

## Topic 12. Pentose phosphate pathway. Glycogen catabolism and synthesis, their regulation.

### Theoretical questions:

1. The Pentose Phosphate Pathway (PPP), its localization in the cell.
2. Reactions and enzymes of the oxidative step, HADPH<sub>2</sub> formation.
3. Summary of the non-oxidative step of PPP. The links with Glycolysis and Gluconeogenesis.
4. Structure of Glycogen.
  - 4.1. Glycogen breakdown, reactions and enzymes. Regulation of glycogen breakdown.
  - 4.2. Glycogen synthesis, reactions and enzymes. Regulation of glycogen synthesis.
5. Reciprocal regulation of Glycogen metabolism.
6. Metabolism of Glycogen in different tissues: skeletal muscles and liver.

### Study Questions and Tasks

#### 1. The Pentose Phosphate Pathway (PPP)

##### 1.1. Definition

---

---

---

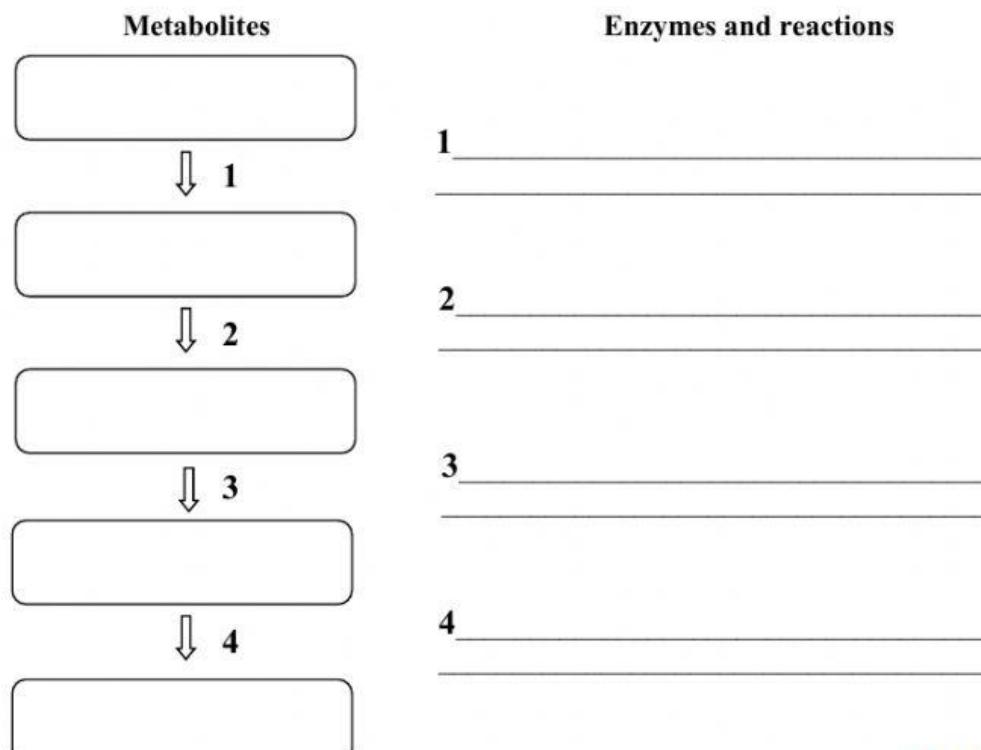
##### 1.2. Biochemical role and localization:

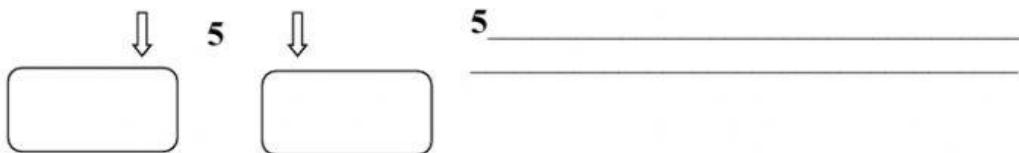
---

---

---

##### 1.3. Scheme





1.4. Write down the reactions of the oxidative step of PPP starting from glucose

1.

2.

3.

4.

5.

**2. Structure of Glycogen.**

- 2.1. Glycogen consists of \_\_\_\_\_
- 2.2. The main bond in glycogen is \_\_\_\_\_
- 2.3. In the branch point there is a bond \_\_\_\_\_
- 2.4. The name of protein inside of glycogen is \_\_\_\_\_

### 3. Metabolism of Glycogen.

3.1. Write down the reactions of Glycogen synthesis:

1.

2.

3.

4.

3.2. Write down the reactions of Glycogen catabolism:

1.

2.

3.

3.3. Regulation of glycogen metabolism.

SYNTHESIS	CATABOLISM
<b>Regulatory enzyme</b>	
<b>Molecular mechanism of regulation</b>	
<b>Inhibition or activation?</b>	

**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.11, pp.125-136, Ch.23, pp.307-320.

2. Prasad textbook of biochemistry OCR. Topic 10. pp. 172-211.