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Sodium-Potassium Pump OR Sodium Pump.

In animal cells the concentration of Na^+ ion is about 0.01 (M) and K^+ ion is about 0.15 M. In body fluid (lymph and blood) the concentration of Na^+ and K^+ ions are about 0.15 M and 0.003 M respectively. To establish this concentration ~~gradient~~ in the cell is called concentration gradient ~~in the the~~ cell. The concentration gradient controls the function of nerve cells. The different ratio of Na^+ and K^+ ions out side and inside of the cell produces an electric potential across the cell membrane which is essential for the function of nerves and muscles cells.

The process of moving sodium and potassium ions across the cell membrane against their concentration gradient, ~~the~~ require energy ~~ener~~ hence it is an active transport. The energy required is supplied by the break down of ATP to ADP. It involves an enzyme known as Na^+/K^+-ATPase. It is a protein pump found in the cell membrane of neurons (nerve cell). It has three binding sites of Na^+ ions and two binding sites for K^+ ions. Sodium ions bind to the pump ~~and~~ with a phosphate group from ATP, causing it to change in its shape

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In this new shape, the pump releases the three sodium ions and now binds to two potassium ions. Once the potassium ions are bounded to the pump, the phosphate group detaches. This in turn causes pump to release the two potassium ions into the cytoplasm. The hydrolysis of one ATP molecule to ADP provides enough energy to move three Na^+ ions out of the cell and two K^+ ions and one H^+ ion back into the cell.