

## Topic 16. Lipid Anabolism. Fatty Acids and Triacylglycerol Synthesis. Regulation of these processes.

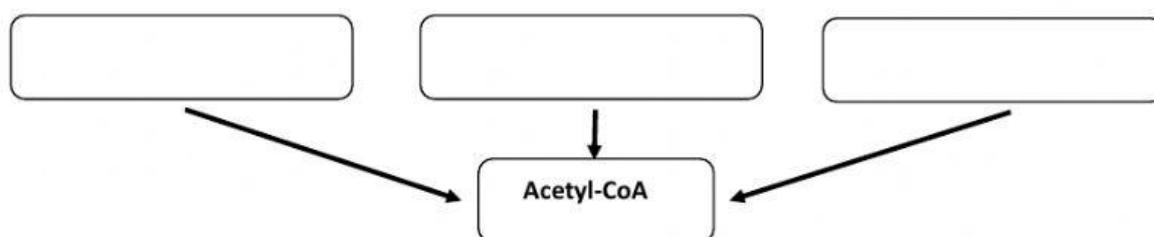
### *Theoretical questions:*

1. Fatty Acids Synthesis, its role in metabolism.
  - 1.1. Metabolic sources of Acetyl- CoA, its transport across the mitochondrial membrane into the cytoplasm.
  - 1.2. Reactions of Malonyl-CoA formation, the role of Acetyl-CoA Carboxylase, regulation of the process.
  - 1.3. Reactions of Fatty Acid Synthesis. The role of Fatty Acid Synthase, the role and sources of NADPH<sub>2</sub>.
2. Synthesis of Triacylglycerols, metabolic ways of Glycerol-3-Phosphate formation. Reactions of triacylglycerol synthesis from glycerol-3-phosphate.

### Study Questions and Tasks

#### 1. Fatty Acids Synthesis.

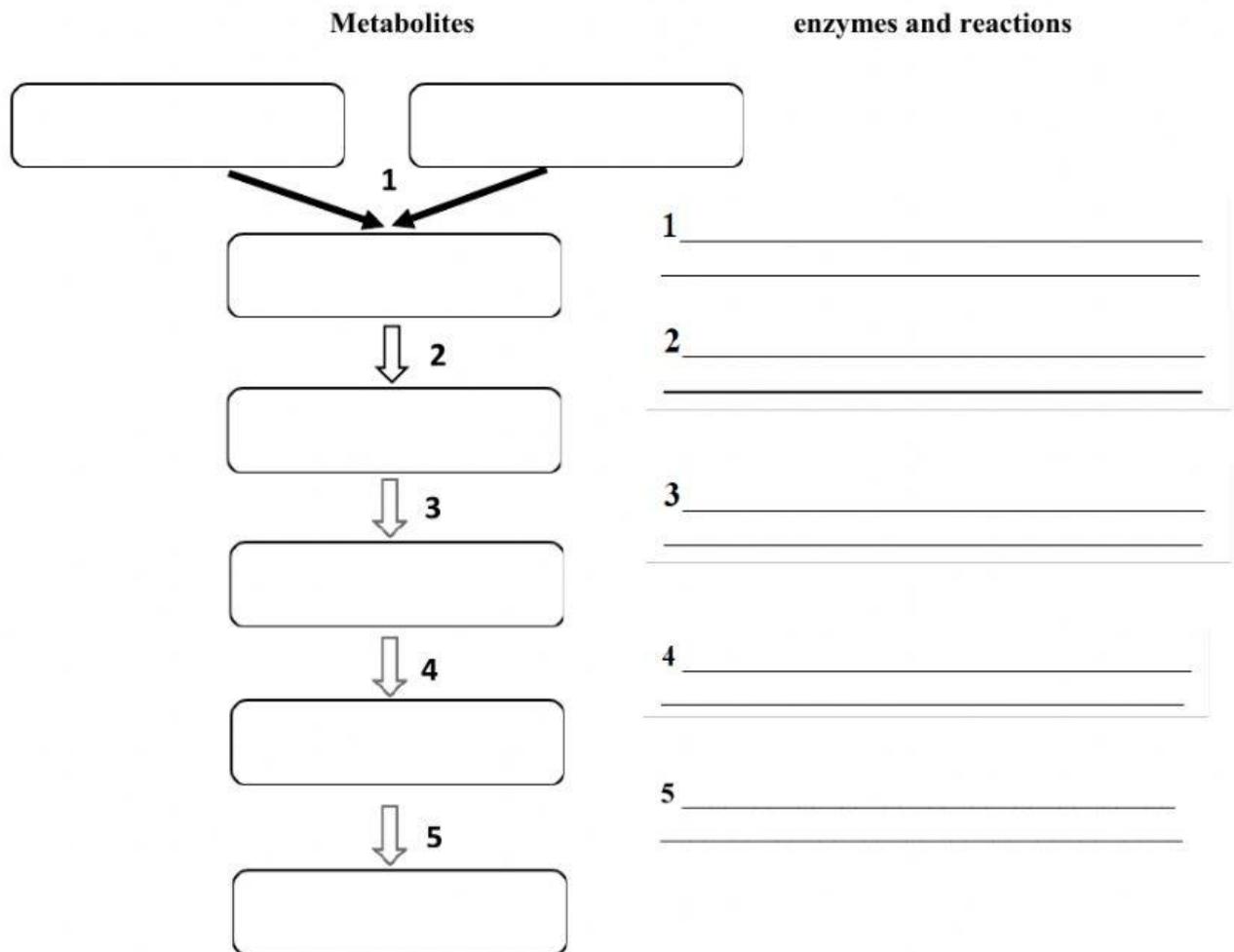
##### 1.1. Metabolic sources of Acetyl- CoA



##### 1.2. Acetyl-CoA transport across the mitochondrial membrane into the cytoplasm. Draw a scheme:

##### 1.3. Reaction of Malonyl-CoA formation:

1.4.Reactions of Fatty Acid Synthesis inside of fatty acid synthase (FAS) till butyryl-FAS:



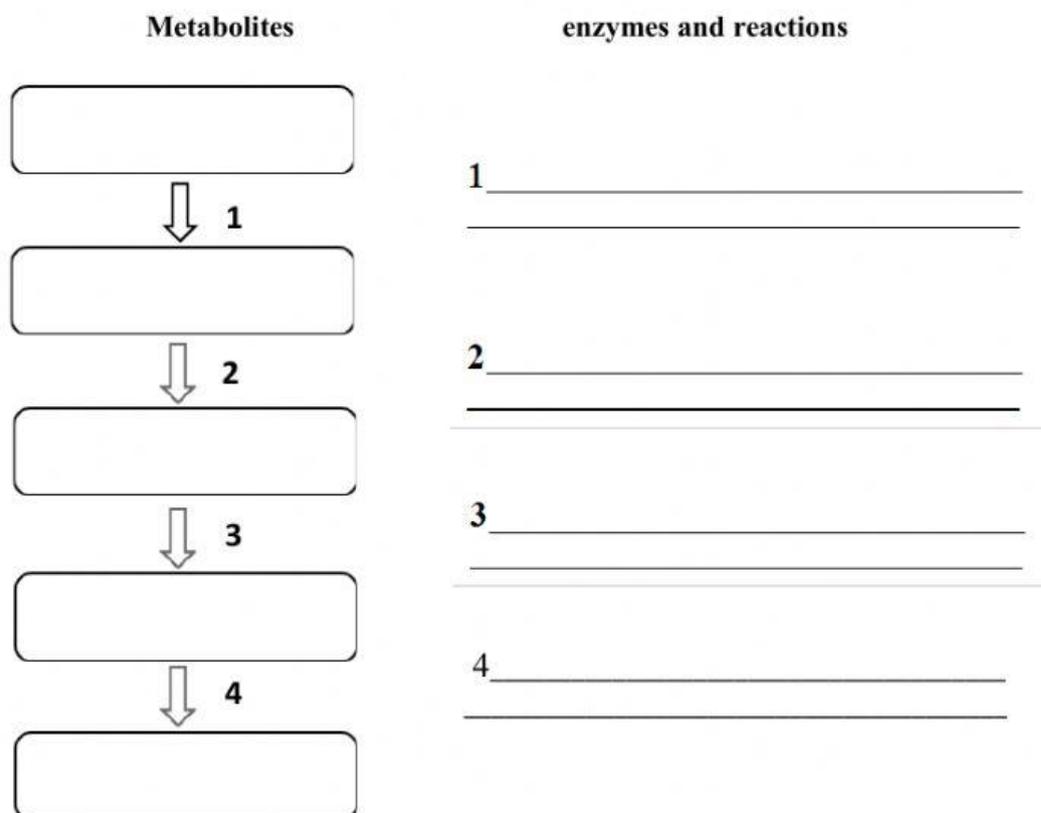
2. Synthesis of Triacylglycerols

2.1.Metabolic ways of Glycerol-3-Phosphate formation:

A. In the liver:

B. In the fatty tissue:

## 2.2.Synthesis of Triacylglycerols from Glycerol-3-Phosphate:



**Sites for additional information:**

<https://www.wiley.com/college/boyer/0470003790/animations/animations.htm>

[https://www.wpunj.edu/sec/vsec/science\\_courses/biochem/](https://www.wpunj.edu/sec/vsec/science_courses/biochem/)

**Text-books:**

1. Biochemistry 5th Edition Ch.23, pp.307-320.

2. Prasad textbook of biochemistry OCR. Topic 27. pp. 503-514.