

Topic 10. Glucose metabolism. Digestion of carbohydrates. Glycolysis. Aerobic and anaerobic oxidation of glucose.

Theoretical questions:

1. Digestion of carbohydrates.
2. Glycolysis.
 - 2.1. Localization and role of Glycolysis.
 - 2.2. Reactions, enzymes.
 - 2.3. Reactions connected to synthesis of ATP.
 - 2.4. Next steps of pyruvate catabolism, connection with common steps of catabolism.
 - 2.5. Glycolytic oxydoreduction during anaerobic oxidation of glucose. Role of LDH.
3. The Malate Aspartate and Glycerol Phosphate Shuttles, their role.
4. The energy balance of complete aerobic cleavage of glucose to CO₂ and water.
5. The role of aerobic glucose breakdown for the brain.

Study Questions and Tasks

1. Digestion of carbohydrates

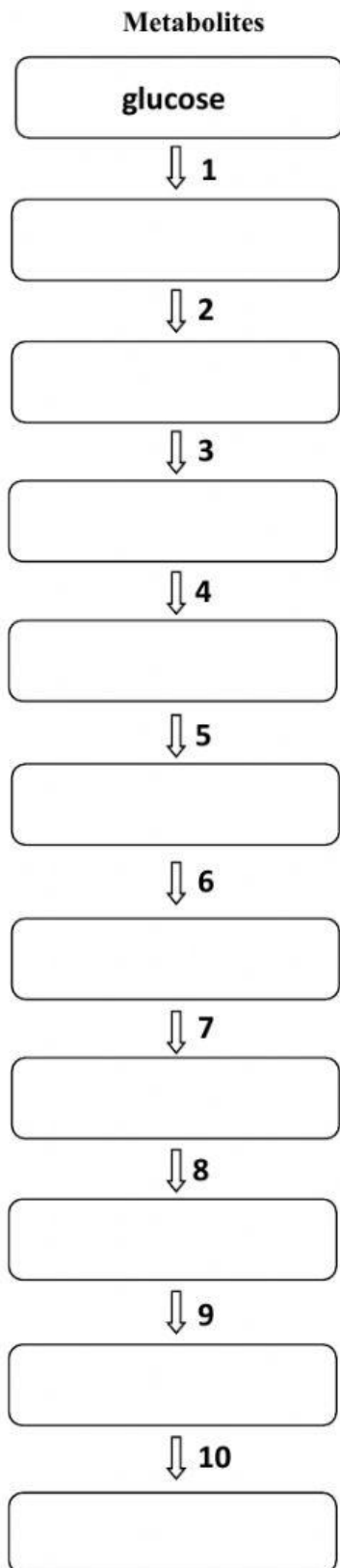
	Digestive Tract	Substrates	Enzymes	Products
1	In the Mouth			
2	In the Stomach			
3	In the Small Intestine			
4	In the Large Intestine			

2. Glycolysis

2.1. Definition _____

2.2. Biochemical role and localization:

2.3. Scheme



Enzymes and reactions

- 1 _____

- 2 _____

- 3 _____

- 4 _____

- 5 _____

- 6 _____

- 7 _____

- 8 _____

- 9 _____

- 10 _____

2.4. Write down the reactions of anaerobic glycolysis.

1. Reaction of phosphorylation

2.

3.

4.

5.

6.

7.

8.

9.

10.

11.

2.5. The energy balance of anaerobic and complete aerobic cleavage of glucose to CO₂ and water.

	Anaerobic glycolysis	Aerobic glycolysis
Number of ATP		

3. Regulation of glycolysis. Regulatory enzymes of glycolysis, their effectors.

Sites for additional information:

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

https://www.wpunj.edu/sec/vsec/science_courses/biochem/

Text-books:

1. Biochemistry 5th Edition Ch.7, pp.86-88, Ch.8, pp.91-108.

2. Prasad textbook of biochemistry OCR. Topic 9, pp. 156-161, Topic 10, pp. 172-179.