

<Q> Concentration of all of the following molecules directly regulates the activity of glycogen synthase, except:

<S>Y

<C+>Glucose

<C>Glucose-6-phosphate

<C>AMP

<C>ATP

<Q> When glycogen synthase is phosphorylated

<S>Y

<C+>its activity decreases.

<C>its activity increases.

<C>its activity is unaffected.

<C>That enzyme doesn't get phosphorylated.

<Q> Biotin is important in gluconeogenesis for all of these reasons, except:

<S>Y

<C>It is necessary to add CO₂ to certain intermediates in this pathway.

<C+>CO₂ becomes one or more of the 6 carbons in the glucose product.

<C>Biotin is capable of binding covalently to CO₂.

<C>Biotin helps synthesize an important precursor of phosphoenolpyruvate.

<Q> Gluconeogenesis is the synthesis of:

<S>Y

<C+>glucose from non-carbohydrate precursors

<C>glycogen from glucose

<C>pyruvate from glucose

<C>fatty acids from glucose

<Q> Gluconeogenesis differs from glycolysis because

<S>N

<C>the irreversible steps of glycolysis are bypassed

<C>different enzymes are involved

<C>biotin is required for gluconeogenesis and not for glycolysis

<C+>all of the above

<Q> In the Cori cycle

<S>Y

<C>lactic acid is transported from the liver to muscle by the blood

<C>lactic acid is transported from the liver to the kidneys by the blood

<C+>glycolysis takes place in muscle and gluconeogenesis in the liver

<C>glycolysis takes place in the liver and gluconeogenesis in muscle

<Q> The oxidative reactions of the pentose phosphate pathway

<S>Y

<C+>produce NADPH rather than NADH

<C>require biotin

<C>require coenzyme A

<C>require thiamine pyrophosphate

<Q>Which of the following is INCORRECT about gluconeogenesis?

<S>Y

<C>It occurs only in liver tissue

<C>It refers to the synthesis of glucose from small non-carbohydrate precursors

<C+>It is stimulated by high concentration of fructose-2,6-bisphosphate

<C>It occurs in three cellular locations (cytosol, mitochondria, and ER)

<Q>Transketolase resembles which of the following enzymes in its requirement of both magnesium ion and TPP for its activity?

<S>Y

<C>Pyruvate kinase.

<C>Pyruvate dehydrogenase.

<C+>Pyruvate decarboxylase.

<C>Pyruvate carboxylase

<Q>Which of the following is both an allosteric inhibitor of glycogen phosphorylase and activator of glycogen synthase?

<S>Y

<C>ATP.

<C+>Glucose-6-phosphate.

<C>AMP.

<C>Glucose.

<Q>The second intermediate formed from glucose in the pentose phosphate pathway is:

<S>Y

<C>6-phosphogluconolactone.

<C>xylulose-5-phosphate.

<C>fructose 6-phosphate.

<C+>ribulose 5-phosphate.

<Q>Which of the following statements regarding formation of glucose-1-phosphate from glycogen is NOT CORRECT?

<S>Y

<C>It triggered by low blood glucose

<C+>It requires ATP hydrolysis

<C>It is catalyzed by glycogen phosphorylase enzyme

<C>It involves cleavage of an alpha(1-->4) bond

<Q>In the glycogen synthesis pathway

<S>Y

<C>glucose-6-phosphate first interacts with UTP to give UDP-glucose

<C>glucose is first interacts with UTP to give UDP-glucose

<C+>glucose-1-phosphate first interacts with UTP to give UDP-glucose

<C>glucose is first interacts with UDP to give UDP-glucose

<Q>Conversion of pyruvate into phosphoenolpyruvate requires the hydrolysis of

<S>Y

<C>one ATP

<C>two ATP

<C+>one ATP and one GTP

<C>two GTP

<Q>Which of the following statements is not correct regarding pentose phosphate pathway?

<S>Y

<C>An alternative pathway to glycolysis

<C>produces NADPH

<C>produces pentose sugars

<C+>generates 2ATP molecules per glucose molecule

<Q>Which of the following enzymes is found in the mitochondria?

<S>Y

<C>Hexokinase.

<C>Pyruvate kinase.

<C>Glucose-6-phosphatase.

<C+>Pyruvate carboxylase.

<Q>Increased production of lactate in muscle cells: #

<S>Y

<C>stimulates gluconeogenesis in muscle cells

<C+>stimulates gluconeogenesis in liver

<C>stimulates glycolysis in muscle cells

<C>stimulates glycolysis in liver

<Q>The aim of the pentose phosphate pathway is to produce:

<S>Y

<C>Ribulose-5-phosphate plus NADPH plus CO₂.

<C+>Ribose-5-phosphate plus NADPH.

<C>Xylulose-5-phosphate plus NADPH plus CO₂.

<C>Fructose-6-phosphate plus ribose-5-phosphate plus glyceraldehydes-3-phosphate.

<Q>The Cori cycle operates between liver and:

<S>Y

<C>Heart.

<C>Kidney.

<C+>Muscle.

<C>Brain.

<Q>Which of the following regarding regulation of glycogen phosphorylase in muscles is NOT CORRECT?

<S>Y

<C+>phosphorylation inactivates the enzyme

<C>High ATP concentrations inhibits the enzyme

<C>High glucose-6-phosphate concentrations inhibits the enzyme

<C>High AMP concentrations activates the enzyme

<Q>The reaction that converts pyruvate into oxaloacetate occurs in:

<S>Y

<C+>Mitochondrial matrix

<C>Mitochondrial intermembrane space

<C>Cytosol

<C>Endoplasmic reticulum

<Q>During exercise, muscle cells have

<S>Y

<C>high ATP/ADP ratio

<C>high NADH/NAD ratio

<C>Low pyruvate concentrations

<C+>Low NADH/NAD ratio

<Q>Which of the following statements is CORRECT?

<S>Y

<C+>Increased concentration of fructose-2,6-bisphosphate stimulates glycolysis

<C>Increased concentration of fructose-2,6-bisphosphate stimulates gluconeogenesis

<C>Increased activity of fructose-2,6-bisphosphatase stimulates glycolysis

<C>Increased activity of fructose-2,6-bisphosphatase inhibits gluconeogenesis

<Q>Oxaloacetate conversion into phosphoenolpyruvate occurs in

<S>Y

<C>Krebs cycle

<C+>gluconeogenesis

<C>glycolysis

<C>urea cycle

<Q>One of the principal sources of NADPH is

<S>Y

<C+>the pentose phosphate pathway

<C>gluconeogenesis

<C>oxidative phosphorylation

<C>the citric acid cycle

<Q>Glycogen is mainly found in

<S>Y

<C+>liver and muscle

<C>liver and brain

<C>muscle and brain

<C>liver, muscle, and brain

<Q>The enzyme glycogen phosphorylase catalyzes a reaction in

<S>Y

<C>the formation of glycogen from glucose

<C+>glycogen breakdown

<C>gluconeogenesis

<C>the pentose phosphate pathway

<Q>How many ATP and GTP molecules are required for the synthesis of one molecule of glucose via gluconeogenesis?

<S>Y #

<C+>4GTP+2ATP

<C>2GTP+2ATP

<C>4ATP+4GTP

<C>2GTP+4ATP

<Q>One of the principal sources of NADPH in erythrocytes is

<S>Y

<C>the conversion of Glucose-6-P into lactate

<C+>the conversion of Glucose-6-P into pentose-5-phosphate

<C>oxidative phosphorylation

<C>the citric acid cycle

<Q>The reaction: Fructose-1,6-bisphosphate -->fructose-6-P is catalyzed by the enzyme

<S>Y

<C>phosphofruktokinase

<C+>fructose-1,6-bisphosphatase

<C>triose phosphate isomerase

<C>fructose-6-phosphatase

<Q>Transketolase catalyses the transfer of a:

<S>Y

<C> 2C group to a ketose

<C+>2C group to an aldose

<C> 3C group to an aldose

<C> 3C group to a ketose

<Q> Which of the following is not an intermediate in, or a product of, the pentose phosphate pathway?

<S>Y

<C> Ribulose-5-phosphate.

<C> Carbon dioxide.

<C+>NADH.

<C> Fructose-6-phosphate.

<Q> The _____ is the site of most gluconeogenesis in mammals.

<S>Y

<C+>liver

<C>pancreas

<C>cytosol of all cells

<C>small intestine

<Q> An intermediate found in gluconeogenesis and not glycolysis is

<S>Y

<C>2-phosphoglycerate.

<C+>oxaloacetate.

<C>phosphoenolpyruvate.

<C>fructose 1,6-bisphosphate.

<Q> The reaction that converts amino acids into keto acids (such as pyruvate) is called

<S>Y

<C>the Cori cycle.

<C>catabolism.

<C+>transamination.

<C>dehydrogenation.

<Q> Glycogen synthesis in vertebrates requires _____ to activate glucose 1-phosphate.

<S>Y

<C>ATP

<C>ADP

<C+>UTP

<C>UDP