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MATRIC NO: 18/MHS01/171

DEPARTMENT: ANATOMY

COURSE: BCH 204

### ASSIGNMENT

Describe the 3 stages of beta oxidation. (Show pathways where necessary)

### ANSWER

#### Stage 1- Occurs in Cytosol

Upon entering the cytoplasm, fatty acids are activated by the attachment of coenzyme A.

#### Stage 2- Transport of fatty acid to mitochondria

Acyl CoA linked fatty acids are transferred to carnitine

The carnitine shuttle transport acyl carnitine into mitochondria

In mitochondria, the fatty acid is transferred back to CoA, which is the substrate for  $\beta$ -oxidation (fatty acid degradation)

#### Stage 3

Oxidation of the  $\beta$  carbon, catalyzed by acyl CoA dehydrogenase, generates trans- 2-enoyl CoA and FADH<sub>2</sub>.

Hydration of trans-2-enoyl CoA hydratase yields L-3hydroxyacyl CoA and NADH.

Oxidation of L-3-hydroxyacyl CoA by L-3-hydroxyacyl dehydrogenase generates 2-ketoacyl CoA and NADH.

Thiolysis: Cleavage of the 3-ketoacyl CoA and a fatty acid chain two carbons shorter.

## $\beta$ -oxidation – first of three stages of fatty acid oxidation

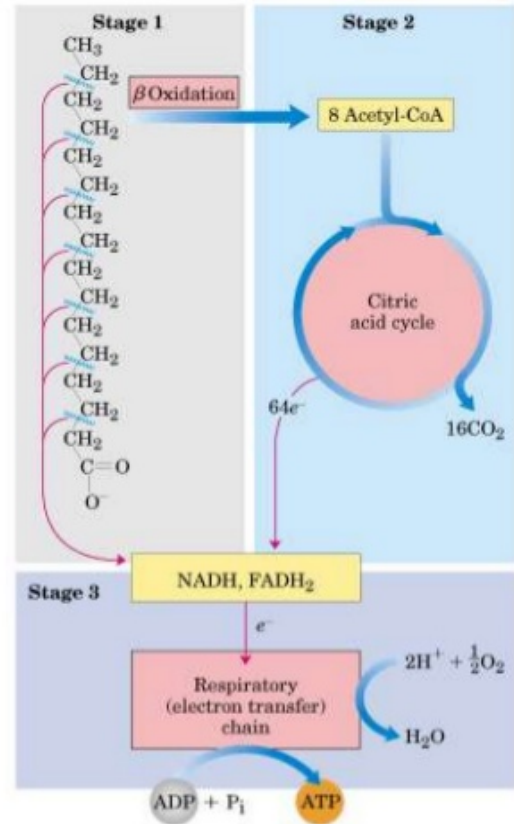
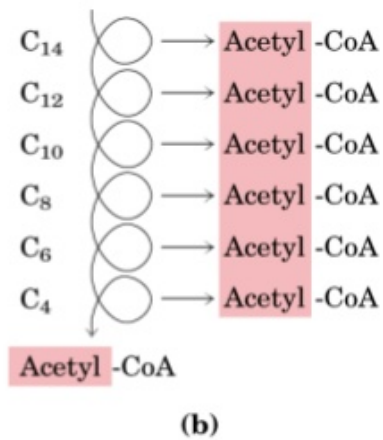


DIAGRAM FOR THE PATHWAYS OF THE 3 STAGES OF  $\beta$  OXIDATION