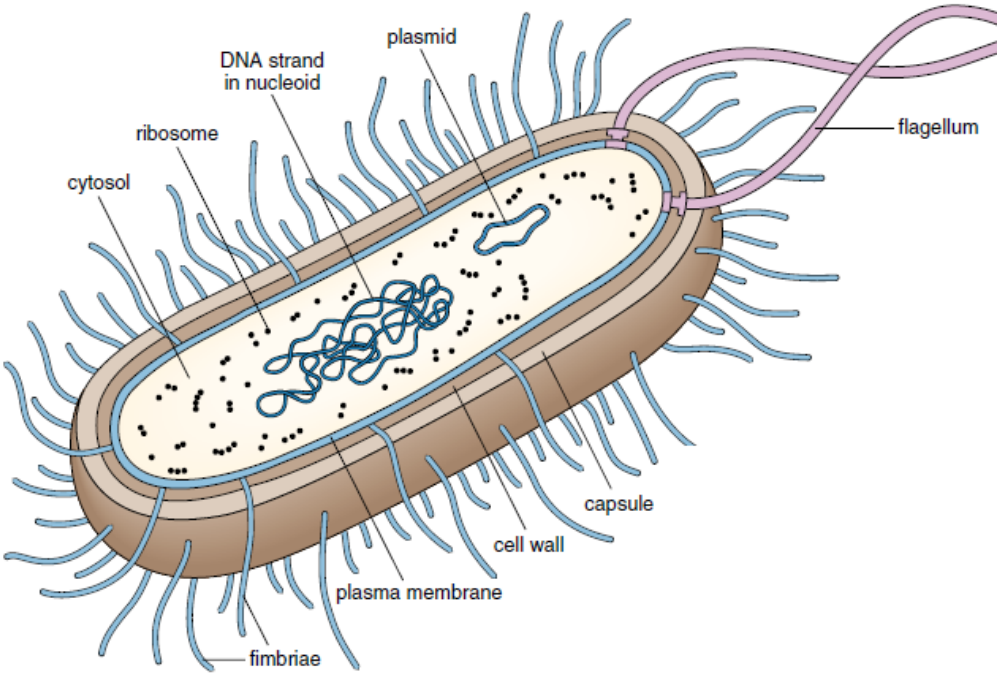
Kingdoms of Life – Monera

Kingdom Monera contains the **bacteria**, which are prokaryotes.

Structure of Bacteria

Prokaryotic cells are very small. They do have a chromosome, but it is contained within a **nucleoid,** which has no nuclear envelope; therefore, bacteria are said to lack a nucleus.

Many bacteria have DNA called **plasmids**. Bacteria have a cell wall surrounded by a **capsule**. Some bacteria move by means of **flagella**, and some adhere to surfaces by means of short, fine, hair like appendages called **fimbriae**.



Metabolism of Bacteria

1- Some bacteria are **obligate anaerobes**, unable to grow in the presence of oxygen.
2- Some other bacteria, called **facultative anaerobes**, are able to grow in either the presence or the absence of oxygen.
3- Most bacteria are **aerobic** and, like animals and plants, require a constant supply of oxygen to carry out cellular respiration.

Types of bacteria according to the source of energy:

1- Some bacteria are **autotrophic** by photosynthesis*;* they use light as a source of energy to produce their own food such as *Cyanobacteria*.
2- Most types of bacteria are **heterotrophic** by absorption. They are **saprotrophs,** organisms that carry on external digestion of organic matter and absorb the resulting nutrients across the plasma membrane.
3- Bacteria are often **symbiotic;** they live in association with other organisms. The nitrogen-fixing bacteria in the nodules of legumes, or the bacteria that live within our own intestinal tract.

Classification of Bacteria

Classification bacteria based on their shapes:

1- Rod (bacillus, pl., bacilli).
2- Round or spherical (coccus, pl., cocci).
3- Spiral (spirillum, pl., spirilli).

a. Bacilli in pairs b. Cocci in chains c. A spirillum with flagella

Classification bacteria based on Gram's staining

A- Gram-positive bacteria retain a dye-iodine complex and appear purple under the light microscope because have a thick layer of peptidoglycan on their cell wall.
B- Gram-negative bacteria do not retain the a dye-iodine complex and appear pink because have only a thin layer.

Reagents

1- Crystal violet	primary stain
2- Iodine solution/Gram's Iodine	mordant that fixes crystal violet to cell wall
3- Decolorizer	e.g. ethanol
4- Safranin	secondary stain
5- Water	preferably in a squirt bottle