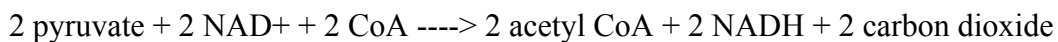


Lecture 19

TCA Cycle

1. How pyruvate is converted to acetyl-CoA which is a precursor for TCA cycle?

Answer: The pyruvic molecules formed in glycolysis enter the mitochondria, where they are converted to acetyl coenzyme A (acetyl CoA). In this complex series of reactions, pyruvate undergoes oxidative decarboxylation. First, a carboxyl group is removed as carbon dioxide, which diffuses out of the cell. Then the two-carbon fragment remaining is oxidized, and the hydrogens that were removed during the oxidation are accepted by NAD⁺. Finally, the oxidized two-carbon fragment, an acetyl group, is attached to coenzyme A, which is manufactured in the cell from one of the B vitamins, pantothenic acid. The reaction is catalyzed by a multienzyme complex that contains several copies of each of three different enzymes. The overall reaction for the formation of acetyl coenzyme A can be stated as follows:



2. In which organelles glycolysis is taking place and which one is a site for TCA cycle?

Answer: Glycolysis is taking place in the cytoplasm of the cell and TCA cycle takes place in the matrix of the mitochondrion.

3. In TCA cycle which step is called substrate level phosphorylation?

Answer: The Krebs cycle is oxidative respiration, one more instance of substrate-level phosphorylation occurs as Guanosine triphosphate (GTP) is created from GDP by

transfer of a phosphate group during the conversion of Succinyl CoA to Succinate. This phosphate is transferred to ADP in another substrate-level phosphorylation event.

4. Where is site for succinate dehydrogenase?

Answer: Succinate dehydrogenase or succinate-coenzyme Q reductase (SQR) or Complex II is an enzyme complex, bound to the inner mitochondrial membrane of mammalian mitochondria and many bacterial cells.

5. Critically discuss can TCA cycle takes place in anaerobic system?

Answer: TCA cycle always take place in aerobic system. In anaerobic system pyruvate is converted to lactate or ethanol.