**COMPARATIVE CHARACTERS OF PROKARYOTES AND EUKARYOTES**

**PROKARYOTES**

A prokaryote is a [unicellular organism](https://en.wikipedia.org/wiki/Unicellular_organism) that lacks a [membrane](https://en.wikipedia.org/wiki/Biological_membrane)-bound [nucleus](https://en.wikipedia.org/wiki/Cell_nucleus) (karyon), [mitochondria](https://en.wikipedia.org/wiki/Mitochondrion), or any other membrane-bound organelle. The word *prokaryote* comes from the [Greek](https://en.wikipedia.org/wiki/Greek_language)  (*pro*) "before" and (*karyon*) "[nut](https://en.wikipedia.org/wiki/Nut_(fruit)) or [kernel](https://en.wikipedia.org/wiki/Seed)".Prokaryotes can be divided into two [domains](https://en.wikipedia.org/wiki/Domain_(biology)), [archaea](https://en.wikipedia.org/wiki/Archaea) and [bacteria](https://en.wikipedia.org/wiki/Bacteria). In contrast, species with nuclei and organelles are placed in the domain [Eukaryota](https://en.wikipedia.org/wiki/Eukaryote).

**EUKARYOTES**

Eukaryote is any [organism](https://en.wikipedia.org/wiki/Organism) whose cells have a [cell nucleus](https://en.wikipedia.org/wiki/Cell_nucleus) and other [organelles](https://en.wikipedia.org/wiki/Organelle) enclosed within [membranes](https://en.wikipedia.org/wiki/Biological_membrane). Eukaryotes belong to the [taxon](https://en.wikipedia.org/wiki/Taxon) Eukarya or Eukaryota. The presence of a nucleus gives eukaryotes their name, which comes from the [Greek](https://en.wikipedia.org/wiki/Greek_language) (*eu*, "well" or "true")and (*karyon*, "nut" or "kernel"). Eukaryotic cells also contain other membrane-bound organelles such as [mitochondria](https://en.wikipedia.org/wiki/Mitochondrion) and the [Golgi apparatus](https://en.wikipedia.org/wiki/Golgi_apparatus).

Eukaryotes [[Animals](http://en.wikipedia.org/wiki/Animal), [plants](http://en.wikipedia.org/wiki/Plant), [fungi](http://en.wikipedia.org/wiki/Fungus)] are different from one another; they do have three general parts that allow them to carry out these processes of life. These are:

1. Cell membrane, 2. Nucleus, 3. Other organelles. The organelles are very important to the cell’s functioning.

Organelles include:

1. **Mitochondria,** which transfer energy from organic compounds to ATP.
2. **Ribosomes** organize the synthesis of proteins (which is used to get energy).
3. **Rough endoplasmic reticulum** prepares proteins for export smooth endoplasmic reticulum regulates calcium levels, breaks down toxic substances, and synthesizes steroids
4. **Golgi body** processes and packages substances produced by the cell.
5. **Lysosomes** digest molecules.
6. Other little parts to the cells which aid in all of this. These include microfilaments, cilia, flagella (those two assist in transportation)
7. Nucleus.

Plant contain cell wall, the vacuole, and the plastid. All of these organelles are used to carry out the life processes

**Comparison of Prokaryotes and Eukaryotes**

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| **PROKARYOTES** | **EUKARYOTES** |
| * These have prokaryotic cells e.g. bacteria * Nucleus without membrane and chromosomes are present in cytoplasm, no mitosis occurs * Membrane bounded organelles are absent, mitochondria absent. * Ribosomes are small-sized * Cell-Wall composed of peptidoglycan or murine. Cellulose is absent. * Cell- membrane lack sterols compounds * Cells are small-sized and simple average diameter 0.5-10mm. * The prokaryotes are dependent on other similar cells and different cells in order to form what’s necessary for the life processes, while each eukaryotic cell has all the organelles it needs to carry   out the processes of life | * These have eukaryotic cells e.g. fungi, plants and animals. * Chromosomes are present in membrane-bounded nucleus , mitosis occurs * Membrane bounded organelles are present, mitochondria present. * Ribosomes are large-sized * Cell-Wall is composed of cellulose in plants and in fungi it is made up of chitin * Cell membrane having sterols compounds * Cells are larger and complex with average diameter 10-100mm. * This entire system carries out one important life process. This is the major difference between the prokaryotes and the eukaryotes |