Ultra structure of prokaryotic cell

Prokaryotic Cell Definition

Prokaryotic cells are cells that do not have a true nucleus or membrane-bound organelles. Organisms within the domains Bacteria and Archaea have prokaryotic cells, while other forms of life are eukaryotic. However, organisms with prokaryotic cells are abundant and make up much of Earth’s biomass.

Prokaryotic Cell Overview

Organisms that have prokaryotic cells are unicellular and are called prokaryotes. Prokaryotic cells can be contrasted with eukaryotic cells, which are more complex. Eukaryotic cells have a nucleus surrounded by a

nuclear membrane and also have other organelles that perform specific functions in the cell. A prokaryotic cell contains only a single membrane, which surrounds the cell as an outer membrane.

Prokaryotic cells do not have a true nucleus that contains their genetic material as eukaryotic cells do. Instead, prokaryotic cells have a nucleoid region, which is an irregularly-shaped region that contains the cell's DNA and is not surrounded by a nuclear envelope. Some other parts of prokaryotic cells are similar to those in eukaryotic cells, such as a cell wall surrounding the cell (which is also found in plant cells, although it has a different composition).

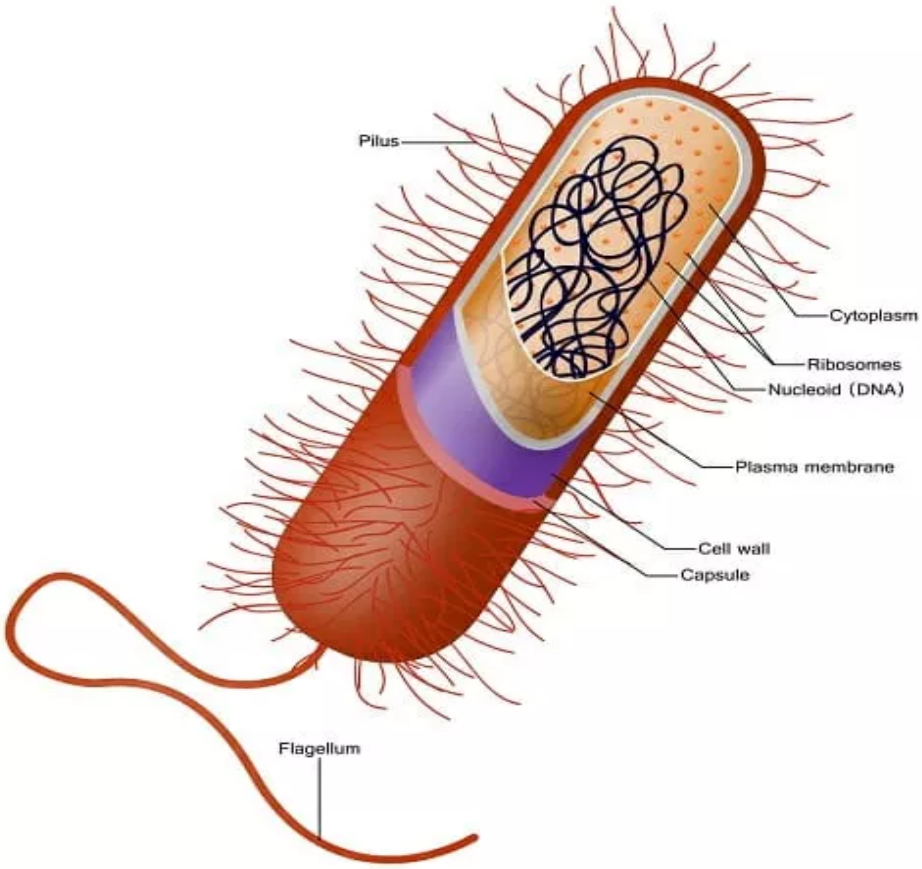
Like eukaryotic cells, prokaryotic cells have cytoplasm, a gel-like substance that makes up the "filling" of the cell, and a cytoskeleton that

holds components of the cell in place. Both prokaryotic cells and eukaryotic cells have ribosomes, which are organelles that produce proteins, and vacuoles, small spaces in cells that store nutrients and help eliminate waste.

Some prokaryotic cells have flagella, which are tail-like structures that enable the organism to move around. They may also have pili, small hair-like structures that help bacteria adhere to surfaces and can allow DNA to be transferred between two prokaryotic cells in a process known as conjugation. Another part that is found in some bacteria is the capsule. The capsule is a sticky layer of carbohydrates that helps the bacterium adhere to surfaces in its surroundings.

Prokaryotic Cell Diagram

The following image is a diagram of a



prokaryotic cell; in this case, a bacterium.Prokaryote cell

Characteristics of Prokaryotic Cells

All prokaryotic cells have a nucleoid region, DNA and RNA as their genetic material, ribosomes that make proteins, and cytoplasm that contains a cytoskeleton, which organizes and supports the parts of the cell. Prokaryotic

cells are simpler than eukaryotic cells, and an organism that is a prokaryote is unicellular; it is made up of only one prokaryotic cell.

Prokaryotic cells are usually between 0.1 to 5 micrometers in length (.00001 to .0005 cm). Eukaryotic cells are generally much larger, between 10 and 100 micrometers. Prokaryotic cells have a higher surface-area-to-volume ratio because they are smaller, which makes them able to obtain a larger amount of nutrients via their plasma membrane.

Prokaryotic Cell Parts

Unlike eukaryotic cells, prokaryotic cells have no distinct organelles bound by membranes. Instead, the many reactions the cell conducts happen within the cytoplasm of the cell. In fact, there are 2 main components that are present within all prokaryotic cells.

The first is a cell membrane. This is a layer of phospholipid molecules which separate the inside of the cell from the outside. While not present in all prokaryotes, many secrete a cell wall, used to protect and house the cell in an extra layer of proteins and structural molecules.

The second part found in all prokaryotic cells is DNA. DNA is the basic blueprint for all life and is found within all cells. In prokaryotes, the DNA often takes the form of a large circular genome. This can be compared to the organized chromosomes which are typically found within eukaryotes. This large circle of DNA directs which proteins the cell creates, and regulates the actions of the cell.

Other prokaryotic cells can have a large number of different parts, such as cilia and flagella to

help them move around. While these structures are similar in function to those found within eukaryotes, they often have a different structure. This suggests that the two types of cell have undergone very different selection processes and have independently involved the structures.