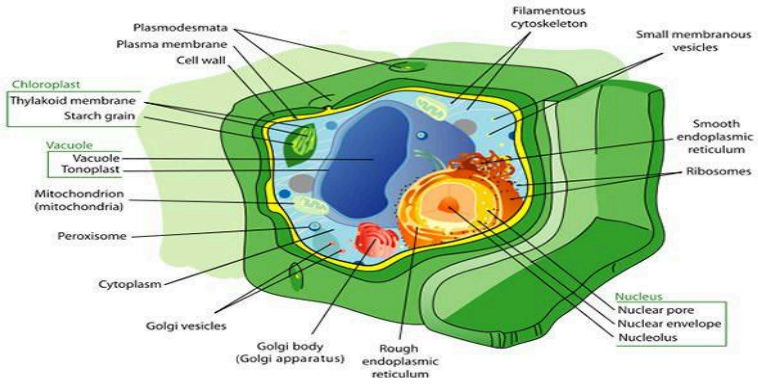
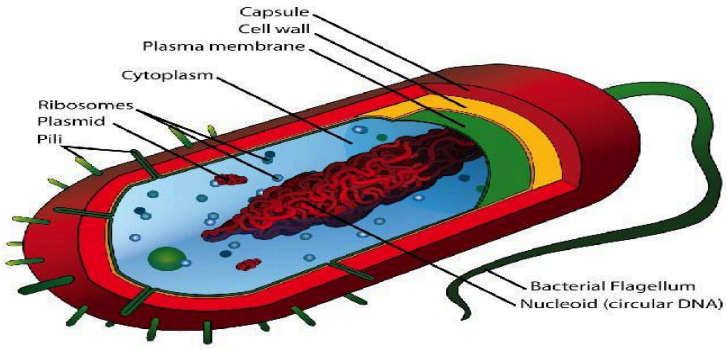
Eukaryotic Cell vs. Prokaryotic Cell

The distinction between **prokaryotes** and **eukaryotes** is considered to be the most important distinction among groups of organisms. Eukaryotic cells contain membrane-bound organelles, such as the nucleus, while prokaryotic cells do not. Differences in cellular structure of prokaryotes and eukaryotes include the presence of mitochondria and chloroplasts, the cell wall, and the structure of chromosomal DNA.

Prokaryotes were the only form of life on Earth for millions of years until more complicated eukaryotic cells came into being through the process of evolution.

Comparison chart





Differences — ***Similarities —***

	Eukaryotic Cell	Prokaryotic Cell
Nucleus	Present	Absent

Number of chromosomes	More than one	One--but not true chromosome: Plasmids
Cell Type	Usually multicellular	Usually unicellular (some cyanobacteria may be multicellular)
True Membrane bound Nucleus	Present	Absent
Example	Animals and Plants	Bacteria and Archaea
Genetic Recombination	Meiosis and fusion of gametes	Partial, undirectional transfersDNA
Lysosomes and peroxisomes	Present	Absent
Microtubules	Present	Absent or rare
Endoplasmic reticulum	Present	Absent
Mitochondria	Present	Absent
Cytoskeleton	Present	May be absent

DNA wrapping on proteins.	Eukaryotes wrap their DNA around proteins called histones.	Multiple proteins act together to fold and condense prokaryotic DNA. Folded DNA is then organized into a variety of conformations that are supercoiled and wound around tetramers of the HU protein.
Ribosomes	larger	smaller
Vesicles	Present	Present
Golgi apparatus	Present	Absent
Chloroplasts	Present (in plants)	Absent; chlorophyll scattered in the cytoplasm
Flagella	Microscopic in size; membrane bound; usually arranged as nine doublets surrounding two singlets	Submicroscopic in size, composed of only one fiber
Permeability of Nuclear Membrane	Selective	not present
Plasma membrane with steroid	Yes	Usually no

Cell wall	Only in plant cells and fungi (chemically simpler)	Usually chemically complexed
Vacuoles	Present	Present
Cell size	10-100um	1-10um

Examples of Prokaryotes

Prokaryotes are all single-celled organisms, most of which you know of as bacteria. For example, the famous (or infamous) Escherichia coli bacterium is a prokaryote, as is the streptococcus bacterium responsible for strep throat. The Streptomyces soil bacteria, from which the antibiotic streptomycin is derived, is also a prokaryotic organism. The entire subclass of archaea are also prokaryotes, mostly remarkable because of their ability to thrive in very harsh environments. An example of archaea is the Sulfolobus acidocaldarius archaebacterium that lives in extremely acidic mud pots in geothermally active areas.

Examples of Eukaryotes

Just about every organism you're familiar with is a eukaryote. Single celled organisms like yeast, paramecia and amoebae are all eukaryotes. Grass, potatoes, and pine trees are all eukaryotes, as are algae, mushrooms, and tapeworms. And, of course, moles, fruit flies, and you are also examples of eukaryotes.

Information from: http://www.diffen.com/difference/Eukaryotic_Cell_vs_Prokaryotic_Cell and http://education.seattlepi.com/three-examples-prokaryote-three-examples-eukaryote-4492.html