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# **TOPIC-9: METABOLISM OF LIPIDS**



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# *de novo* Synthesis of Fatty Acids

- ❖ Fatty acid synthesis starts with the carboxylation of acetyl CoA to malonyl CoA by **acetyl CoA carboxylase**, with the consumption of ATP.
- ❖ In a subsequent reaction, CoA is exchanged for **acyl carrier protein (ACP)**. ACP contains a serine residue to which a pantetheine residue is linked via a phosphate group. Since the pantetheine residue is also a functional constituent of CoA, ACP can be regarded as a CoA, which is covalently bound to a protein.



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# Glyoxylate Cycle

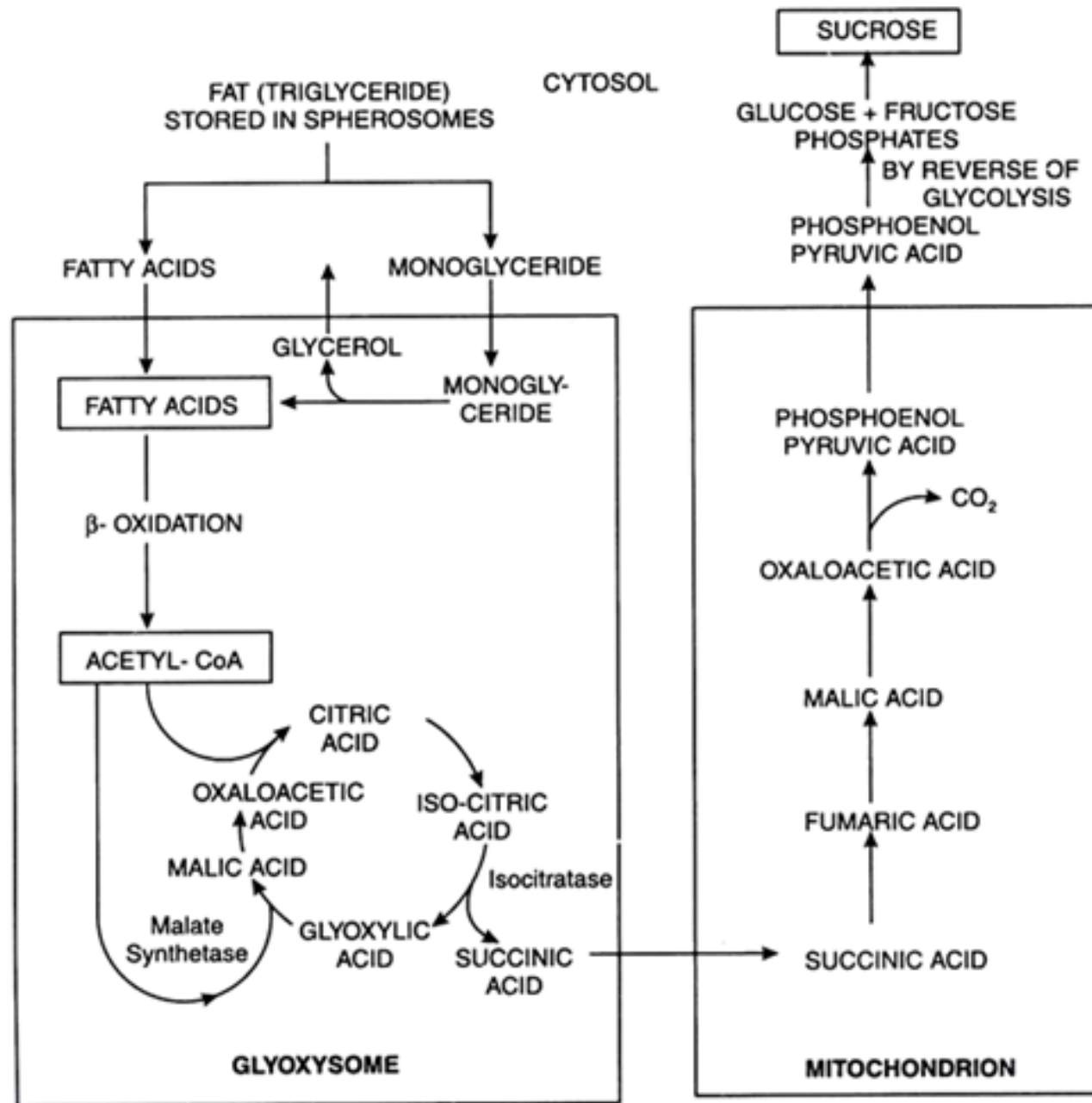


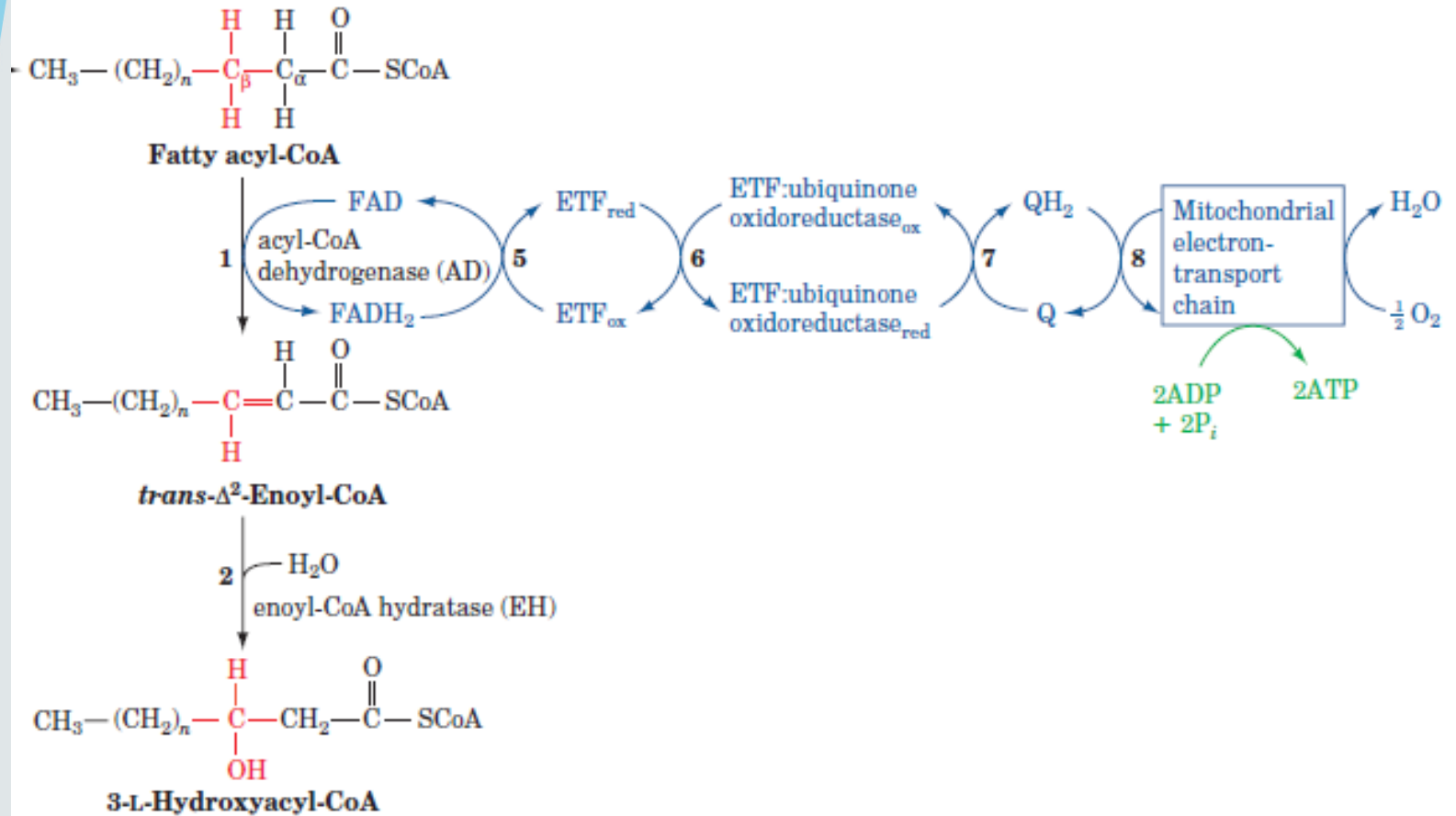
Fig. 7.6. Glyoxylate cycle.



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# β-Oxidation of Fatty Acids

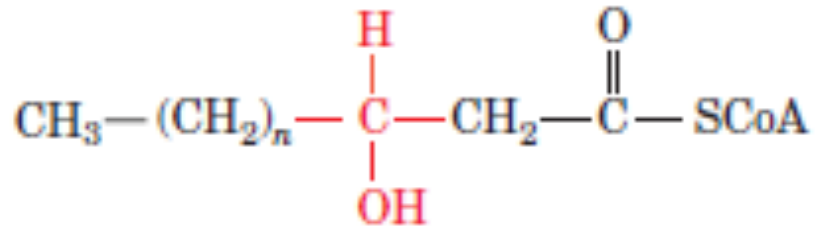




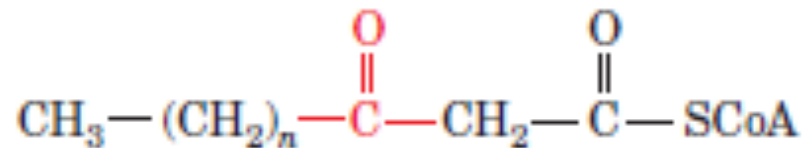
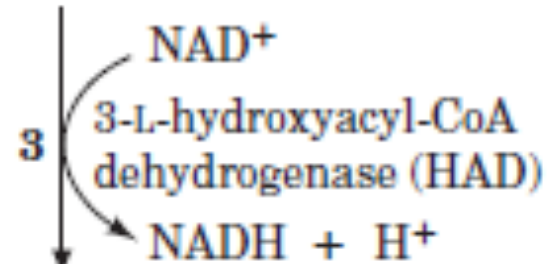
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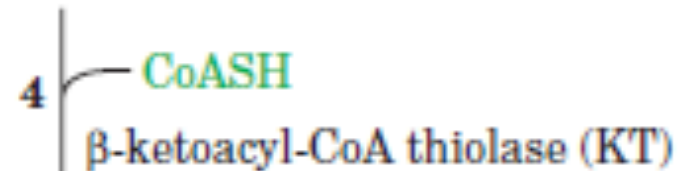
# $\beta$ -Oxidation of Fatty Acids



**3-L-Hydroxyacyl-CoA**



**$\beta$ -Ketoacyl-CoA**



**Fatty acyl-CoA**  
(2 C atoms shorter)

**Acetyl-CoA**

**...Stage 3**

$\beta$ -oxidation  
proper in  
Mitochondrial  
Matrix