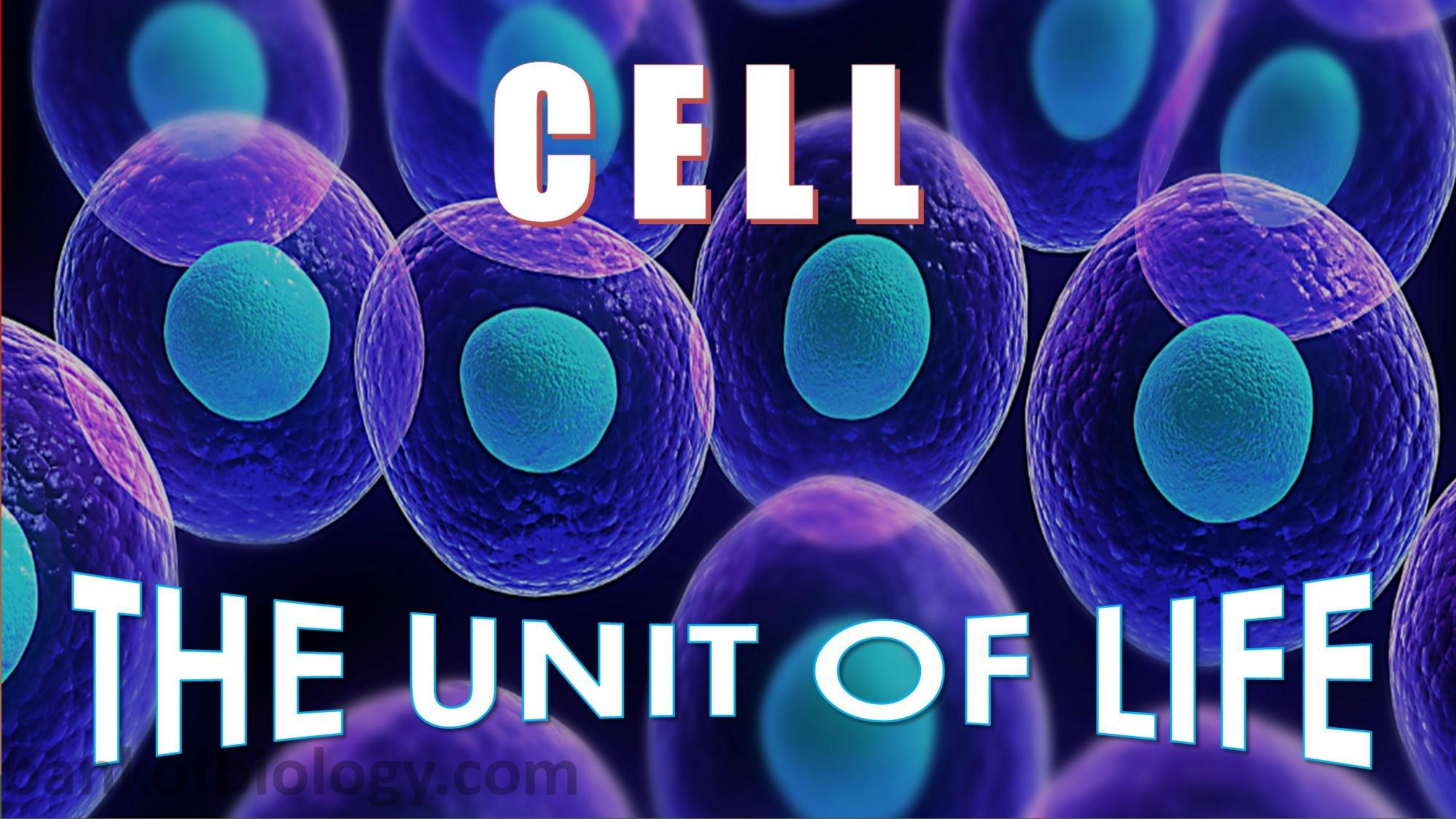
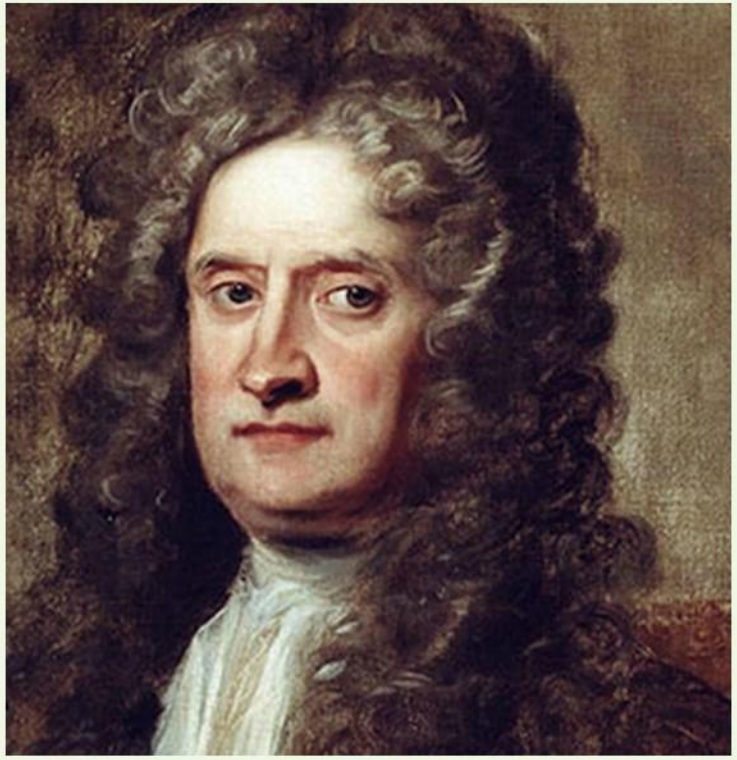

CELL
THE UNIT OF LIFE

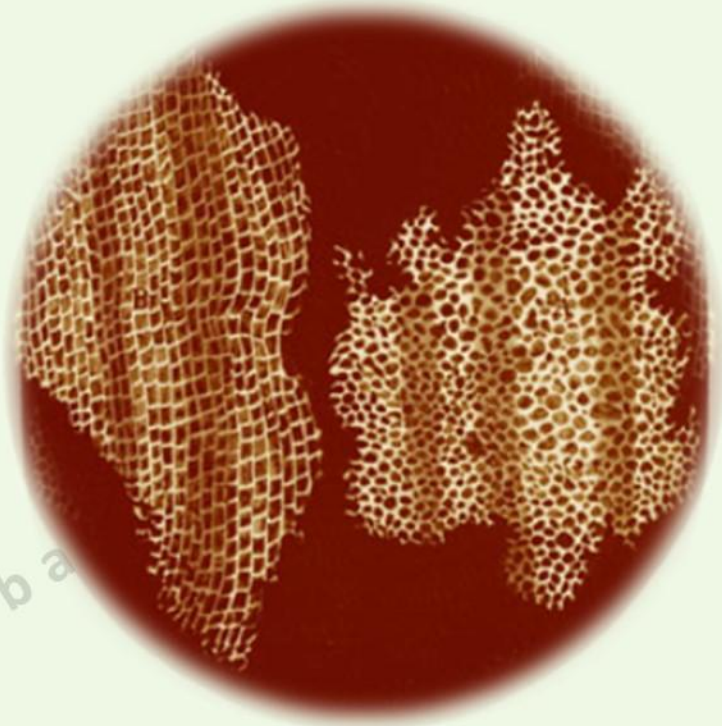
CELL- AN INTRODUCTION

A cell is the fundamental, structural and functional unit of all living organisms.

CELL- AN INTRODUCTION

Robert Hooke:
Discovered cell





Cork cells discovered by Hooke

Anton Von Leeuwenhoek:
First observed and described a live cell.

CELL- AN INTRODUCTION

The invention of **Compound** and **Electron Microscopes** revealed the structural details of the cell.

CELL THEORY

M.J Schleiden

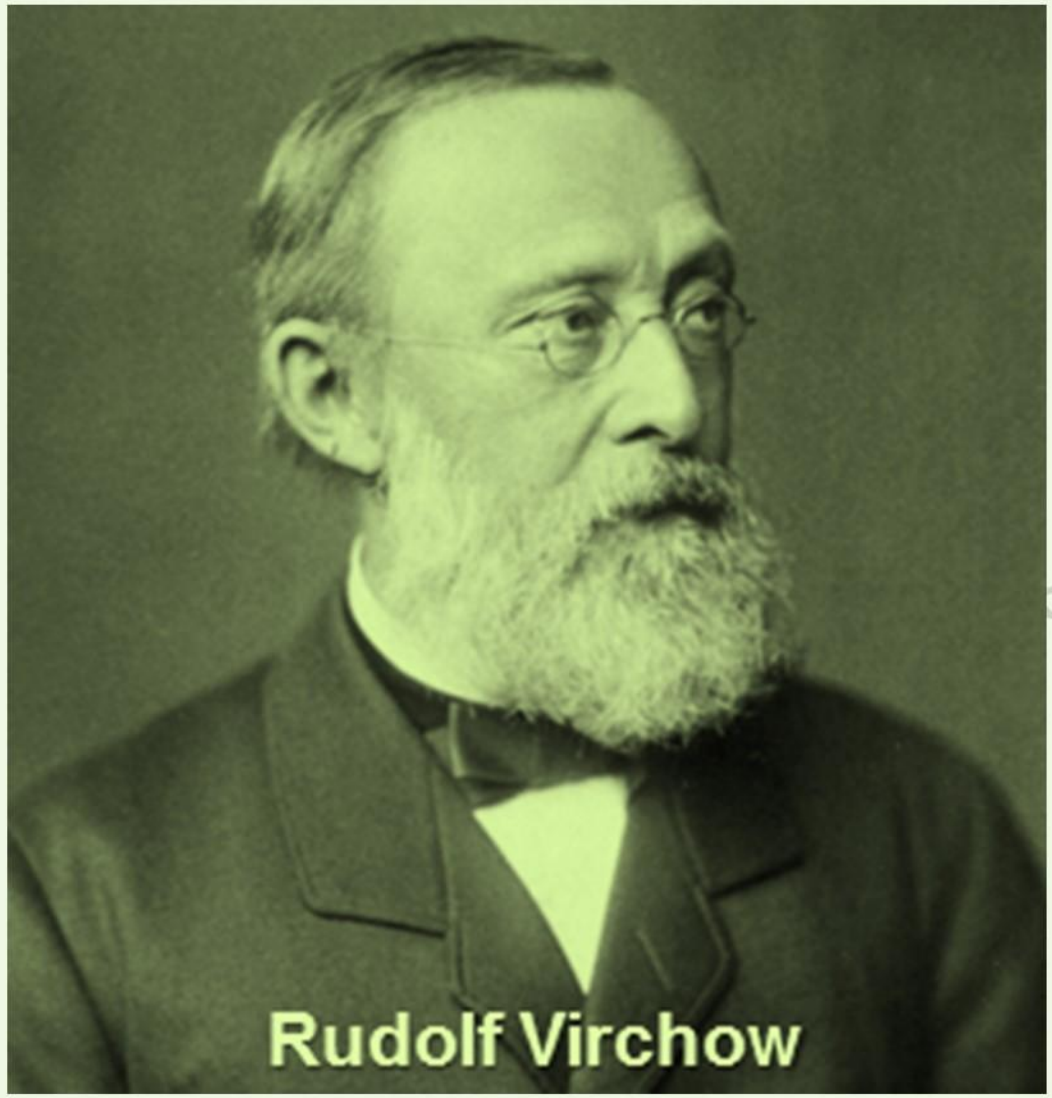
Theodore Schwann

Schleiden & Schwann formulated the Cell Theory.

- Malthias Schleiden (1838) observed that plants are composed of cells.

- Theodore Schwann (1839) reported that cells had a thin outer layer (plasma membrane). He also found that plant cells have cell wall.
- He proposed a hypothesis that animals and plants are composed of cells and products of cells.

CELL THEORY



Rudolf Virchow (1855) explained that cells divided and new cells are formed from pre-existing cells (*Omnis cellula-e cellula*). He modified the cell theory.

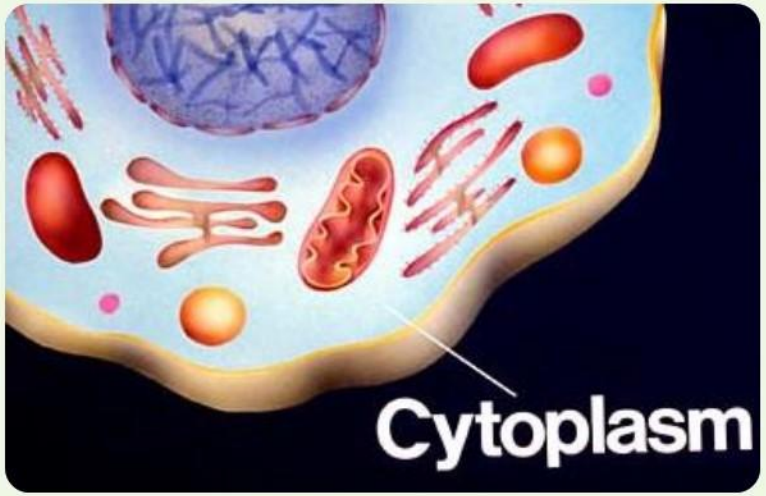
Statements of Cell theory:

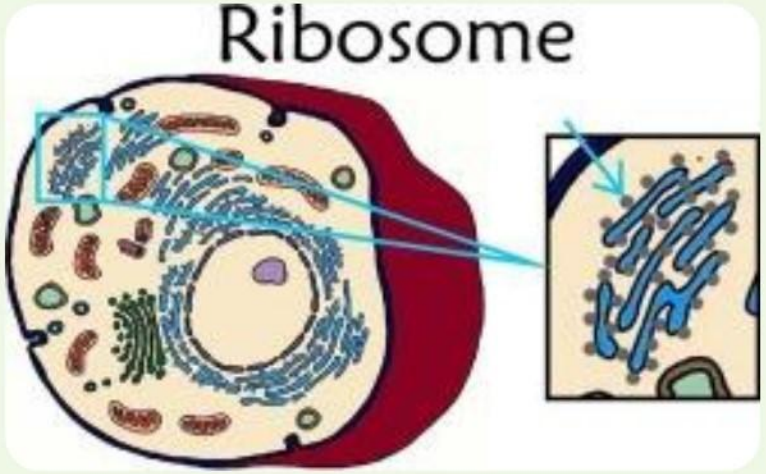
- *All living organisms are composed of cells and products of cells.*
- *All cells arise from pre-existing cells.*

AN OVERVIEW OF CELL

All cells contain

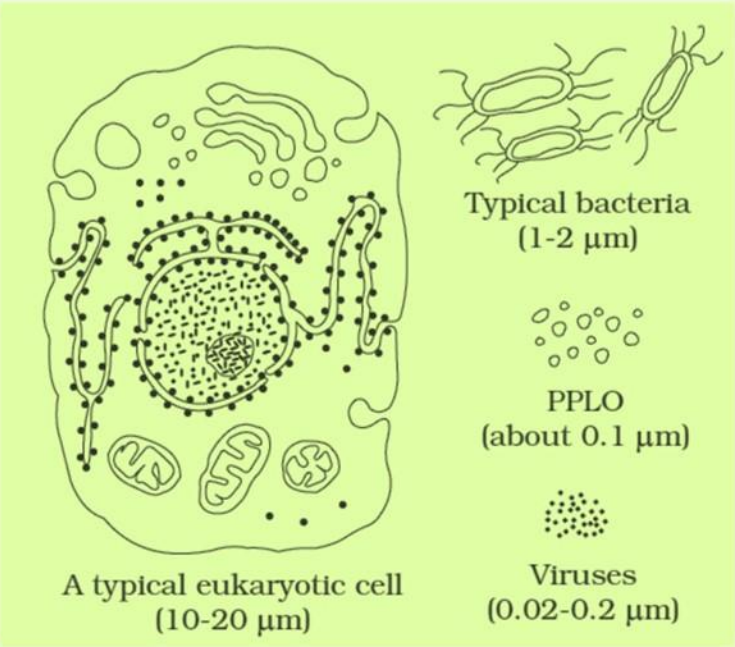
- ✓ **Cytoplasm:** A semi-fluid matrix where cellular activities and chemical reactions occur. This keeps the cell in 'living state'.
- ✓ **Ribosomes:** Non-membrane bound organelles found in cytoplasm, chloroplasts, mitochondria and on rough Endoplasmic Reticulum.

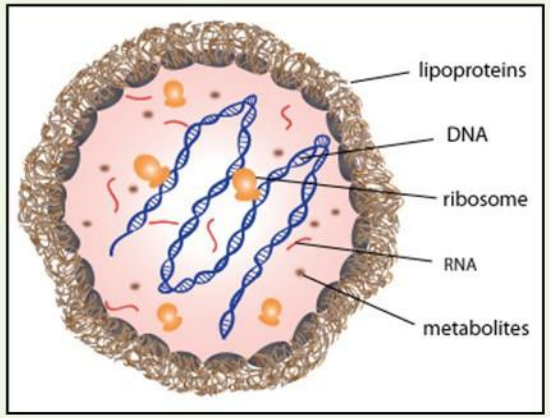


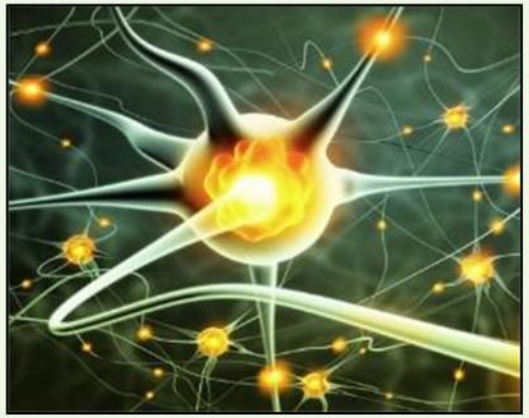


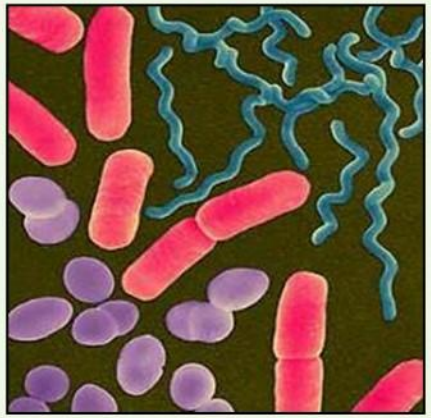
AN OVERVIEW OF CELL

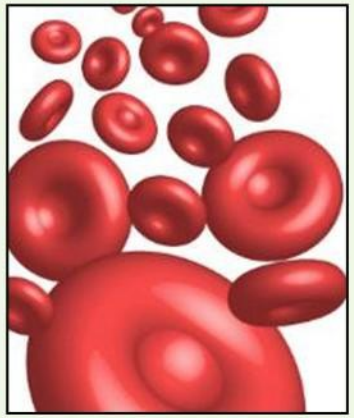
- Smallest cells: **Mycoplasmas (0.3 µm in length)**
- Largest isolated single cell: **Egg of ostrich.**
- Longest cells: E.g. **Nerve cell.**
- Size of bacteria: **3 to 5 µm.**
- Human RBCs: **7.0 µm in diameter.**





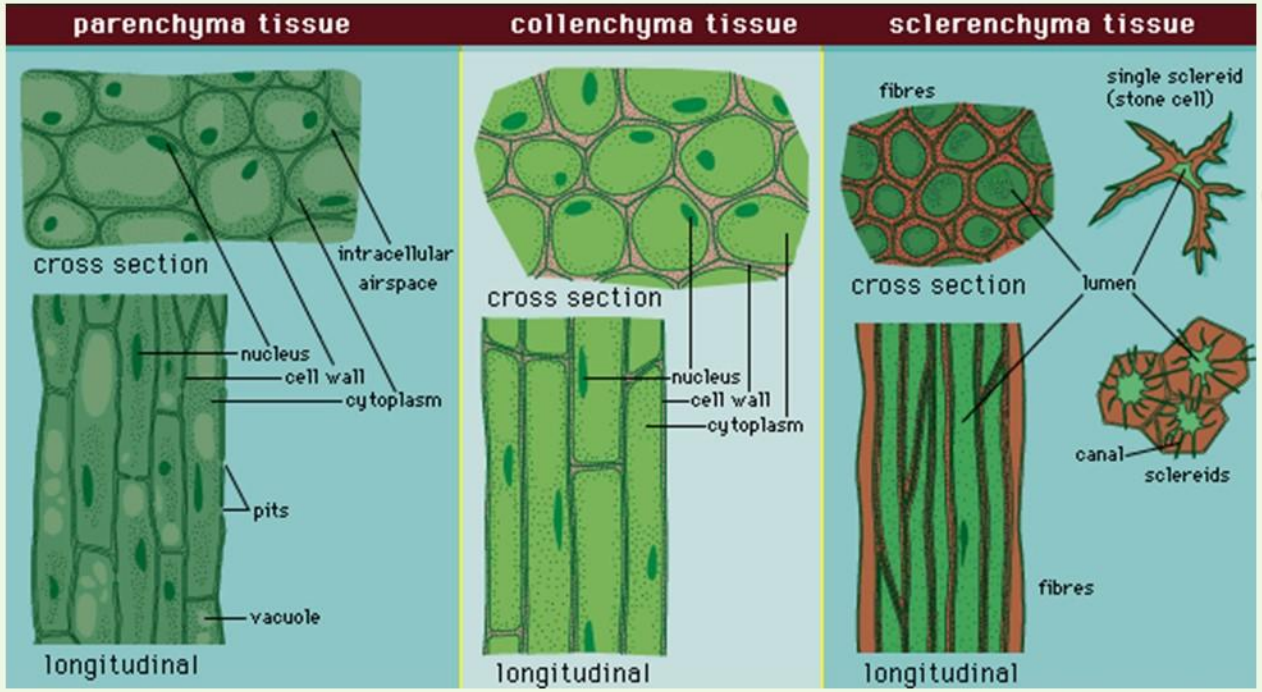


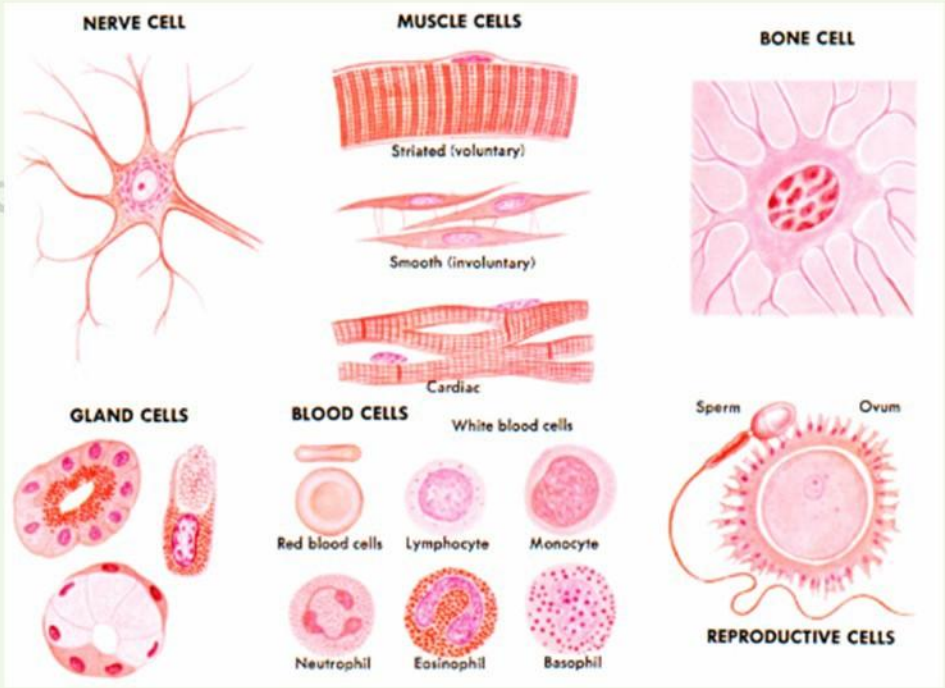




AN OVERVIEW OF CELL

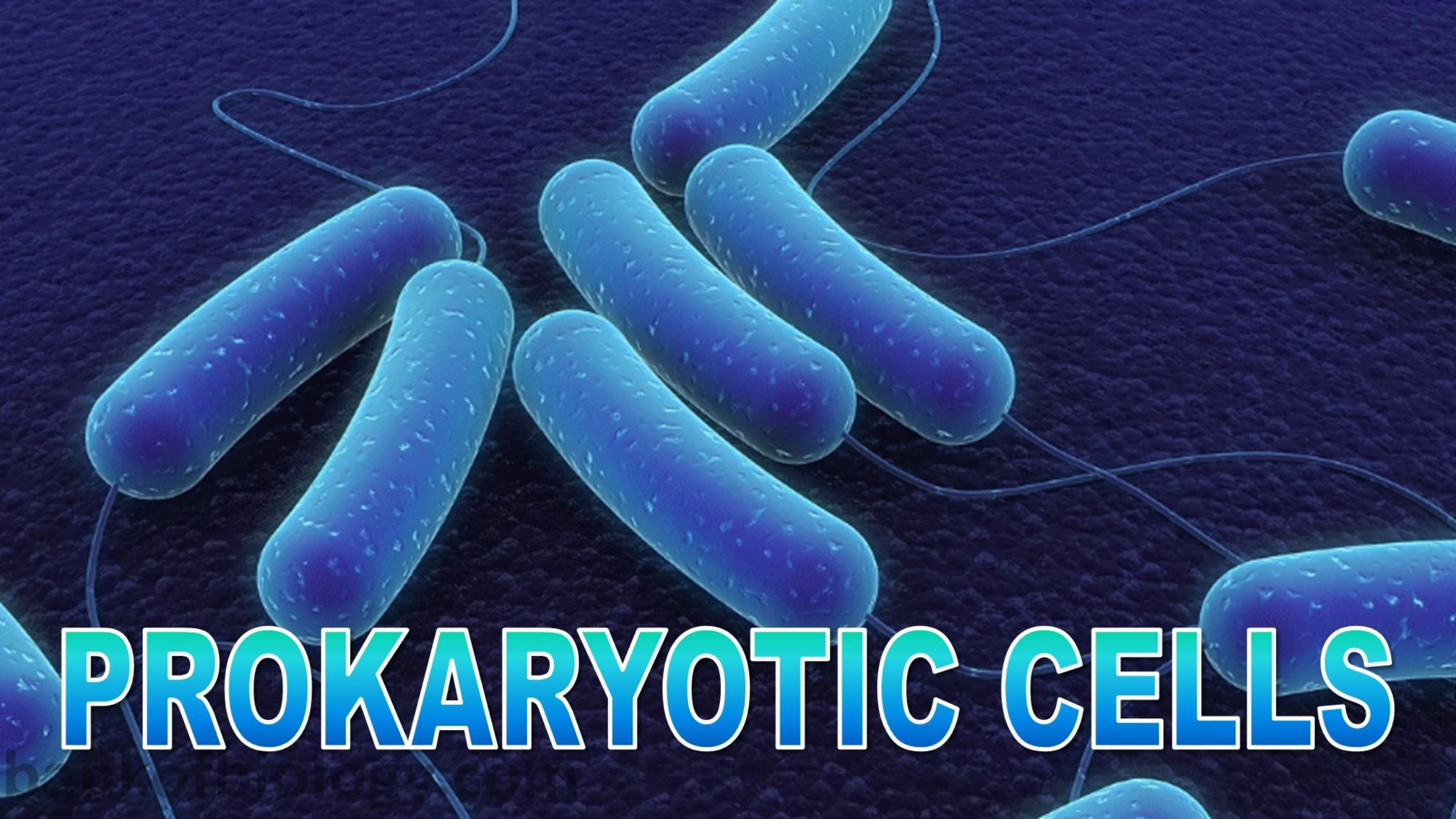
Based on the functions, shape of cells may be disc-like, polygonal, columnar, cuboid, thread like, or irregular.





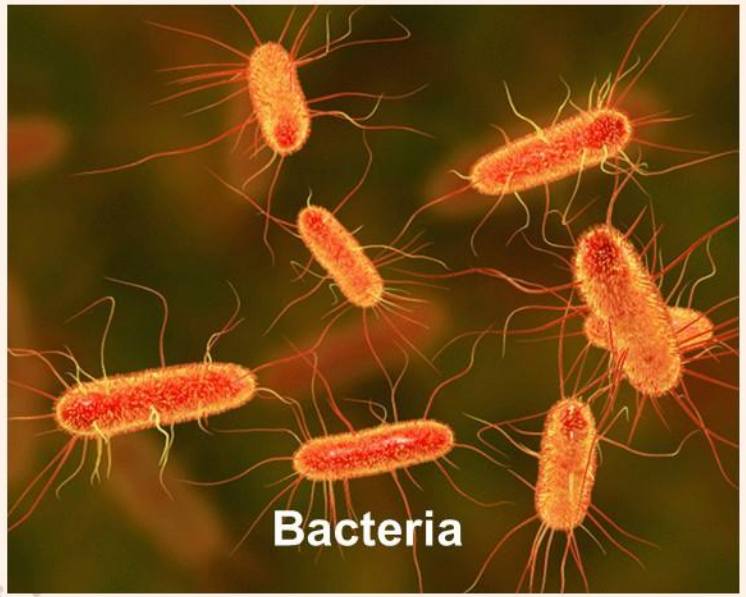
Cells are 2 types:

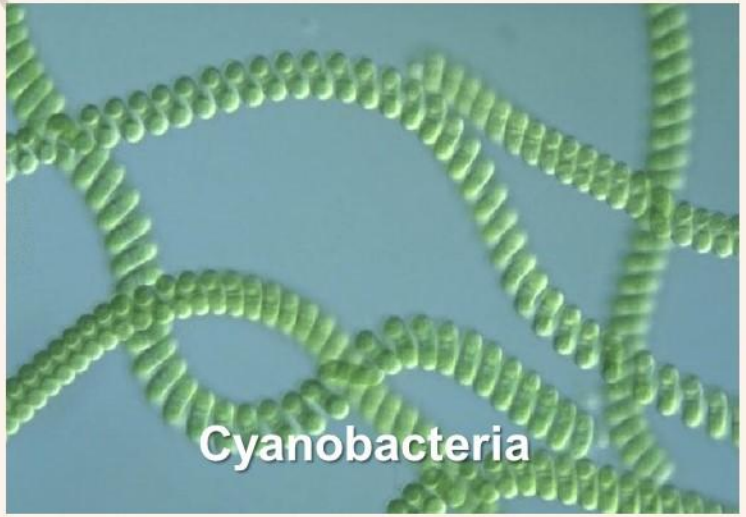
Prokaryotic cells & Eukaryotic cells

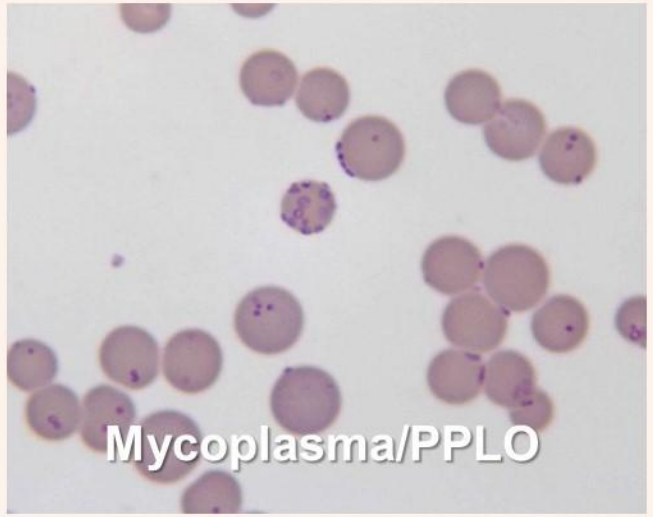

PROKARYOTIC CELLS

PROKARYOTIC CELLS

- They have no membrane bound nucleus and organelles.
- They include **bacteria, blue-green algae, mycoplasma & PPLO (Pleuro Pneumonia-Like Organisms).**
- They are generally smaller and multiply more rapidly than the eukaryotic cells.
- They vary in shape & size.



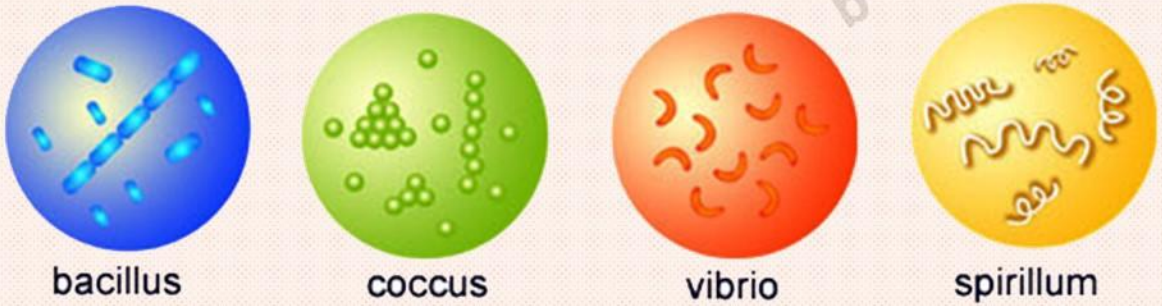


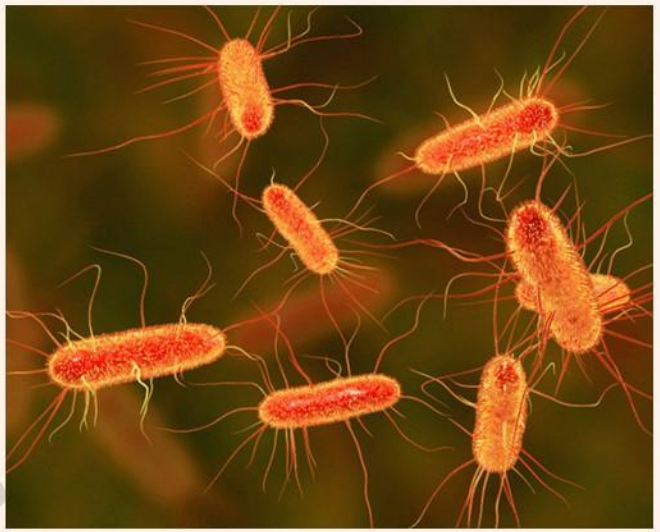


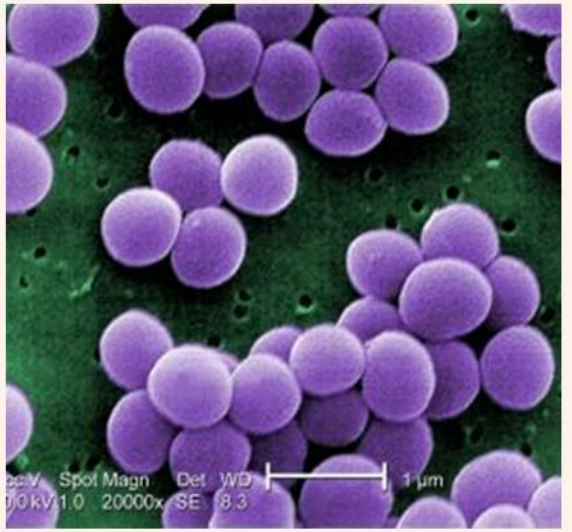
PROKARYOTIC CELLS

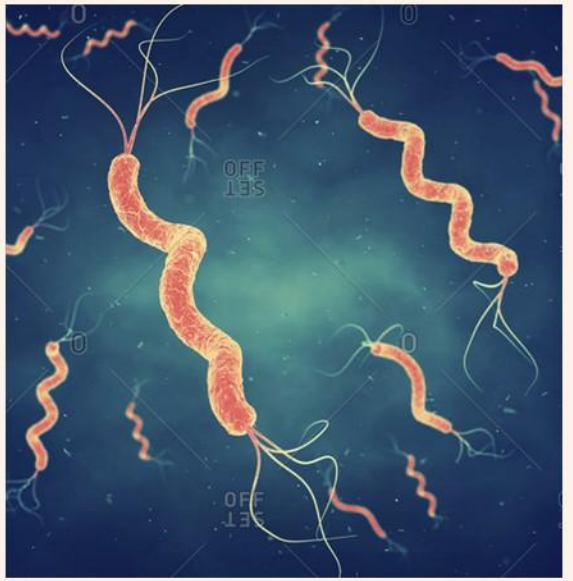
Bacteria have 4 basic shapes:

- **Bacillus** (rod like)
- **Coccus** (spherical)
- **Vibrio** (comma shaped)
- **Spirillum** (spiral)





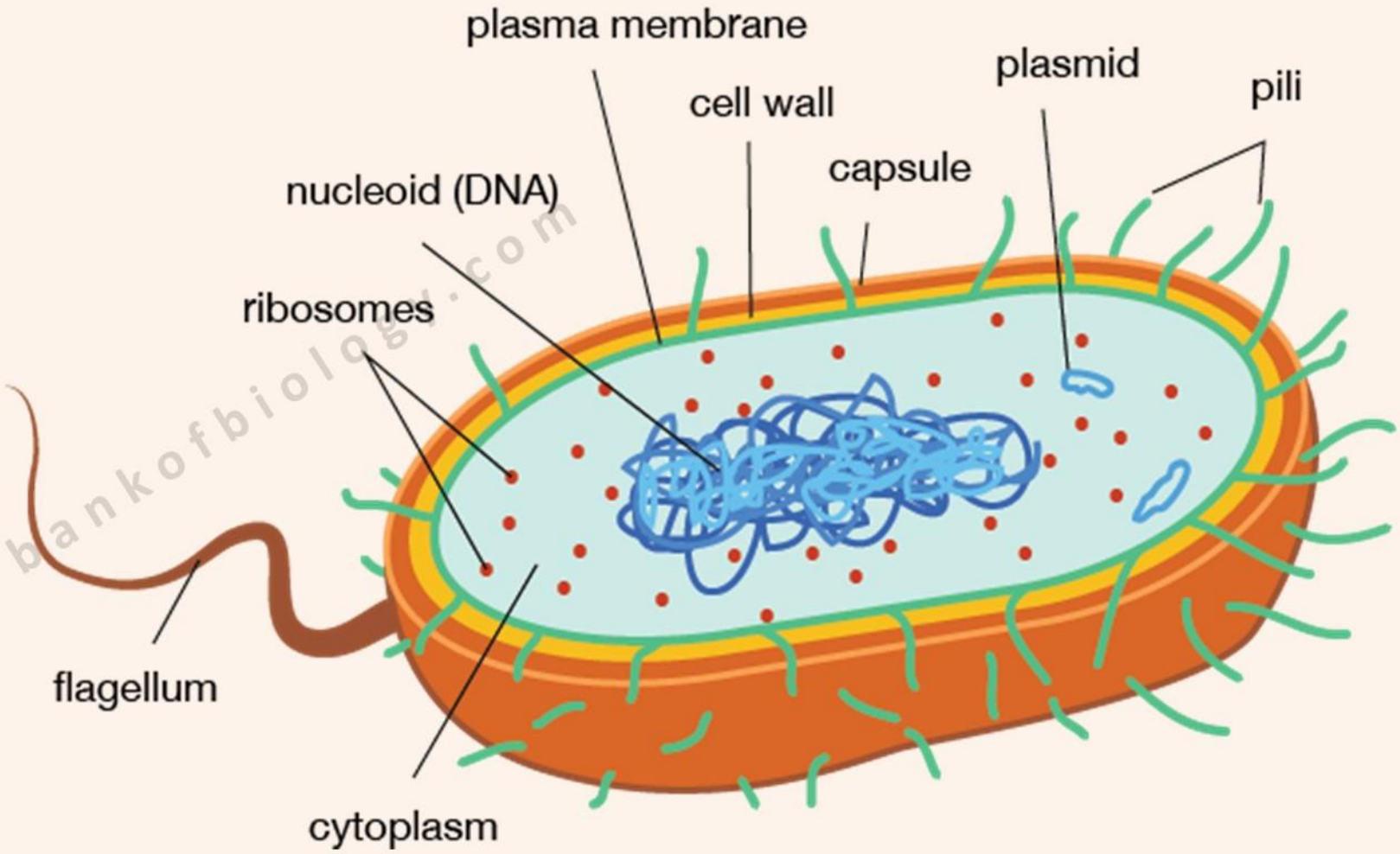




PROKARYOTIC CELLS

CELL ORGANELLES

1. Cell envelope
2. Mesosome & Chromatophores
3. Nucleoid
4. Flagella
5. Pili and Fimbriae
6. Ribosomes
7. Inclusion Bodies



1. Cell Envelope

- It is a chemically complex protective covering.
- It is made of 3 tightly bound layers:
  a. **Glycocalyx**
  b. **Cell wall**
  c. **Plasma membrane**