

Pinocytosis Encyclopedia Article

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Pinocytosis

Pinocytosis (from Greek *pinein*, "to drink" and *kytos*, "vessel") is the process in which cells engulf liquids. These liquids may or may not contain dissolved materials needed by the cell. Because the cells are taking in liquid, pinocytosis is sometimes called "cell drinking."

Pinocytosis is one form of endocytosis, the process by which materials are engulfed into a cell. The other forms of endocytosis are phagocytosis and receptor-mediated endocytosis. In all three, there is an infolding of the cell membrane, which then pinches around substances, forming a vacuole or vesicle, and materials are transported into the cytoplasm of the cell. If the vacuole or vesicle is small (diameter 0.1 μ m) it is called micropinocytosis. If the vacuole or vesicle is larger (diameter 1-2 μ m) it is called macropinocytosis. The vacuole or vesicle often contains water, salts, and other substances from the exterior of the cell, in addition to the material that caused pinocytosis to occur. Once inside the cell the vacuoles or vesicles either break apart into smaller bundles or join to form larger ones. At this point, the materials that were engulfed into the cell can be used or processed. Since all forms of endocytosis require energy some scientists consider them forms of active transport.

Because all extracellular dissolved solutes will be taken in, cells are not able to select the materials that are transported. Thus, pinocytosis is unspecific in the materials that are transported.

Pinocytosis occurs in many types of cells of multicellular organisms. For example, as a human egg cell matures in the ovary, it is surrounded by other cells. These cells pass nutrients to the egg cell, which engulfs them using pinocytosis. Pinocytosis has also been observed in white blood cells (macrophages and leukocytes), kidney cells, epithelial cells of the intestine, and plant root cells.