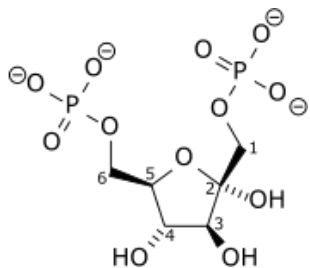


Glycolysis

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What is Glycolysis?

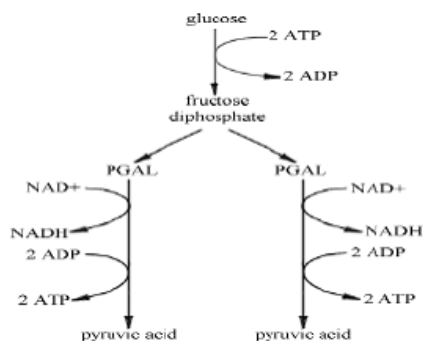


The sequence of reactions in the aerobic oxidation of glucose is an overview of the energy yielding reactions of a cell.

Glycolysis, also called the Krebs cycle, and the electron –transport system (ETS) are each a series of enzyme-controlled reactions that generate extra energy from the chemical bonds in a glucose molecule.

During glycolysis, glucose is split into pyruvic acid and ATP and electrons are released.

Definition



The breakdown of food molecules into simple sugars which take place in a human

body is called [glycolysis](#). It means splitting of sugar molecule into two molecules of pyruvic acid is called glycolysis. It generally takes place in the cytoplasm and the pathway used is called the anaerobic pathway.

The most common type of glycolysis is the *Embden-Meyerhof-Parnas* pathway (EMP pathway), which was first discovered by [Gustav Embden](#), [Otto Meyerhof](#) and [Jakub Karol Parnas](#).

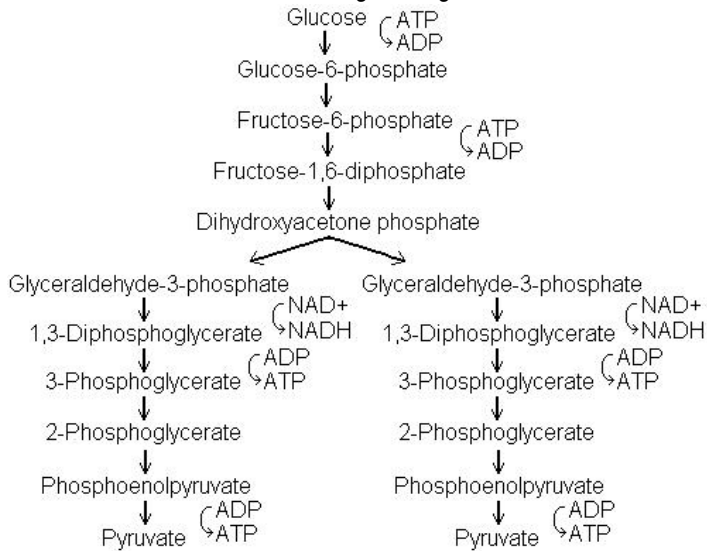
Steps for Glycolysis

Glycolysis is a definite sequence of ten reactions involving ten intermediate compounds (one of the steps involves two intermediates).

1. [Glucose](#) is converted into glucose 6-phosphate through phosphorylation under the enzyme hexokinase and ATP molecule.
2. Glucose-6-Phosphate is converted into Fructose-6-phosphate in the presence of enzyme phospho glucoisomerase
3. [fructose](#)-6-phosphate yields Fructose-1, 6-disphosphate
4. Fructose-1, 6-diphosphate splits into 3 carbon sugar phosphates-dihydroxyacetone phosphate and 3-phosphoglyceraldehyde.

5. 3-phosphoglyceraldehyde is converted into 1, 3-disphosphoglyceric acid
6. When 1, 3-diphospho-glyceric acid is converted into 3-phosphoglyceric acid ATP is released.
7. Later 3-phosphoglyceric acid is converted into 2-phosphoglyceric acid
8. 2-phosphoglyceric acid is converted into 2-phosphoenol pyruvic acid in the presence of enzyme aldolase.
9. 2-phosphoenol pyruvic acid is converted into pyruvic acid with help of enzyme pyruvate kinase
10. At last 2 molecules of [ATP](#) are released.

Flow chart on Glycolysis:



Fermentation

[Fermentation](#) generally means respiration of an organism without the use of oxygen. Some bacteria and yeast often spoil food they live. Some are useful to mankind as they produce [antibiotics](#), enzymes, washing powder, alcohol, yoghurt etc. To make use of these we need to grow the microbes large scale. This is called bio-processing and involves culturing them in the nutrient field in a stainless steel vessel called bioreactor or fermentor.

Glycolysis - a Quick Summary

1. Takes place in the cytoplasm of a cell.
2. Requires the use of 2 ATPs.
3. Ultimately results in the formation of 4ATPs.
4. Results in the formation of 2NADHs.
5. Results in the formation of 2 molecules of pyruvic acid.

Difference between Glycolysis and Fermentation:

Glycolysis is the path where glucose is broken into pyruvate and fermentation is the process of formation of lactic acid by breaking pyruvates. Fermentation produces reducing agents without oxygen. Glycolysis appears before fermentation. They both occur in the cytoplasm.

What is Electron transport chain?

Want to know more about Glycolysis? [Click here](#) to schedule a live help with an eTutor!

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Reference Links:

- http://en.wikipedia.org/wiki/Metabolic_pathway
- <http://en.wikipedia.org/wiki/Glycolysis>
- http://en.wikipedia.org/wiki/Anaerobic_respiration
- http://en.wikipedia.org/wiki/Cellular_respiration
- http://en.wikipedia.org/wiki/Aerobic_organism
- <http://www.youtube.com/watch?v=oAOVst8jsd8>

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