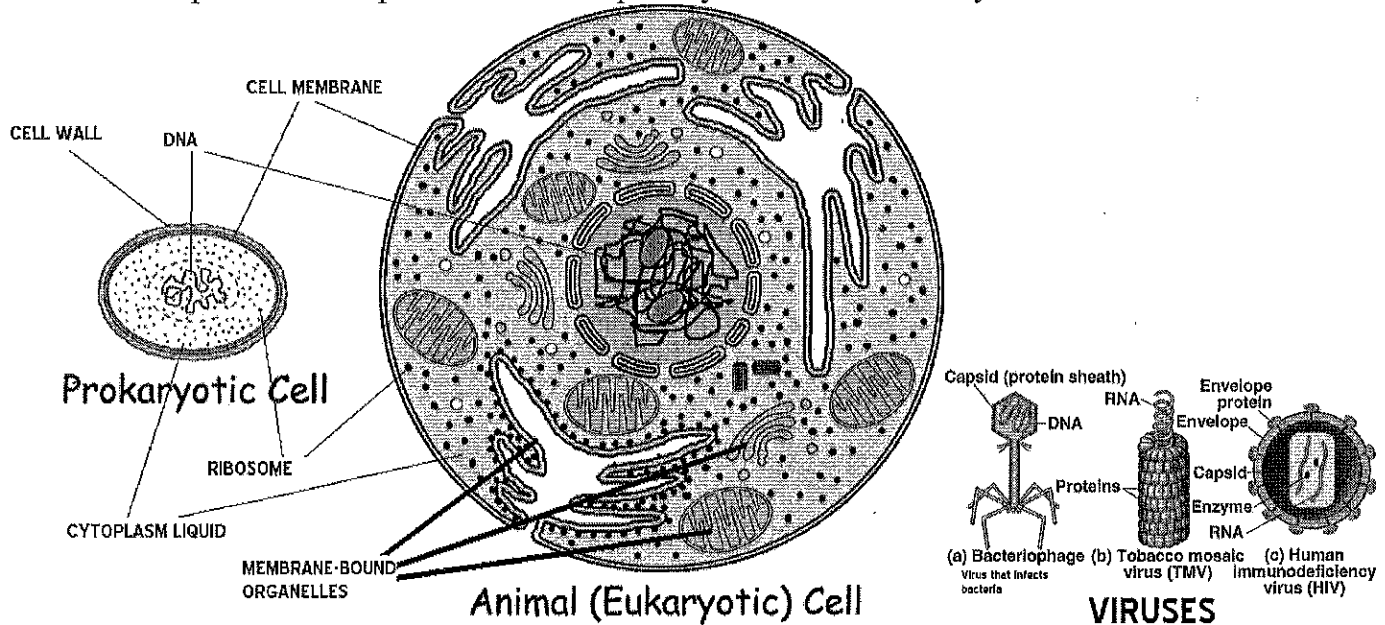


## Prokaryotic and Eukaryotic Cells

All organisms (living things) have at least one or more cells. Cells in our world come in two basic types, prokaryotic and eukaryotic. "Karyo" means "nucleus" of a cell. "Pro" means "before," and "eu" means "true," or "good." So "Prokaryotic" means "before a nucleus," and "eukaryotic" means "possessing a true nucleus." A nucleus is a protective compartment for DNA and is usually in the center of eukaryotes. This is a big hint about one of the differences between these two cell types. Prokaryotic cells have no nuclei, while eukaryotic cells do have true nuclei. Both have organelles (little cell parts) but eukaryote organelles are protected by membranes and so we call them membrane-bound organelles. This is far from the only difference between these two cell types, however.

Here's a simple visual comparison between a prokaryotic cell and a eukaryotic cell:



This particular eukaryotic cell happens to be an animal cell, but the cells of plants, fungi and protists are also eukaryotic. All bacteria have prokaryotic cells.

Despite their apparent differences, these two cell types have a lot in common. They perform most of the same kinds of functions, and in the same ways. Both are enclosed by plasma membranes (protective barrier that controls the movement of things in and out of the cell), filled with cytoplasm liquid, and loaded with small structures called ribosomes, for protein building. Both have DNA which carries the archived instructions for operating the cell. The DNA in the two cell types is precisely (exactly) the same kind of DNA, and the genetic code for a prokaryotic cell is exactly the same genetic code used in eukaryotic cells.

Some things which seem to be differences aren't. For example, the prokaryotic cell has a cell wall, and this animal cell does not. However, some eukaryotic cells do have cell walls like plant and fungi cells.

Eukaryotic cells are much larger and much more complex than prokaryotic cells.

Eukaryotic cells have a true nucleus, bound by a double membrane. Prokaryotic cells have no nucleus.

Eukaryotic DNA is linear; prokaryotic DNA is circular (it has no ends).

It is believed by scientists that prokaryotes were the first organisms on earth, appearing about 3.6 billion years ago according to prokaryote fossils. Then eukaryotes evolved from prokaryotes and the rest is history!