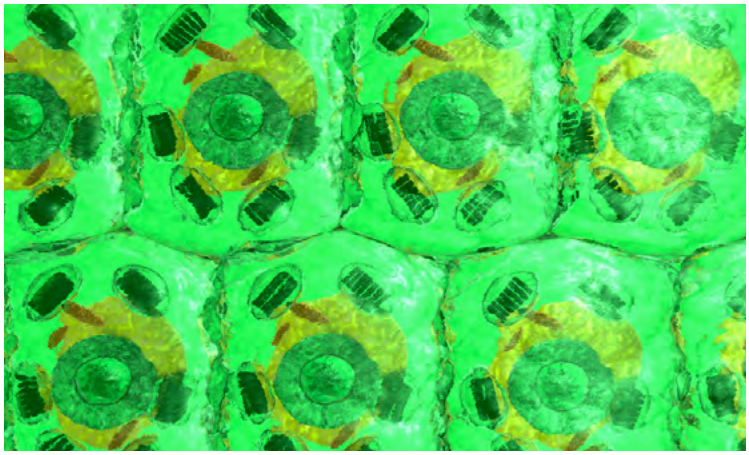
Chapter 3

The Cell



3.4 Eukaryotic Cells

You, the tree outside, and your dog are all eukaryotes, organisms composed of eukaryotic cells. In fact, most of the living things we encounter on a daily basis—all the plants, animals, and fungi—are eukaryotes.

Two typical eukaryotic cells are shown in Figure 3.8, one animal cell and one plant cell. The first thing you might notice is that all eukaryotic cells are surrounded by a cell membrane. The **cell membrane** separates the inside of the cell from the outside and is responsible for controlling what goes into and out of the cell. Plant cells also have a rigid cell wall outside the cell membrane that is made of cellulose and other materials. The cell wall helps to protect and support the cell.All eukaryotic cells also have a nucleus, a structure within the cell that contains the cell's DNA. The nucleus is surrounded by a double membrane.

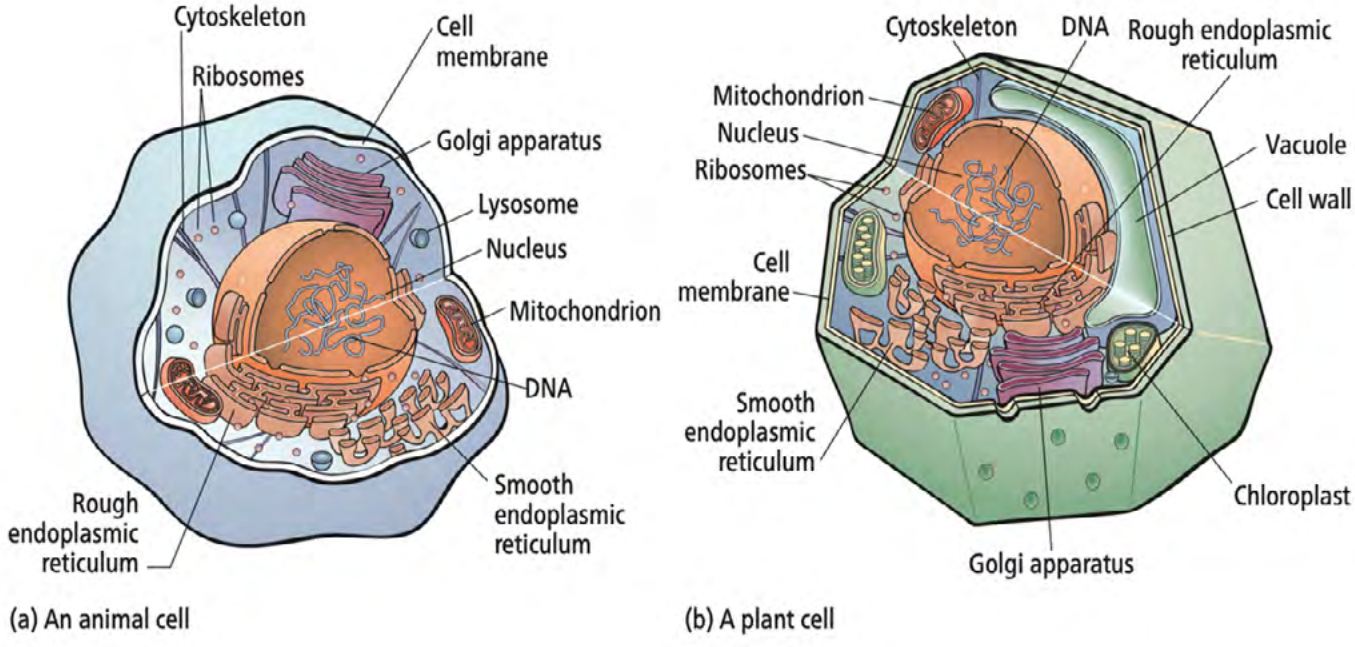


FIGURE 3.8

Eukaryotic cells have a cell membrane, a nucleus, and many different organelles. (a) This is a typical animal cell. (b) This is a typical plant cell. Plants cells have a cell wall outside the cell membrane.

The portion of the cell that is inside the cell membrane but outside the nucleus is called the cell's **cytoplasm**. The cytoplasm is crisscrossed by fibers of the *cytoskeleton*. The cytoskeleton helps the cell hold its shape. The cytoplasm of eukaryotic cells also contains many structures called *organelles*. These structures are called organelles because, like the organs of the body, each performs a specific function in the cell. Each organelle is surrounded by a membrane and is attached to the cytoskeleton. Some of the different organelles are shown in Figure 3.8. All these structures working in unison is what brings the cell to life.

READING CHECK

What is the function of the plant cell wall?

CHECK YOUR ANSWER

The cell wall of plant cells provides a rigidity that helps maintain the cell's shape and contributes to the building of the plant's structure.

Do you want to go on a virtual reality tour of a human cell? Check it out here:

http://naturedocumentaries.org/17217/virtual-tour-cell-xvivo-scientific-animation-2018/