4.3 Types of Cell Uptake/Transport

There are a number of different forms of uptake/transport utilized by your body. These can be classified as passive or active. The difference between the two is whether energy is required and whether they move with or against a concentration gradient. Passive transport does not require energy and moves with a concentration gradient. Active transport requires energy to move against the concentration gradient.

The energy for active uptake/transport is provided by adenosine triphosphate (ATP), which is the energy currency in the body. ATP stores energy in its high-energy phosphate bonds. The structures of adenosine and phosphate are shown below.

Figure 4.31 Structures of adenosine (left) and phosphate (right)

Tri- means three, so ATP is adenosine with three phosphate groups bonded to it, as shown below.

Figure 4.32 Structure of adenosine triphosphate (ATP)
The following video shows the ATP cycle. Phosphorylation is the formation of a phosphate bond. Dephosphorylation is removal of a phosphate bond. Phosphorylation requires energy to create the bond. Thus, when this bond is broken, energy is released.

Web Link

Video: ATP Cycle (2:01)

The concentration gradient is a way to describe the difference between the concentration of the solute outside of a cell versus the concentration inside of a cell. A solute is what is dissolved in a solvent in a solution; the more solute the higher the concentration. Moving with the gradient is moving from a region of higher concentration to an area of lower concentration. Moving against the gradient is moving from an area of lower concentration to an area of higher concentration.

Subsections:

4.31 Passive Uptake/Transport
4.32 Active Uptake/Transport

References & Links

Video

ATP Cycle - http://www.youtube.com/watch?v=Lx9GklK0xQg