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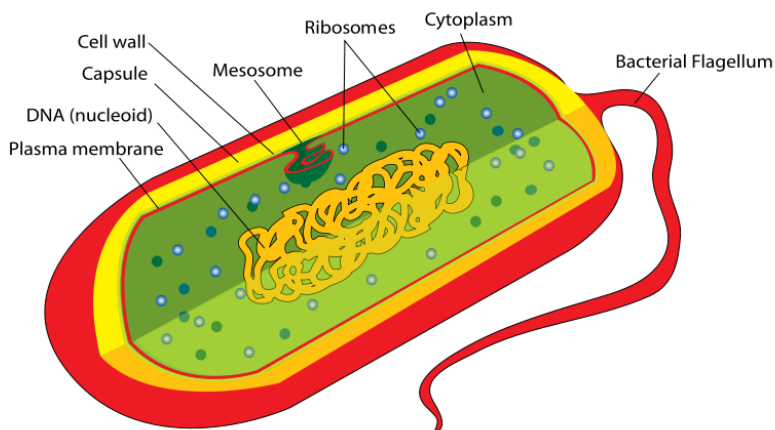
PROKARYOTIC AND EUKARYOTIC CELLS

Structural and functional differences between the cells of prokaryotes and eukaryotes

Any cell which is **eukaryotic** (literally meaning “having a true nucleus”) has a complicated internal structure containing many organelles, a lot of which will be membrane-bound and performing their own specific roles. The breakdown of cell components into individual tasks performed by separate organelles is referred to as **division of labour**.

Cells which are **prokaryotic (bacteria)** are much smaller than eukaryotic cells. Features of prokaryotes include:

- ✎ they have only one membrane, the cell surface (plasma) membrane, and do not contain any membrane-bound organelles such as chloroplasts or mitochondria
- ✎ they are surrounded by a cell wall, although it is made from a different substance to eukaryotic cell walls
- ✎ many prokaryotes are contained within a **capsule** which provides protection
- ✎ they contain ribosomes, but these are far smaller than eukaryotic ribosomes
- ✎ ATP production happens in specially infolded regions of the plasma membrane called **mesosomes**
- ✎ their DNA is found loose within the cytoplasm and is in the form of a single loop – this loop of DNA is often referred to as a **circular chromosome** or **bacterial chromosome** – many prokaryotic cells also contain many smaller loops of DNA called **plasmids**
- ✎ there is no membrane surrounding the DNA (unlike the nuclear envelope of eukaryotic cells), but the general area containing the DNA is called the **nucleoid**
- ✎ many prokaryotes have **flagella** (these are functionally the same as eukaryotic undulipodia, but are internally different)



There are many bacteria which are well known because of the diseases which they cause. Some strains of bacteria are antibiotic-resistant, such as MRSA. These resistant strains cause problems because the resistance is coded on plasmid DNA. Bacteria can share plasmids among one another, so resistance is easily passed on between prokaryotes.

However, there are some useful bacteria, for example, those used in food production, and skin being covered with a type of bacteria which prevents harmful pathogens getting into the body.