

Eukaryotic Cells Eukaryotic cells are more complex than prokaryotic cells. Although most eukaryotic cells are about 100 times larger than prokaryotic cells, they still have a high enough surface-to-volume ratio to survive. Fossil evidence suggests that eukaryotic cells first appeared about 2 billion years ago. All living things that are not bacteria are made of one or more eukaryotic cells. This includes plants, animals, fungi, and protists.

Eukaryotic cells have a nucleus and many other membrane-covered organelles. An advantage of having the cell divided into compartments is that it allows many different chemical processes to occur at the same time. A generalized eukaryotic cell is shown in Figure 17.

There is more DNA in eukaryotic cells than in prokaryotic cells, and it is stored in the nucleus. Instead of being circular, the DNA molecules in eukaryotic cells are linear.

All eukaryotic cells have a cell membrane, and some of them have a cell wall. Those that have cell walls are found in plants, fungi, and some unicellular organisms. The tables below summarize the differences between eukaryotic and prokaryotic cells.

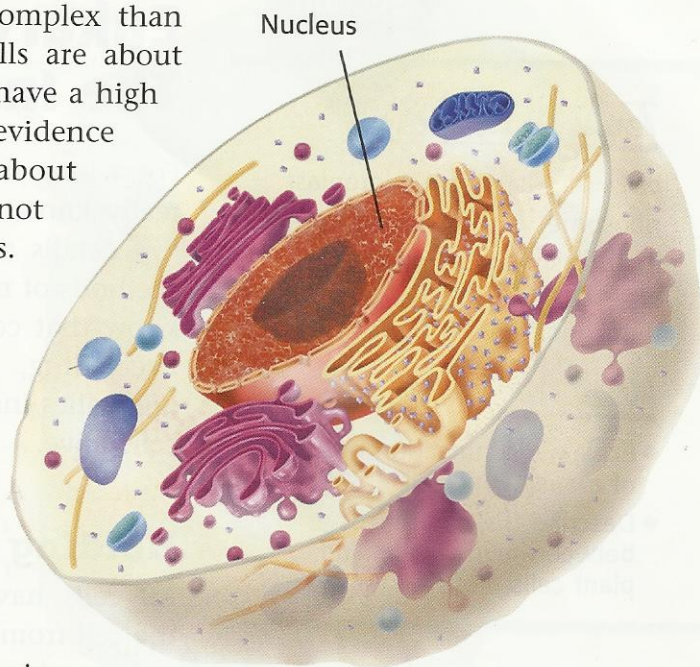


Figure 17 Eukaryotic cells contain a nucleus and many other organelles.

Prokaryotic Cells	Eukaryotic Cells
No nucleus	Nucleus
No membrane-covered organelles	Membrane-covered organelles
Circular DNA	Linear DNA
Bacteria	All other cells

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A new way to cure sick cells? See page 80.

REVIEW

1. What are the three parts of the cell theory?
2. What do all cells have in common?
3. What are two advantages of being multicellular?
4. If a unicellular organism has a cell wall, ribosomes, and circular DNA, is it eukaryotic or prokaryotic?
5. **Applying Concepts** Which has the greater surface-to-volume ratio, a tennis ball or a basketball? Explain your answer. What could be done to increase the surface-to-volume ratio of both?

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