

Simple diffusion does not require special membrane proteins for movement of molecules. However, other types of diffusion do require such proteins for the transport of molecules. Nonspecific facilitated diffusion is passive transport allowed by transmembrane proteins called permeases. In the case of nonspecific facilitated diffusion, these permeases allow a wide range of molecules that meet charge or size criteria to pass through their channel. Some facilitated diffusion is passive transport allowed by transmembrane proteins called permeases. In the case of specific facilitated diffusion, these permeases only allow specific types of molecules to pass through their channel. The channel contains a recognition element. If the molecule is not recognized, the channel will not open to allow the molecule to pass into the cell.

Osmosis is a special kind of passive diffusion that involves the movement of water molecules across a semipermeable membrane. Water passes through the phospholipid bilayer with some difficulty, but transmembrane channels can ease the passage of water through the membrane in a process called facilitated diffusion. Water plays a critical role in maintaining cell integrity. Water tends to move across the membrane from areas of high concentration to areas of low concentration, just like solutes. The difference is that water makes up most of the liquid, so a change in the total concentration of solutes is really the force that causes water to move. If the concentration of solutes outside the cell is high compared to the concentration inside the cell, water may leave the cell, causing the cell to shrivel up. Similarly, if the concentration of solutes inside the cell is high relative to the outside, water may move into the cell and can cause it to swell up and possibly burst.