

CELLULAR RESPIRATION

alcohol ATP carbon cristae cytoplasm dioxide electrons energy lactic
matrix mitochondria oxygen pyruvic six sugar three two water

Glycolysis

Glycolysis literally means "sugar-splitting." In glycolysis, the 6-carbon sugar glucose is split into 2 molecules of pyruvate, also called Pyruvic acid. This process produces a net gain of 2 ATP molecules. The resulting molecules of pyruvate each have 3 carbon atoms.

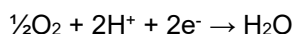
Glycolysis takes place in the cell's cytoplasm. The remainder of cellular respiration takes place in organelles called mitochondria.

The Krebs Cycle

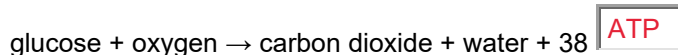
The Krebs Cycle takes place in the fluid-filled area inside the inner membrane of the mitochondria known as the matrix. Some ATP and other energy carrying molecules are produced here. The gas Carbon Dioxide is a byproduct of this process.

The Electron Transport Chain

Most of the ATP or energy is produced in this last step of cellular respiration. Electron transport takes place in the infoldings of the inner-membrane of the mitochondria. These infoldings are called Cristae. At the end of electron transport, Oxygen combines with hydrogen ions and electrons (e⁻) to form water.



Overall Process



Fermentation

In the absence of Oxygen, the cell resorts to **anaerobic** metabolism. In animal cells, pyruvate is converted to lactic acid. In yeast and bacteria, the pyruvate is often converted to ethanol. In both cases, no new ATP is produced, so the net production of the energy-carrying molecule is only the 2 molecules of ATP produced in glycolysis.

