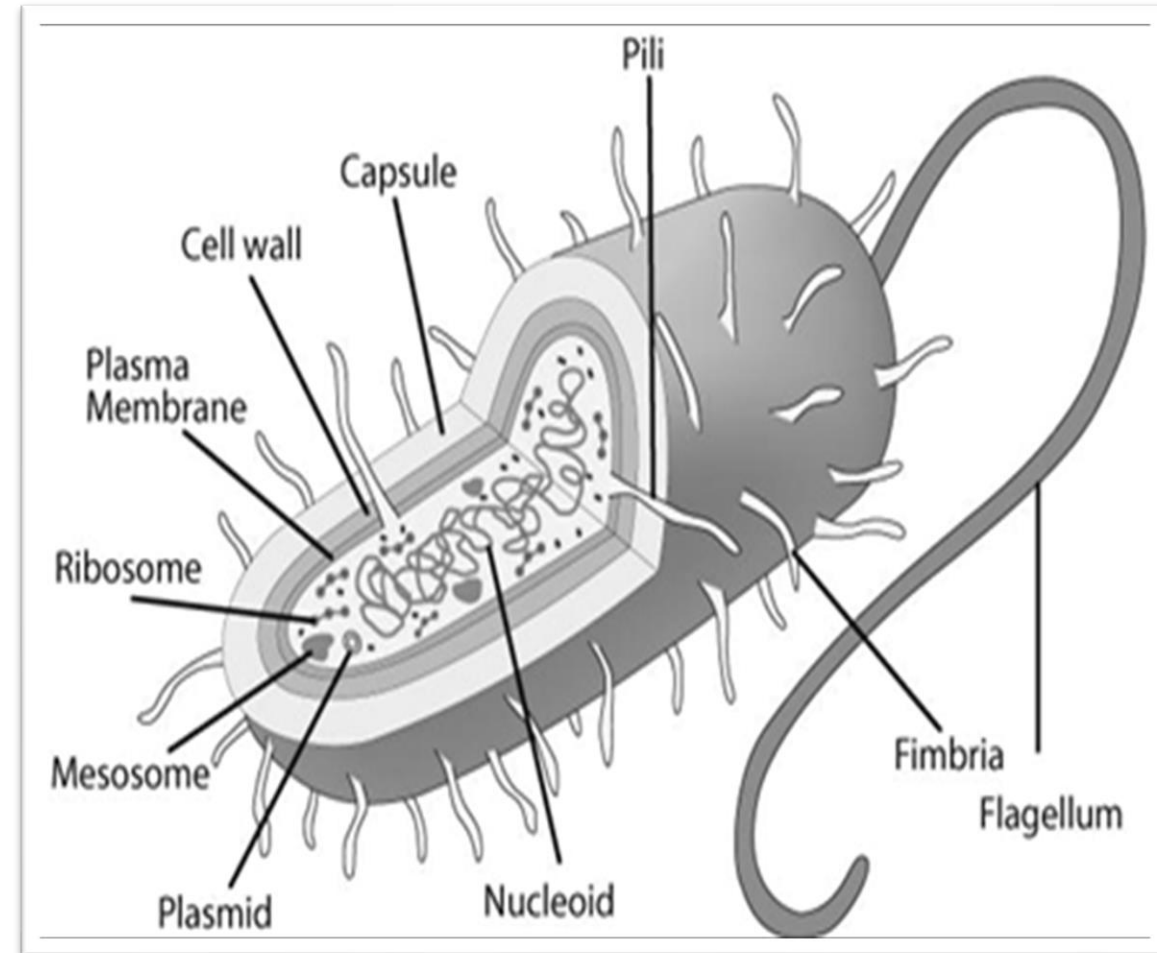
- ✓ Differentiate between unicellular and multicellular organism ?

# TYPES OF CELLS

- Prokaryotic cell

Greek word “*pro*”, (meaning before) and “*karyon*” (meaning kernel)

Prokaryotic cells are cells in which true nucleus is absent



- They are primitive and incomplete cells.
- Prokaryotes are always unicellular organisms.

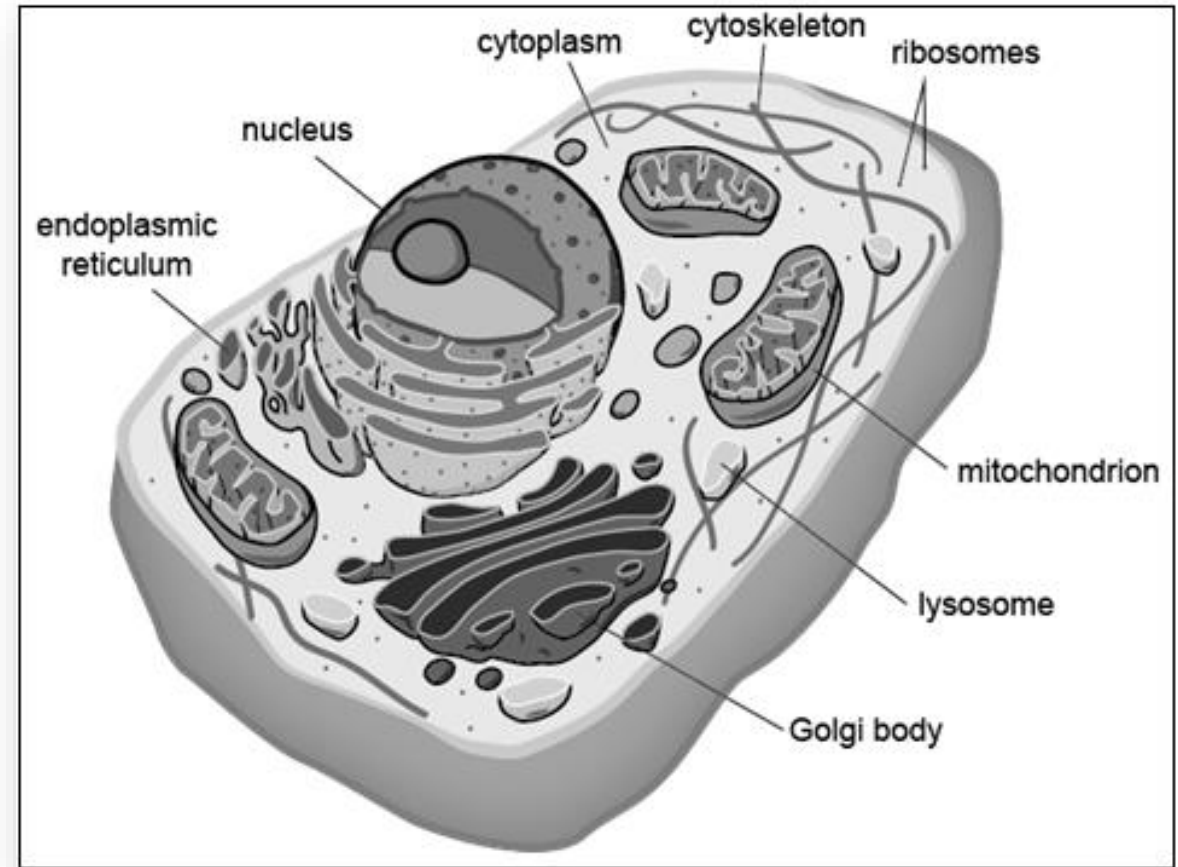
For example, archaebacteria, bacteria, blue green algae are all prokaryotes.

✓ What are Prokaryotic cells ?

# • Eukaryotic Cell

Greek word “*eu*”, (meaning good) and “*karyon*” (meaning kernel)

Eukaryotic cells are the cells in which true nucleus is present.





- They are advanced and complete cells.
- Eukaryotes include all living organisms (both unicellular and multicellular organisms) except bacteria and blue green algae.

✓ What are Eukaryotic Cells ?

DIFFERENCE BETWEEN

PROKARYOTIC CELLS

&

EUKARYOTIC CELLS

# Prokaryotic cell

# Eukaryotic cell

**0.5-3  $\mu\text{m}$  in size**

**2-100  $\mu\text{m}$  in size**

**Nucleus is absent.**

**Nucleus is present.**

**It contains single  
chromosome.**

**It contains more than one  
chromosome.**

**Membrane bound cell organelles are absent.**

**Membrane bound cell organelles such as mitochondria, plastids, endoplasmic reticulum, Golgi apparatus, lysosomes, etc., are present.**

**Cell division takes place by fission or budding.**

**Cell division takes place by mitotic or meiotic cell division.**

✓ **Differentiate between Prokaryotic cells and Eukaryotic Cells?**