

COMPARING PROKARYOTES AND EUKARYOTES

Prokaryotes and Eukaryotes both have:

- DNA
 - Bacteria typically only have 1 chromosome of ~3000 genes, and it forms a circle
 - Bacteria also may have plasmids, small extra circles of DNA with just a few genes each
 - Eukaryotes (virtually every other living thing besides bacteria) have multiple linear strands. Humans have ~25,000 genes on 46 strands
- cell membranes
- ribosomes which perform protein synthesis
 - Bacterial ribosomes are slightly different than eukaryotic ribosomes. This is important when prescribing antibiotics that affect bacterial protein synthesis.
- cell wall is in fungus, plants, and bacteria; but not protists or animals
- cytoskeleton elements such as actin
 - Bacterial cytoskeletal elements are similar, but not the same proteins as found in eukaryotes.
- Photosynthetic bacteria contain chlorophyll pigments, but not chloroplasts
- Bacteria often contain electron transport chain proteins in their cell membrane, since they lack mitochondria

Eukaryotes also have:

- nuclear envelope that encircles the DNA
- Endoplasmic reticulum
- Golgi bodies
- Lysosomes
- Mitochondria (site of oxidative phosphorylation in eukaryotes – big ATP production!)
- Chloroplasts (plants only)