

Topic 15. Digestion of lipids. Catabolism of triacylglycerols, its regulation. Oxidation of fatty acids and glycerol.

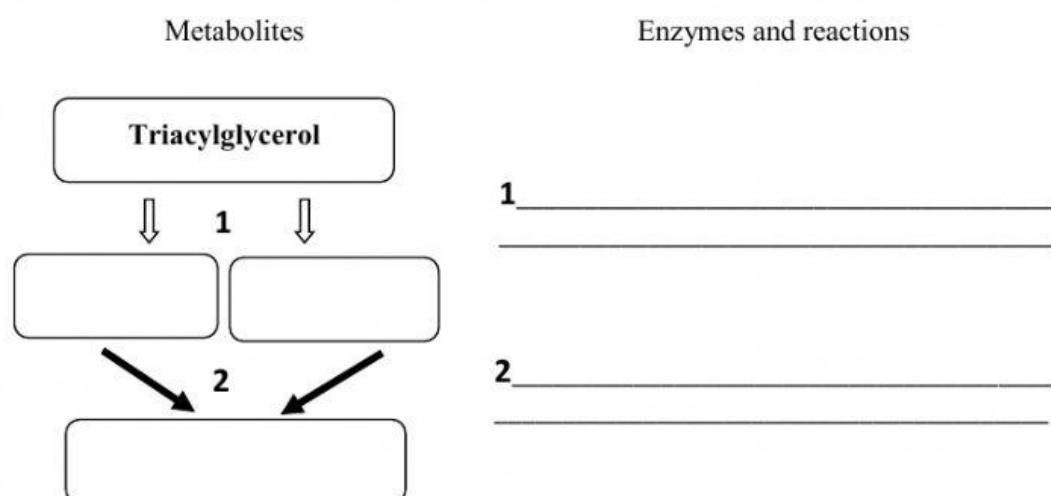
Theoretical questions:

1. Catabolism of Triacylglycerols in Digestive Tract: reactions.
2. Catabolism of Triacylglycerols in Adipose Tissue: reactions, regulation of TAG Lipase activity.
3. Glycerol catabolism. Energy balance of aerobic oxidation of Glycerol in muscle tissue.
4. Fatty Acids Oxidation:
 - 4.1. Fatty Acids activation.
 - 4.2. Transfer of Fatty Acids across the inner mitochondrial membrane, regulation of the process.
 - 4.3. Reactions and enzymes of β -oxidation.
 - 4.4. Energy balance of aerobic oxidation of Fatty Acids.

Study Questions and Tasks

1. Catabolism of Triacylglycerols:

1.1. Scheme in Digestive Tract:



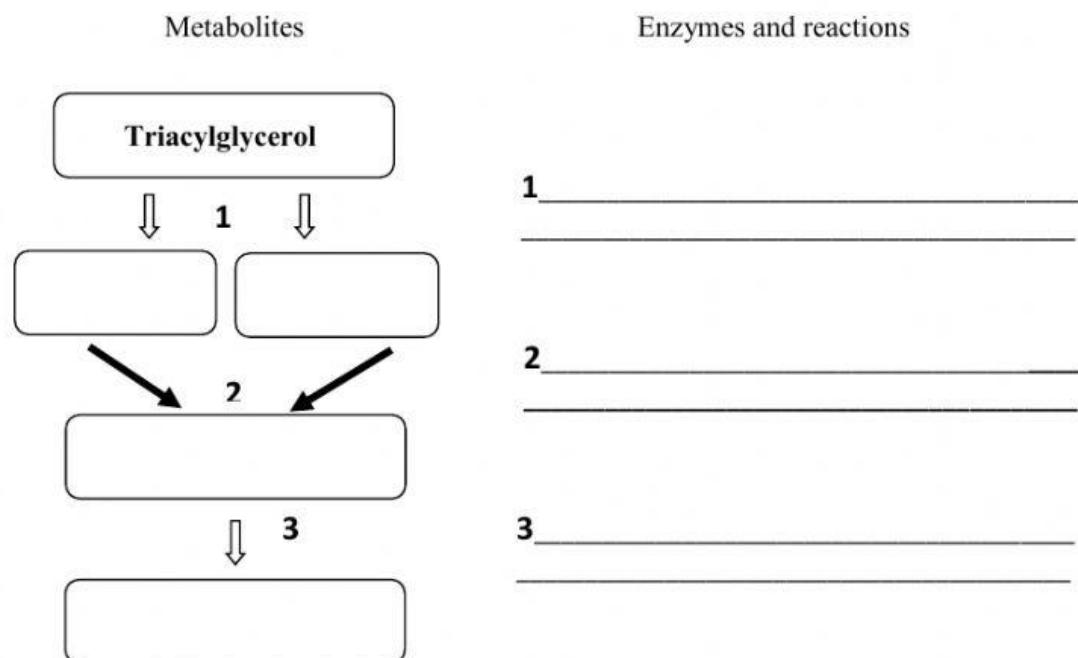
1.2. Reactions in Digestive Tract:

1.

2.

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1.3. Scheme in Adipose Tissue:



1.4. Reactions in Adipose Tissue:

1.

2.

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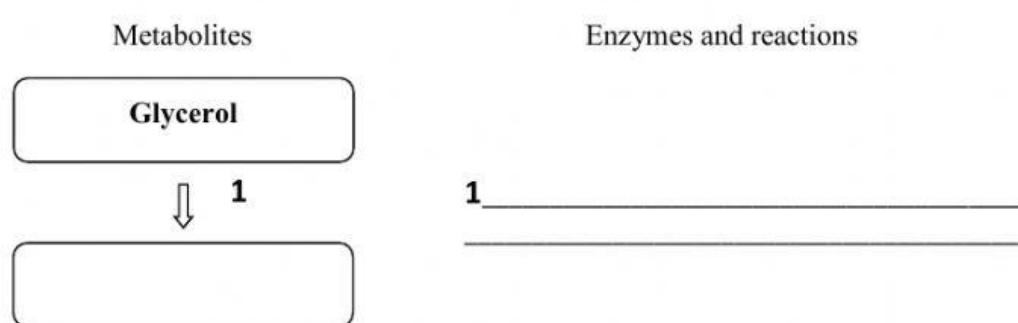
4.

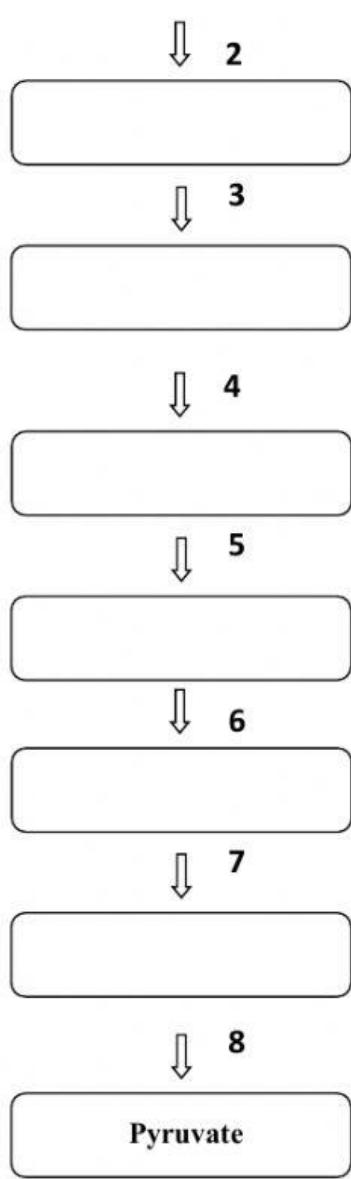
1.5. Write down the regulatory enzymes of TAG Lipase activity



2. Glycerol catabolism.

2.1. Scheme of glycerol oxidation till pyruvate





2 _____

3 _____

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6 _____

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8 _____

2.2. Write down the reactions of glycerol catabolism till GAP

1.

2.

3.

2.3. Energy balance of aerobic oxidation of Glycerol in muscle tissue.

	Glycerol till GAP	GAP till pyruvate	Krebs cycle + ETC
Number of ATP from			
Total number of ATP			

3. Fatty Acids Oxidation:

3.1. Transfer of Fatty Acids across the inner mitochondrial membrane. Draw a scheme.

3.2. Scheme of β -oxidation:

Metabolites

Enzymes and reactions



↓ 1

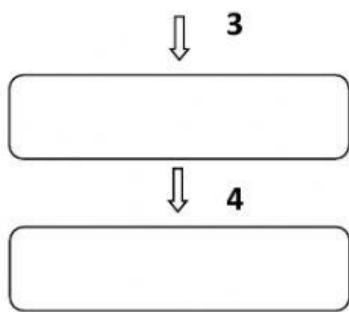
1 _____



↓ 2

2 _____





3 _____

4 _____

3.3. Reactions and enzymes of β -oxidation:

1.

2.

3.

4.

3.4.Energy balance of aerobic oxidation of palmitate

	Number of Acetyl-CoA	Number of $\text{NADH}^+ + \text{H}^+$	Number of FADH_2
Number of ATP from			
Total number of ATP			

Text-books:

1. Biochemistry 5th Edition Ch.16, pp.189-195.
2. Prasad textbook of biochemistry OCR. Topic 11, pp. 212-217.