Al-Mustaqbal University

Department of Optics Techniques

Biology

First stage

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prokaryotic and eukaryotic

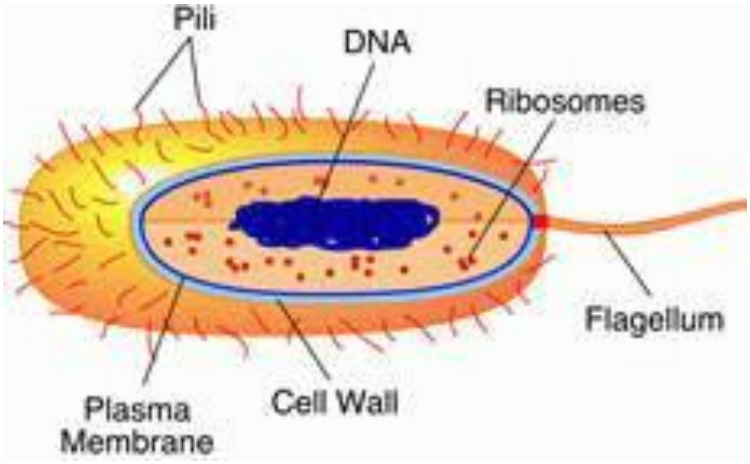
Prokaryotic and Eukaryotic Cells

What are Prokaryotic Cells.

*Unicellular organisms which don't have membrane-bound organelles like nucleus and mitochondria are referred to as prokaryotic cells.

* the domain in Bateria and Archaea.

Structure:



•Cell membrane: phospholipid bilayer that encloses the cytoplasm ,attachment point for the intracellular cell wall

• Cell wall: rigid, outside of the plasma membrane. Its function is to determine the shape of the organism . made of lipids, carbohydrates, and protein.

- Nucleoid: liken to nucleolus of eukaryotes, nucleoid contains DNA, genetic material of the cell, but it is not enclosed by any membrane.

- Chromosomes: contains genetic information. Chromosomes make up nucleoid. Prokaryotic cells are haploid.

- Flagella: tail-like organelles in charge of movements of cells.

- Pili: shorter and thinner than flagella, used also for motility and adherence.

Morphology of prokaryotic cells

Prokaryotic cells have a variety of shapes. These shapes are to describe ,classify and identify micro-organism. Some common shapes are:

- Cocci: spherical shape
- Bacilli: cylindrical or rod shape
- Spirilla: a curves rod long enough to form spirals
- Vibrio: a short curved rod (comma) shaped
- Spirochete: long helical shape

Cell division

•Prokaryotic cells reproduce through asexual reproduction. They usually are divided by binary fissions identical daughter cells) or budding (daughter cells grow out of the parent and gradually increase in size)

•Prokaryotic cells have their genes passed out completely to their daughter cells through mitosis. Genome is stored in chromosome.

What are Eukaryotic Cells

Eukaryotes are unicellular or multicellular organisms,which have membrane -enclosed organelles such as nucleus, mitochondria, golgi apparatus and chloroplasts in plants.Multicellular eukaryotes contain specialized tissues made by different types of cells.Eukaryotes can be identified under four kingdoms:Kingdom Protista, Kingdom Plantae, Kingdom Fungi, and Kingdom Animalia. eukaryotic cell is larger in size (10 to 100 μm) compared to prokaryotes. In eukaryotes, various cell types such as animal cells, plant cells and fungal cells can be identified.

possess a cell wall made up of cellulose, hemicellulose, pectin and chitin respectively.

Difference Between Prokaryotic And Eukaryotic Cells.

1.Prokaryotic Cell: Prokaryotic cells don't have nucleus and membranebound organelles

. Eukaryotic Cell: Eukaryotic cells have membrane-bound organelles including the nucleus.

2.Size of the cell Prokaryotic: These cells are normally 2 µm in diameter.

Eukaryotic Cell: These cells are normally 10 to 100 µm in diameter.

3.Nucleus Prokaryotic Cell: Prokaryotic cells have no true nucleus, no nuclear membranes

Eukaryotic Cell: Eukaryotic cells consist of a true nucleus with nuclear membranes and nucleoli.

4-Membranebound Organelles Prokaryotic Cell: Prokaryotic cells do not have membranebound organelles.

Eukaryotic Cell: Membranebound organelles such as mitochondria, chloroplast, endoplasmic reticulum and vesicles are present.

5-Flagella

Prokaryotic Cell: Flagella are made up of two proteins.

Eukaryotic Cell: Some cells without cell wall contain flagella such as sperm cells.

6-Cell Wall Prokaryotic Cell: Prokaryotic cells are mostly made up of peptidoglycans.

Eukaryotic Cell: Eukaryotic cells are made up of cellulose, chitin and pectin.

7-Cytoplasm Prokaryotic Cell: Prokaryotic cells are primitive cytoskeleton with no cytoplasmic streaming.

Eukaryotic Cell: Eukaryotic cells have complex cytoskeleton with cytoplasmic streaming.

8-Cell Division Prokaryotic Cell: Cell division occurs through binary fission.

Eukaryotic Cell: Cell division takes place through mitosis.

9-Sexual Reproduction Prokaryotic Cell: No sexual reproduction.

Eukaryotic Cell: Sexual reproduction happens through meiosis.

10-Examples Prokaryotic Cell: Bacteria and archaea

Examples Eukaryotic Cell: Protista, fungi, plants and animals .