

Active and passive transport essay sample

[Science](#), [Chemistry](#)



Active and passive transport are the ways in which cells allow things to move into and out of the cell through the cell membrane. They include many different ways to transport things. Passive transport requires no expenditure of energy by the cell. However, Active transport requires ATPs which have energy in order for it to move something through the cell membrane. There are different types of transport to suit the sizes of molecules as well. Passive transport includes diffusion, osmosis, and facilitated diffusion. Diffusion is a net of movement of molecules from an area of high concentration to an area of low concentration that doesn't require energy. It moves molecules such as oxygen into the cells and carbon dioxide out of the cell. Osmosis is the diffusion of water across a semipermeable membrane. It occurs because of the concentration of a solute in a solution.

In a hypertonic solution the concentration of the solute is higher and water is moved into the cell through osmosis, but in a hypotonic solution the concentration of the solute is lower and water is moved out of the cell. In an isotonic solution the concentration is the same in and out of the cell, and water moves in and out evenly. In facilitated diffusion carrier proteins in the cell membrane move substances, such as glucose, into the cell without energy. Active transport is the transport of materials against a gradient that requires the use of cellular energy. Active transport uses carrier proteins that act as a pump to move ions and molecules across the membrane. The sodium-potassium pump in animals is an example of this. It moves sodium out of the cell and potassium into it using about one third of its total energy budget. In plants active transport allows the plant to absorb nutrients from the soil.

Active transport uses the energy that is stored in ATPs to function. Bulk transport is the movement of large molecules across the membrane in membrane bound sacs. Endocytosis, exocytosis, phagocytosis, and pinocytosis are examples of bulk transport. In Endocytosis the cell surrounds and takes in material from its surroundings. During phagocytosis the cell takes in water and during pinocytosis the cell takes in fluid. In exocytosis the cell moves waste and cell products out of the cell. Hormones and neurotransmitters are examples of cell products that would be sent out of the cell by exocytosis. Cells use active and passive transport to take in or release materials. Without it the cells would not be able to function properly and would die. The main difference between active and passive transport is that passive transport does not require energy, whereas active transport does. Cells have special types of active transport to move material that is too large through the cell membrane. The diffusion in passive transport depends on the type of solution the cell is in. Active and passive transport play a major role in the cell's ability to function.