

Exercise 1: Glycogen and gluconeogenesis

These are questions that appeared in a final exam at a nearby university for a similar course. Try them without the text first, then use the text to check your answers.

1. Epinephrine is released when you exercise. Both liver and muscle express adrenergic receptors. What is the effect of epinephrine in liver and muscle?
 - a. Stimulation of glycolysis in liver and muscle.
 - b. Stimulation of glycogen degradation in muscle but not in liver.
 - c. Inhibition of glycogen synthesis in muscle and liver.
 - d. Inhibition of gluconeogenesis in liver but not in muscle.
 - e. None of these is correct.

2. The Cori cycle describes a metabolic cycle between liver and muscle. Which of the following reactions is part of the Cori cycle?
 - a. Reduction of pyruvate in liver.
 - b. Conversion of pyruvate to acetyl-CoA in muscle.
 - c. Phosphorylation of fructose-6-phosphate (on C1) in liver.
 - d. Phosphorylation of glucose in liver.
 - e. None of these is correct.

3. Which one of the following processes depends on biotin?
 - a. Conversion of pyruvate to acetyl-CoA.
 - b. Conversion of pyruvate to glyceraldehyde-3-phosphate.
 - c. Incorporation of glucose into glycogen.
 - d. The transaldolase reaction.
 - e. None of these is correct.

4. Identify the protein that is expressed in liver *and* muscle.
 - a. Glucagon receptor
 - b. Glucokinase
 - c. GLUT4 glucose transporter
 - d. Glucose-6-phosphate dehydrogenase
 - e. None of these

5. For the question above, for the answers not chosen, identify which organ each protein is expressed.