CH 22 OWL (1-10)

The substrate for glycogen synthase is:

|  |  |  |
| --- | --- | --- |
| http://owl.cengage.com/owlimages/check.GIF |  | UDP-glucose |
|  |  | α-D-glucose-1-phosphate |
|  |  | UDP-glucose-1-phosphate |
|  |  | α-D-glucose-6-phosphate |

Cortisol affects glycogen metabolism by  
a. increasing the activity of glycogen synthase and reducing gluconeogenesis.  
b. stimulating gluconeogenesis and increasing glycogen synthesis.  
c. increasing expression of several genes encoding enzymes of the gluconeogenic pathway.  
d. stimulating the urea cycle.

|  |  |  |
| --- | --- | --- |
|  |  | a & c |
|  |  | b & c |
| http://owl.cengage.com/owlimages/check.GIF |  | b, c, & d |
|  |  | None of the Above |

Pyruvate kinase catalyzes one of three exergonic reactions of glycolysis. This reaction is reversed in gluconeogenesis by:

|  |  |  |
| --- | --- | --- |
| http://owl.cengage.com/owlimages/check.GIF |  | pyruvate carboxylase and PEP carboxykinase |
|  |  | glucose-6-phosphatase and fructose-1,6-bisphosphatase |
|  |  | pyruvate decarboxylase and PEP carboxylase |
|  |  | phosphoglycerate kinase and phosphoglycerate phosphatase |
|  |  |  |

The Cori Cycle involves  
a. metabolic interaction between liver and muscle.  
b. the production of lactate by muscle tissue under anaerobic conditions being converted to glucose in the liver.  
c. the liver exporting pyruvate to muscle, where it is converted into lactate to regenerate NAD+ for glycolysis.  
d. lactate dehydrogenase acting in the muscle to convert pyruvate to lactate, and in the liver to convert lactate to pyruvate.

|  |  |  |
| --- | --- | --- |
|  |  | a, b, & c |
|  |  | a & b |
| http://owl.cengage.com/owlimages/GreenRightArrow.GIF |  | a, b, & d |
|  |  | All of the Above |

Which of the following biochemical processes are regulated by xylulose-5-phosphate?

|  |  |  |
| --- | --- | --- |
|  |  | Increases the production of acetyl-CoA and fatty acids. |
|  |  | Increases the level of enzymes required for fatty acid synthesis. |
|  |  | Stimulates glycolysis and inhibits gluconeogenesis by increasing the levels of fructose-2,6-bisphosphate. |
| http://owl.cengage.com/owlimages/check.GIF |  | All of the Above |

During vigorous exercise lactate:

|  |  |  |
| --- | --- | --- |
|  |  | produced by the liver is used as a gluconeogenic substrate by muscle |
| http://owl.cengage.com/owlimages/check.GIF |  | produced by muscle is used as a gluconeogenic substrate by the liver |
|  |  | is converted to pyruvate by muscle |
|  |  | lactate is converted to glycogen by the liver |

Glycogen phosphorylase catalyzes:

|  |  |  |
| --- | --- | --- |
|  |  | formation of α-D-glucose-6-phosphate |
| http://owl.cengage.com/owlimages/check.GIF |  | phosphorolysis of α(1→4) glycosidic links in glycogen |
|  |  | hydrolysis of α(1→4) glycosidic links in glycogen |
|  |  | phosphorolysis of α(1→6) glycosidic links in glycogen |

The phosphorylase cascade  
a. is initiated by epinephrine or glucagon binding to receptors on the outer cell membrane.  
b. is initiated by insulin binding to receptors on the outer cell membrane.  
c. amplifies the hormonal signal because the binding of a few molecules of hormone leads to the synthesis of many more molecules of cAMP, which activates more molecules of phosphorylase kinase, which leads to many more molecules of phosphorylase.  
d. acts to decrease the glucose concentration in the blood by stimulating glycogen synthesis and inhibiting glycogen breakdown in liver and muscle.

|  |  |  |
| --- | --- | --- |
|  |  | b & d |
| http://owl.cengage.com/owlimages/check.GIF |  | a & c |
|  |  | b, c, & d |
|  |  | None of the Above |

The major precursors for gluconeogenesis in mammals are:

|  |  |  |
| --- | --- | --- |
| http://owl.cengage.com/owlimages/check.GIF |  | pyruvate, lactate, glycerol and most amino acids |
|  |  | pyruvate, lactate and acetyl-CoA |
|  |  | lysine, leucine, glycerol and fatty acids |
|  |  | amino acids and fatty acids |

The action of phosphoprotein phosphatase-1:

|  |  |  |
| --- | --- | --- |
|  |  | activates phosphorylase and glycogen synthase |
|  |  | inactivates phosphorylase and glycogen synthase |
| http://owl.cengage.com/owlimages/check.GIF |  | inactivates phosphorylase and activates glycogen synthase |
|  |  | activates phosphorylase and inactivates glycogen synthase |