Definition ❖ Glycolysis

{Gr. glycose, sweet+ lysis, dissolution}

Glycolysis is defined as the essential metabolic pathway involves the oxidative breakdown of one glucose into to two pyruvate with the capture of some energy as ATP and NADH.

Glycolysis is universally found in organisms. It takes place within the cytosol outside the mitochondria. It can take place with or without oxygen. In the presence of oxygen glycolysis is the first stage of cellular respiration. In the absence of oxygen glycolysis allowed cells to make small amount of ATP through the process of fermentation. In aerobic respiration the end product is pyruvate and in an anaerobic respiration the end product is lactic acid.

Glycolysis is important in the cell because glucose is the main source of fuel for tissues in the body. The overall reaction of glycolysis which occurs in the cytoplasm is simply represented as:

Glycolysis is a central pathway with many of its intermediate providing branch point to other pathways. Thus, the intermediates of glycolysis are useful for the synthesis of amino acid and fats.

Process of Glycolysis

In the sequence of reactions of glycolysis, three main phases involved which contain different steps. They are

1. *Energy investment phase*
2. *Splitting phase*
3. *Energy-harvesting phase*

Each phase involved different enzymes. 10 different enzymes are involved in whole process.

The Krebs cycle turns twice for each original glucose molecule. Therefore, the input and output of the Krebs cycle per glucose molecule are as follows:

Inputs	***Outputs***
2 Acetyl groups	*4 CO2*
2 ADP+ 2 P	*2 ATP*
6 NAD+	*6 NADPH*
2 FAD	*2 FADH2*