

Study Material.

Botany

4th Semester

Plant Metabolism - CC-VIII

β - Oxidation of fatty acids

Mitochondrial oxidation of fatty acids takes place in three stages. In the first stage, β -oxidation of fatty acids undergo oxidative removal of successive two-carbon units in the form of acetyl Co-A, starting from the carboxyl end of the fatty acyl chain.

In the second stage of fatty acid oxidation, the acetyl groups of acetyl Co-A are oxidised to CO_2 in the Citric acid cycle, which also takes part place in the mitochondrial matrix. Acetyl Co-A derived from fatty acids thus enters a final common path way of oxidation with the acetyl Co-A derived from glucose via glycolysis and pyruvate oxidation.

Place of Reaction - Cytosol

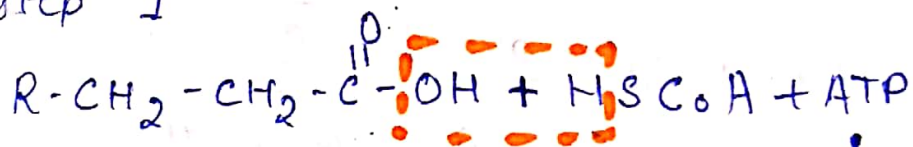
β -oxidation occurs in 3 following steps -

A. Activation of fatty acid chain

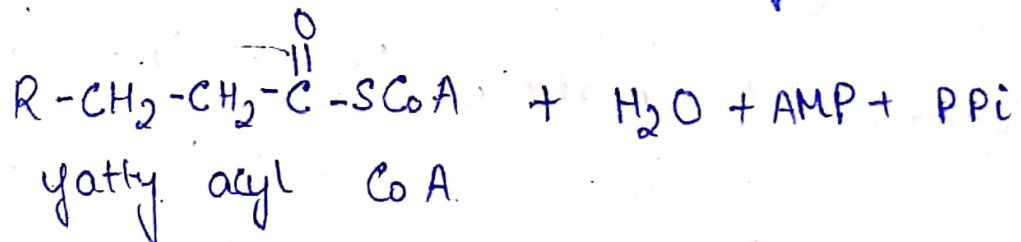
B. Transport or Transfer of activated fatty acid chain from cytosol to mitochondrial matrix through carrier protein (carnitine shuttle) located in mitochondrial matrix.

C. β -oxidation proper

A Step 1

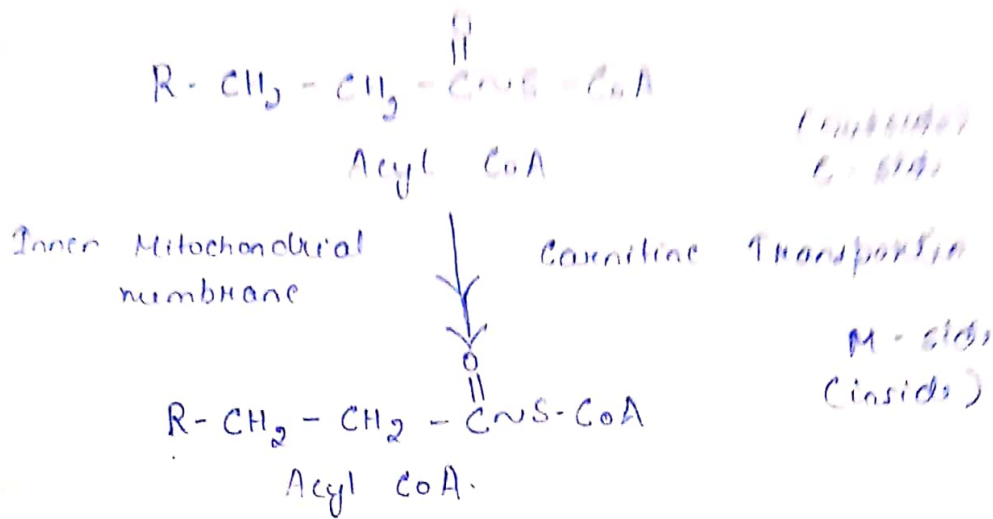


↓ Thiokinase



In these step, Fatty acid with the help of enzyme Thiokinase combine with coenzyme (Co-A)

B.



C. β -Oxidation proper.

For complete breakdown of activated fatty acid, following reaction steps involved —

- i. Oxidation
- ii. Hydration
- iii. Oxidation
- iv. Splitting.

