

Time  
to  
Quiz

ARE YOU READY?



# HEMATOPOIETIC & LYMPHATIC SYSTEM

## Erythrocytes metabolism quiz by Anas zakarneh

A 7-year-old girl has signs of anemia. Laboratory examination revealed pyruvate kinase deficiency in erythrocytes. What process disturbance plays the main role in anemia development?

- A. Peroxide decomposition
- B. Oxidative phosphorylation
- C. Tissue respiration
- D. Anaerobic glycolysis
- E. Amino acids desamination

Under anaerobic conditions during glycolysis ATP is synthesized by the way of substrate phosphorylation. This process uses energy of other highenergy compounds. Specify one of such compounds:

- A. Phosphoenol pyruvate
- B. Glucose 6-phosphate
- C. Lactate
- D. Pyruvate
- E. Glucose

Red blood cells for proper function need energy in form of ATP. What process provides the red blood cell with required amount of ATP?

- A. Anaerobic glycolysis
- B. Aerobic oxidation of glucose
- C. Tricarboxylic acid cycle
- D.  $\beta$ -oxidation of fatty acids
- E. Pentosophosphate pathway

Ans:  
D  
A  
A

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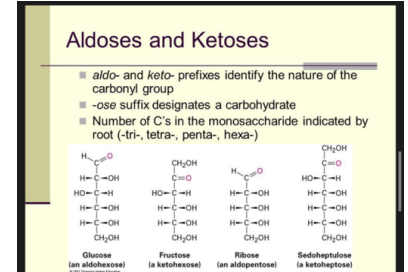


# HEMATOPOIETIC & LYMPHATIC SYSTEM

(مش هين) Which of the following statements about the glycolytic intermediate, fructose-6-phosphate is correct?

- A. In glycolysis fructose-6-phosphate is an aldol but is not itself split by the aldol reaction until phosphorylated to fructose-1:6-bisphosphate
- B. In glycolysis fructose-6-phosphate is converted to glucose-6-phosphate and can then be split by the aldol reaction into an aldehyde and a ketone
- C. In glycolysis fructose-6-phosphate is an aldol so once phosphorylated to fructose-1:6-bisphosphate cannot be split by the aldol reaction into an aldehyde and a ketone
- D. In glycolysis fructose-6-phosphate is formed from glucose-6-phosphate and is split by the aldol reaction into an aldehyde and a ketone

Hint 🤔



Most of the reactions of glycolysis are reversible. However, the three steps are irreversible. Specify these enzymes:

- A. Hexokinase, phosphofructokinase and pyruvate kinase
- B. Pyruvate kinase, phosphoglycerate kinase, phosphoglycerate mutase
- C. Phosphofructokinase, phosphohexose isomerase, enolase
- D. Glucokinase, enolase, phosphoglycerate mutase
- E. Phosphohexose isomerase, phosphoglycerate mutase, hexokinase,

A 24-year-old man presented with symptoms of shortness of breath, weakness and fatigue. His hemoglobin level was 7g/dl. Red blood cell isolated from the patient showed abnormally low-level of lactate. A deficiency of which of the following enzymes would be the most likely cause for patient's anemia?

- A. Pyruvate kinase
- B. Glucokinase
- C. Hexokinase
- D. Phosphofructokinase
- E. Phosphoglucose isomerase

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Ans:  
C  
A  
A



## HEMATOPOIETIC & LYMPHATIC SYSTEM

Which of the following step is common in the glycolysis and pentose phosphate pathway?

- a) Conversion of glucose to glucose-6-P
- b) Conversion of glucose-6-P to ribose-5-P
- c) Conversion of glucose-6-P- to fructose-6-P
- d) Conversion of glucose to glucose-1-P

Pentose phosphate pathway is responsible for generating NADPH (reducing equivalents in the cell) in the cell.

Which of the following enzyme is involved in generating NADPH?

- a) Glucose-6-P oxidase
- b) Glucose-6-P dehydrogenase
- c) Glucose-6-P reductase
- d) Glucose-6-P synthetase

The Pentose Phosphate Pathway enables cells to produce the following co-factor:

- \* A)NADH
- \* B)NADPH
- \* C)NADP+
- \* D)NAD+

Ans  
A  
B  
B

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# HEMATOPOIETIC & LYMPHATIC SYSTEM

The metabolic function of the pentose phosphate pathway is to:

- \* A) give the cell an alternative energy pathway should glycolysis fail.
- \* B) generate NADPH and pentoses for reduction and biosynthesis reactions.
- \* C) provide intermediates for the citric acid cycle.
- \* D) feed intermediates into glycolysis.

The products of the OXIDATIVE BRANCH of the pentose phosphate pathway that comes with synthesis of carbon dioxide :

- \* A) NADH and Ribulose 5-phosphate
- \* B) NADH and Ribose 5-phosphate
- \* C) NADPH and Ribulose 5-phosphate
- \* D) NADPH and Ribose 5-phosphate

If a liver cell converts glucose to ribulose 5 phosphate, and then converts that ribulose 5 phosphate to fructose 6 phosphate and glyceraldehyde 3 phosphate for use in glycolysis, which of the following statements must be true?

- \* A) The cell has an equal need for NADPH and ribose
- \* B) The cell needs NADPH but doesn't need ribose or ATP
- \* C) The cell needs ribose and ATP but not NADPH.
- \* D) The cell needs NADPH and ATP.

Ans  
B  
C  
D

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## VIP questions

Choose the most accurate answer :

- A) Cyt B5 reductase is a flavoprotein that's mean That has an NAD enter in his structure
- B) 2,3-BPG has a high positively charge so can bind to the pocket easily
- C) T form of HB found abundant in lung
- D) if patient has a hypoxia that's mean we could find a high concentration of 2,3 BPG
- E) all of the above are correct

Sulfanilamides are applied as antimicrobial agents in clinical practice. Sulfanilamide treatment, however, can result in hemolytic anemia development in patients that suffer from genetic defect of the following enzyme of pentose phosphate metabolism in erythrocytes:

- A. Glucose-6-phosphate dehydrogenase
- B. Hexokinase
- C. Transketolase
- D. Transaldolase
- E. Pyruvate kinase

Ans  
D  
A

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