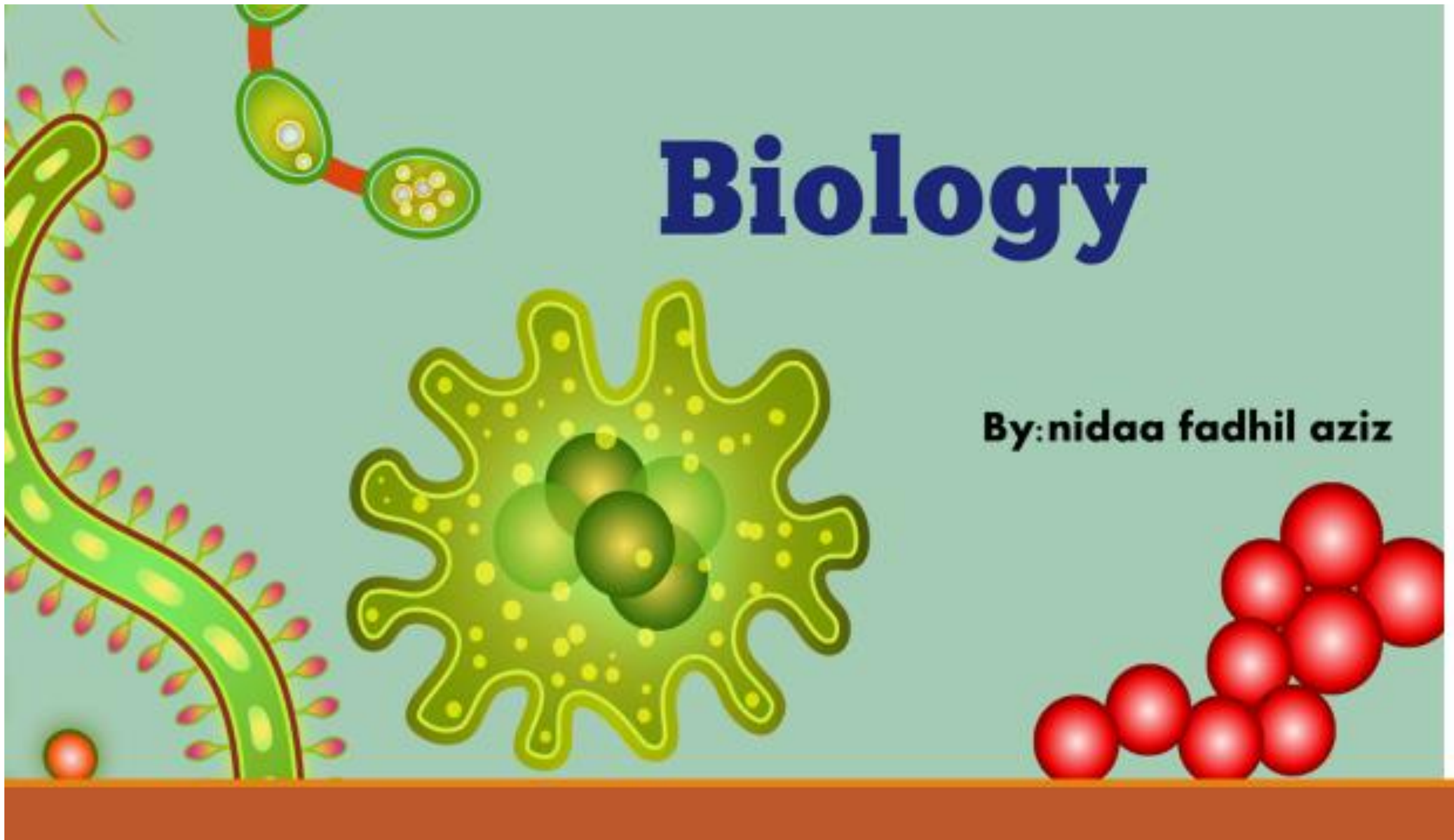


Biology

By: nidaa fadhil aziz





What is Biology?

Biology:

Is the scientific study of life in all its living forms, including **plants**, **animals** and **microorganisms**.

The word Biology means, "The science of life", from the Greek bios, life, and logos, to study or knowledge

- cell is the basic unit of life
- genes (consisting of DNA or RNA) are the basic unit of heredity

Some important terms in biology

- **Cell:** the smallest structure unit of life.
- **Tissue:** Arranged similar kinds of cells have specific properties and functions.

For example

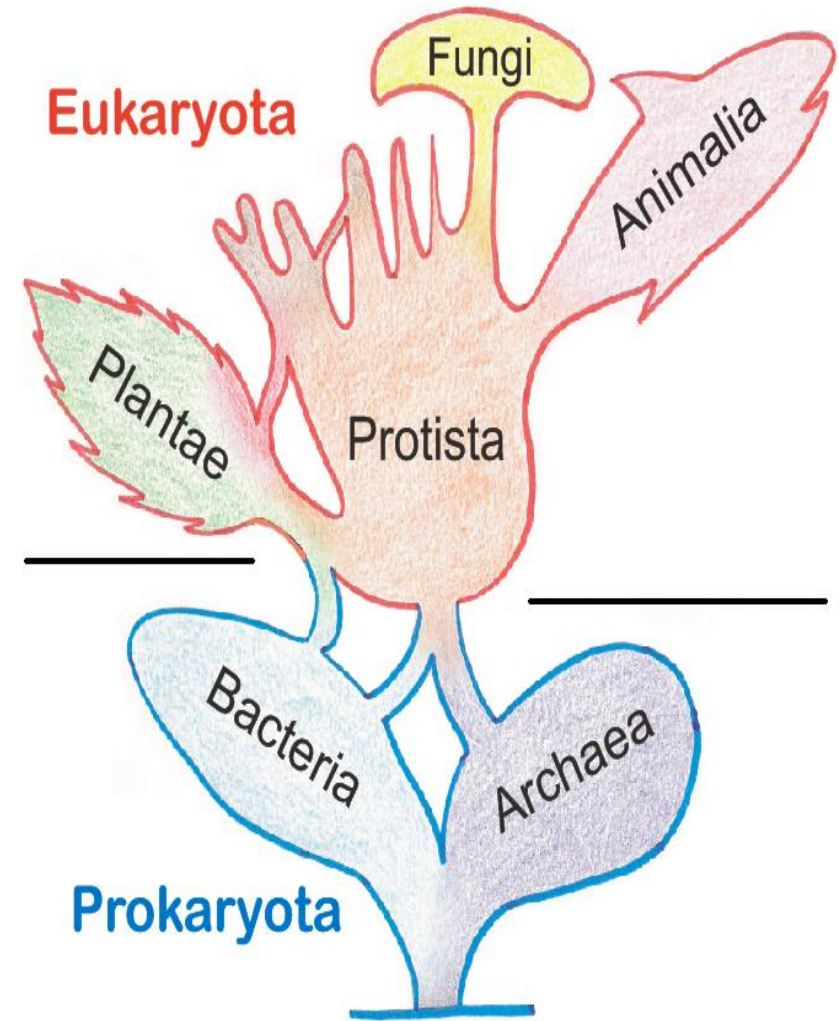
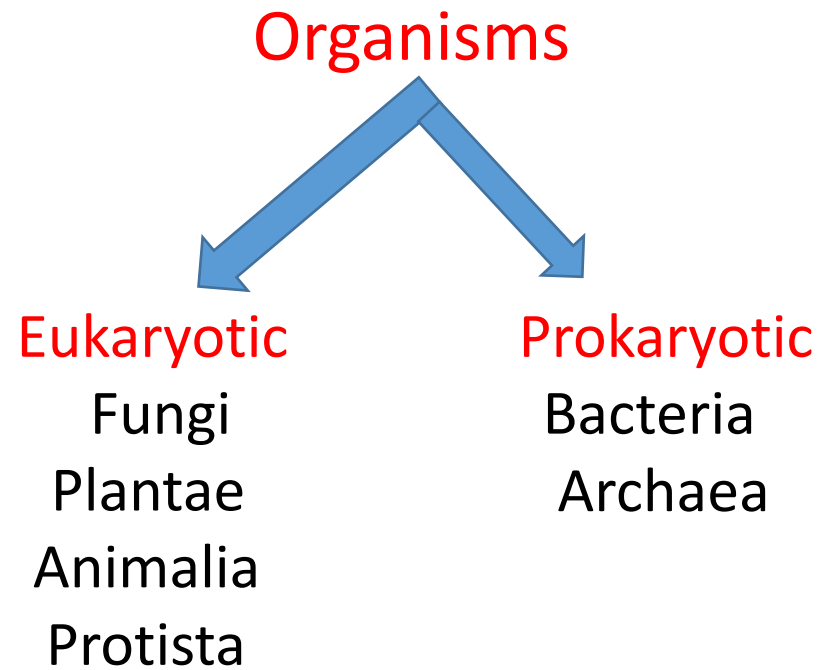
muscle tissue is composed of muscle cells

- **Organ:** Two or more tissues that form a structure with a specific function.
- **System:** consists of two or more organs which perform a specific task.

Some systems are:

nervous, skeletal, muscular, circulatory, digestive system, etc.

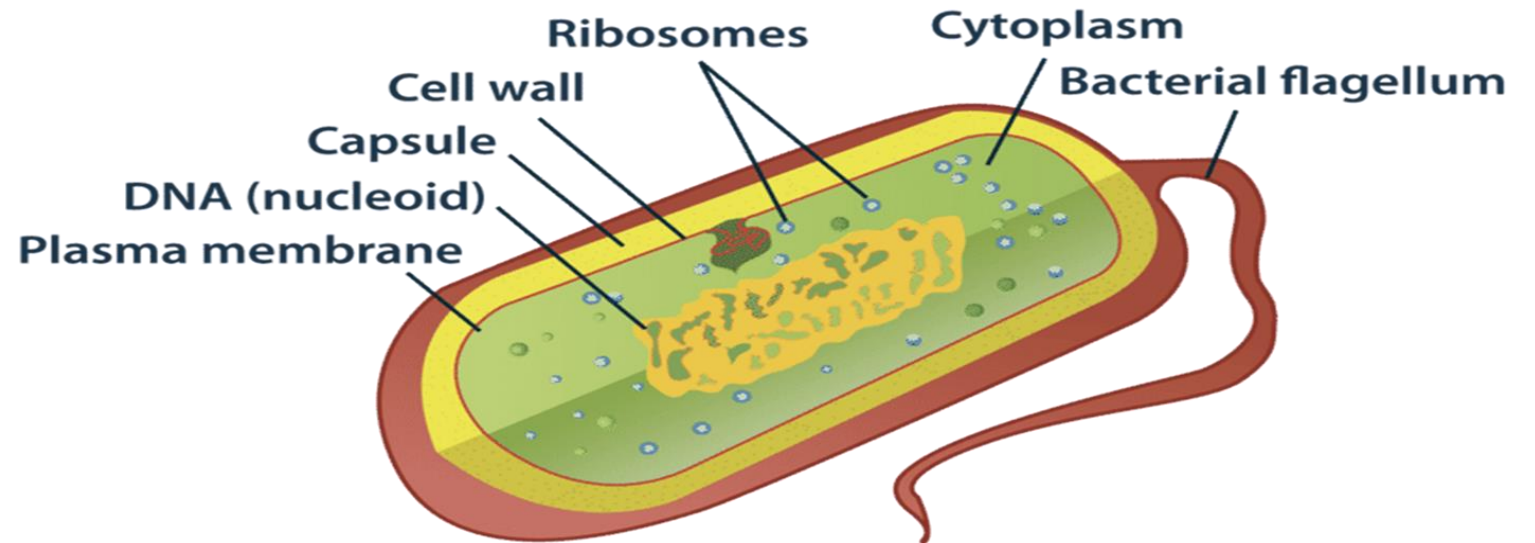
Organisms include
bacteria, protists, fungi, plants, animals



prokaryotic

A prokaryotic cell is a type of cell that does not have a true nucleus or membrane-bound organelles. Organisms within the domains Bacteria and Archaea are based on the prokaryotic cell, while all other forms of life are eukaryotic.

However, organisms with prokaryotic cells are very abundant and make up much of Earth's biomass.



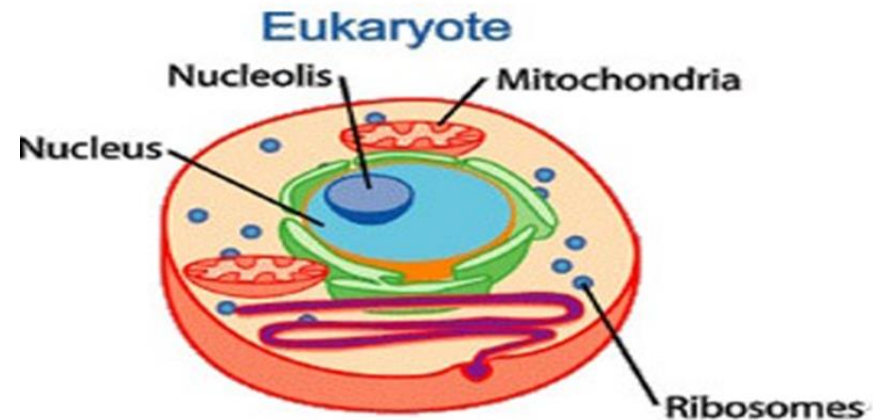
Prokaryotes refer to the smallest and simplest type of cells, without a true nucleus and no membrane-bound organelles. Bacteria fall under this category.

Some characteristics:

- Small (1-10 μm)
- DNA circular, unbounded
- Genome consists of single chromosome.
- Asexual reproduction common, not by mitosis or meiosis.
- No general organelles
- Most forms are singular
- Anaerobic

Eukaryotes

- Any cell or organism that possesses a clearly defined nucleus. The eukaryotic cell has a nuclear membrane surrounding the nucleus, where the well-defined chromosomes (the bodies containing the genetic material) are located.
- Eukaryotic cells also contain organelles, including mitochondria (cellular energy exchangers), Golgi apparatus (secretory apparatus), endoplasmic reticulum (a channel-like system of membranes within the cell), and lysosomes.



Eukaryotes are more complex in structure ,with nuclei and membrane-bound organelles

Some characteristics of eukaryotes are:

- Large (100 - 1000 μm)
- DNA in nucleus, bounded by membrane
- Genome consists of several chromosomes.
- Sexual reproduction common, by mitosis and meiosis
- Mitochondria and other organelles present
- Most forms are multicellular
- Aerobic

Prokaryotic and Eukaryotic Cells Venn Diagram

Prokaryotic Cells

- Small and simple
- 0.1 to 5.0 μm in size
- Unicellular
- Nucleus is absent
- Circular DNA
- Single haploid (n) chromosome
- Lack membrane-bound organelles
- Reproduce both sexually and asexually
- Cell division by binary fission
- Examples are bacteria and archaea cells

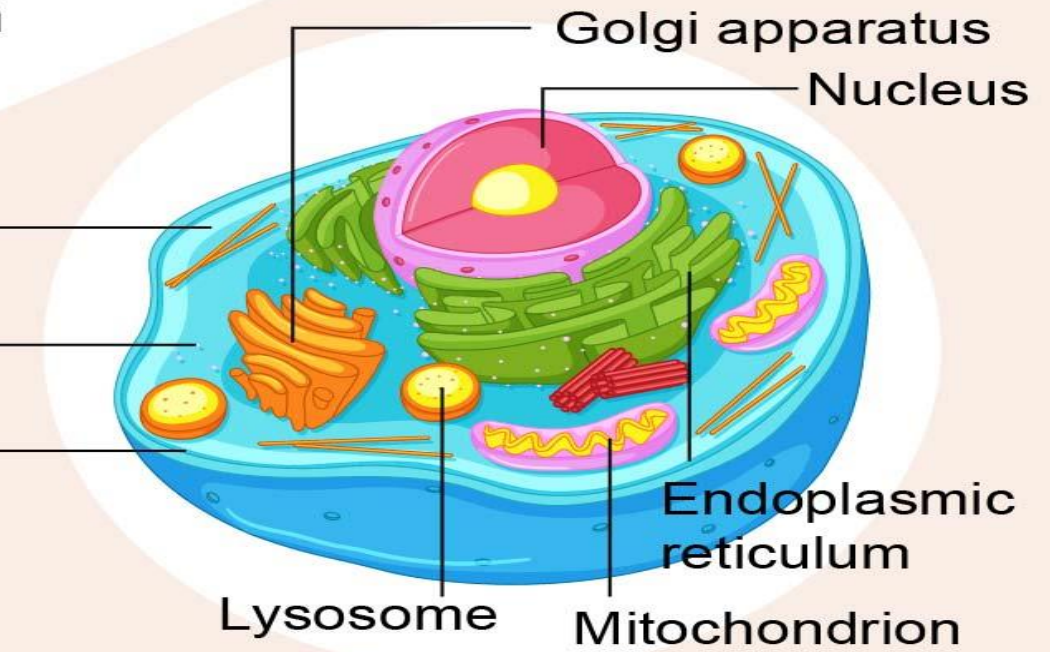
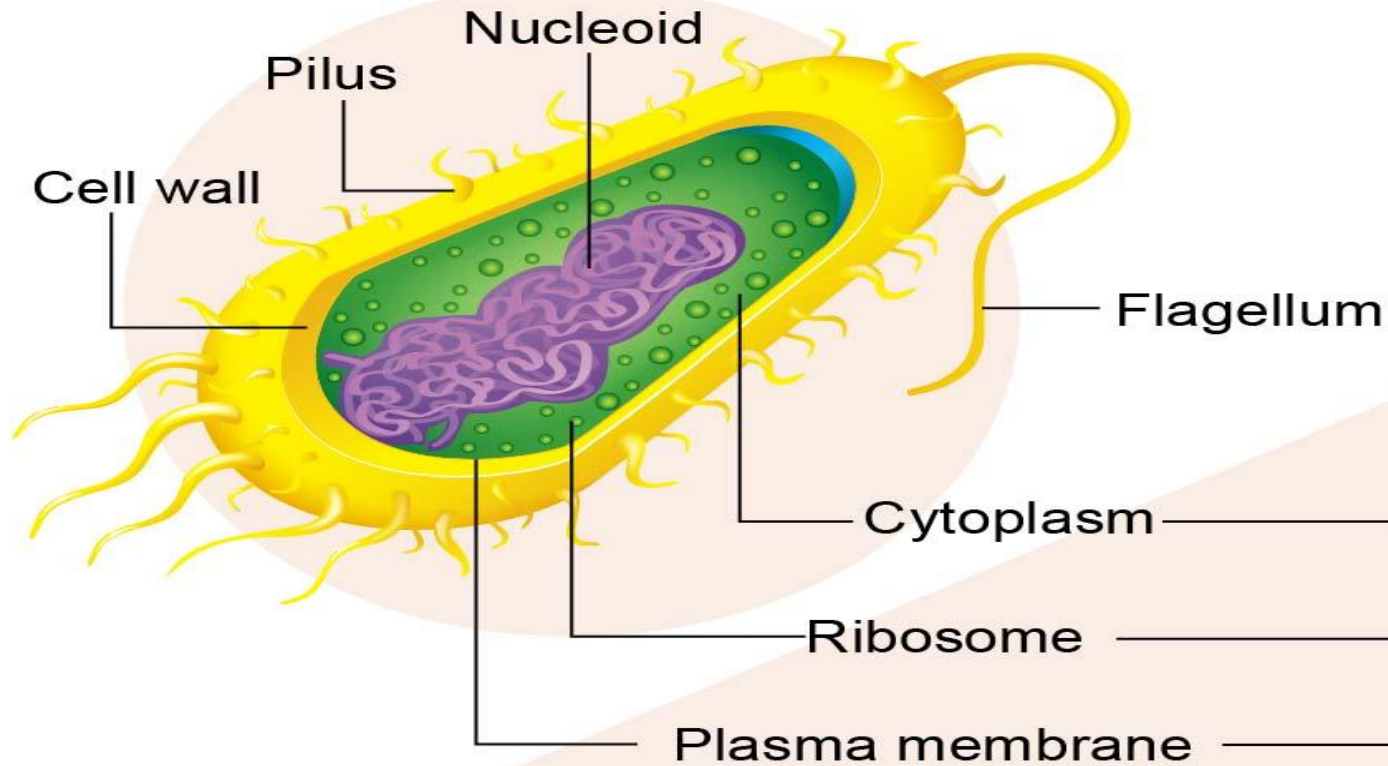
Similarities

- Have cell (plasma) membrane
- Have cytoplasm
- Have ribosomes
- Have DNA

Eukaryotic Cells

- Large and complex
- 10 to 100 μm in size
- Unicellular or multicellular
- Nucleus is present
- Linear DNA
- Paired diploid ($2n$) chromosome
- Has membrane-bound organelles
- Mostly reproduce sexually
- Cell division by mitosis
- Examples are plant and animal cells, including humans

PROKARYOTE CELL



EUKARYOTE CELL