

# Phagocytosis Encyclopedia Article

## Phagocytosis

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# Phagocytosis

Phagocytosis (from the Greek word *phagein*, meaning to eat, and *kytos*, meaning vessel) is the process in which cells engulf small solid particles, including, on occasion, whole cells. Because the cells are taking in solid particles, phagocytosis is sometimes called "cell eating."

Phagocytosis is one form of endocytosis, the process by which materials are engulfed into a cell. The other forms of endocytosis are pinocytosis and receptor-mediated endocytosis. In all three, there is an infolding of the cell membrane that pinches around substances, forming a vacuole or vesicle, and the materials are transported into the cytoplasm of the cell. Since all forms of endocytosis require energy to move the substances into the cell, some scientists consider them forms of active transport.

Some unicellular organisms such as amoeba and paramecia feed by phagocytosis. Their pseudopods or other cellular structures move around solid food particles that are engulfed into a vacuole or vesicle in the cytoplasm of the organism. The vacuole or vesicle then fuses with a lysosome, which is an organelle containing digestive enzymes. These digestive enzymes break down the food particles, and the useable nutrients such as sugars, amino acids, and nucleotides pass across the vacuole or vesicle membrane for use in the cytoplasm of the cell. In many less complex organisms, the remaining indigestible waste products are expelled from the cell by the process of exocytosis, when the vacuole or vesicle fuses with the cell membrane. Exocytosis is, in effect, the opposite of endocytosis.

Phagocytosis can occur in multicellular organisms as well. For example, some flatworms, cnidaria, and sponges obtain nutrients via phagocytosis. Phagocytosis even occurs within humans. Some types of specialized white blood cells called phagocytes (macrophages and leukocytes) in humans engulf invading bacteria and other foreign particles and destroy them. While phagocytosis is important for nutrition in some less complex organisms, these phagocytic cells are an important part of defense (immune) systems in some more complex organisms.