

# Cell Organelles

## Key Words

<b>organelles:</b>	structures located within the cell cytoplasm that perform specific jobs
<b>mitochondria:</b>	organelles that supply the cell with energy
<b>carbohydrate:</b>	substance made of carbon, hydrogen, and oxygen
<b>endoplasmic reticulum:</b>	network of passageways through which materials flow within a cell
<b>ribosomes:</b>	organelles at which proteins are made
<b>vacuoles:</b>	organelles that store food, other materials needed by the cell, and wastes

## KEY IDEAS

The cytoplasm of a cell contains small structures called organelles. Each organelle performs a specific task. Together, the organelles carry out the life processes of a cell.

Scientists believe that certain structures in the body cells were once separate organisms. These cell structures are called mitochondria (singular, mitochondrion). For a number of reasons, scientists think that mitochondria evolved from a kind of bacteria. For example, mitochondria have bits of their own DNA. The structure of the DNA molecules is similar to that of bacteria. Mitochondria also contain many of the same enzymes found in bacteria. However, mitochondria do need the DNA found in the body to help it function. In this lesson, you'll learn how these structures and others work together to carry out the life processes of a cell.

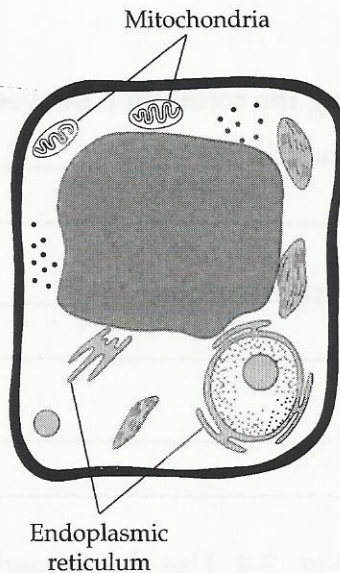
The small structures within a cell's cytoplasm are called **organelles** (awr-guh-NEHLZ). Each type of organelle performs a special job. The organelles help carry out the life processes of the cell.

**Mitochondria.** All living things need energy. Since a cell is a living thing, it too needs energy. **Mitochondria** (meyet-oh-KAHN-dree-uh) are rod-shaped organelles that provide the cell with energy. They are sometimes called the "powerhouses" of a cell. Mitochondria release the chemical energy stored in carbohydrates for the cell to use. A **carbohydrate** (kahr-boh-HEYE-drayt) is made of carbon, hydrogen, and oxygen. Carbohydrates may be simple sugars or chains of sugars called starches or cellulose.

The mitochondria change carbohydrates into water and carbon dioxide. Large amounts of energy are released by this change. The energy is stored in high-energy molecules. The cell uses these energy-rich molecules to carry out life processes. You will learn more about these molecules in Lesson 6.

**Endoplasmic Reticulum.** You have already discovered that materials move into and out of a cell through the cell membrane. But how do materials move within a cell? The **endoplasmic reticulum** (ehn-doh-PLAZ-mihk rih-TIHK-yuh-luhm) is a network of passageways within the cytoplasm. Materials move from one organelle to another through this folded membrane. You can see some of these folds in the diagram of the cell in Fig. 3-1.

Fig. 3-1



1. What is the endoplasmic reticulum?

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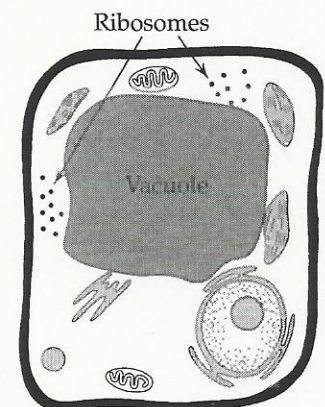


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**Ribosomes.** The organelles at which proteins are made are the **ribosomes** (REYE-buh-sohmz). The cell needs these proteins to carry out its processes. Many ribosomes are attached to the endoplasmic reticulum. Some ribosomes float freely in the cytoplasm.

**Vacuoles.** Another type of organelle found in cells are vacuoles. **Vacuoles** (VAK-yoo-ohlz) are sacs that store materials for the cell. Water, food, or waste products can be stored in a vacuole. Fig. 3-2 shows the cell's ribosomes and vacuole.

Fig. 3-2



2. How do ribosomes help the cell carry out life processes?

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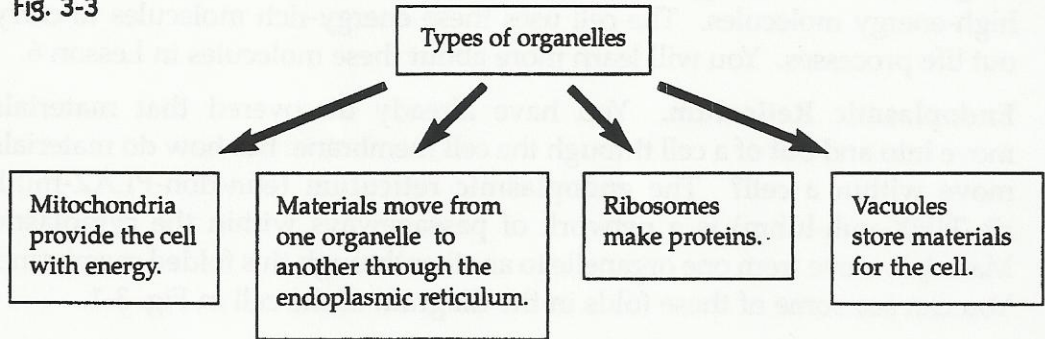


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**TAKE  
ANOTHER  
LOOK**

Fig. 3-3 shows the different types of organelles and their functions.

Fig. 3-3



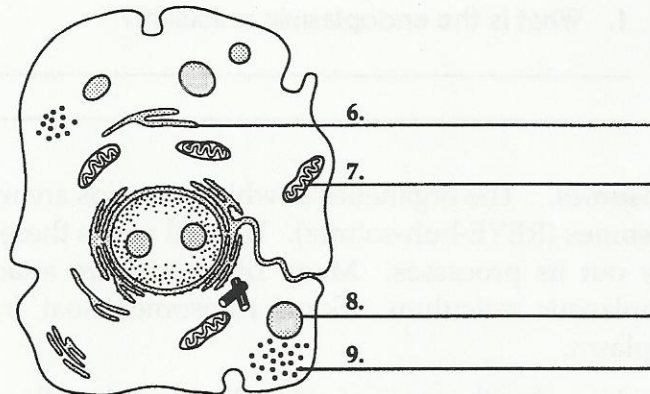
**Check Your Understanding**

Write a sentence explaining the connection between each pair of words.

3. carbohydrate, mitochondria \_\_\_\_\_  
\_\_\_\_\_
4. endoplasmic reticulum, ribosomes \_\_\_\_\_  
\_\_\_\_\_
5. vacuoles, organelles \_\_\_\_\_  
\_\_\_\_\_

Label the cell parts on Fig. 3-4. Use the following terms: *mitochondrion*, *endoplasmic reticulum*, *ribosome*, *vacuole*.

Fig. 3-4





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10. What are organelles? \_\_\_\_\_

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11. Why do you think mitochondria are sometimes called the "powerhouses" of a cell? \_\_\_\_\_

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12. How do vacuoles help a cell survive? \_\_\_\_\_

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13. Suppose the endoplasmic reticulum of a cell was damaged. What effect do you think this would have on the other organelles in the cell?

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14. Different kinds of cells have different numbers of mitochondria. Which do you think would contain more mitochondria: a very active cell or a barely active cell? Why?

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