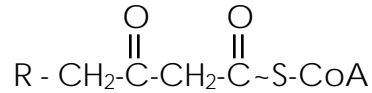


Chapter 19 Questions  
Fatty Acid Metabolism

- 1) Study exercises; 2, 3, 5, 6, 7 and 11. Chapter problems; 1, 2, 5, 6, 7 and 9.
- 2) Name the irreversible enzyme in fatty acid synthesis. What is the thermodynamics which drive this reaction?
- 3) Write each of the lipoproteins and indicate their main biochemical function. (hint where do they come from what do they carry where do they go)
- 4) Which is the good cholesterol? Is this statement misleading? Is it really all cholesterol?
- 5) T/F Dietary triacylglycerides (TAGs) are transported through the intestinal wall into the lymphatic system unchanged
- 6) Which of the following statements about the triacylglycerols stored in adipose tissue are correct?
  - a) They are hydrolyzed to form fatty acids and dihydroxyacetone
  - b) They are hydrolyzed by a lipase that is activated by covalent modification
  - c) They release fatty acids that can be oxidized to  $\text{CO}_2$  and  $\text{H}_2\text{O}$
  - d) They can yield a precursor of glucose
  - e) They are mobilized by epinephrine or glucagon
- 7) How is pyrophosphate involved in the activation of fatty acids for  $\beta$  oxidation?
- 8) In fat cells the initial liberation of fatty acid from triacylglycerol is due to
  - a) phospholipase A
  - b) triacylglycerolipase
  - c) hormone sensitive lipase
  - d) fatty acid-hydrolyase
  - e) I don't know I have only stored fatty acids never released them
- 9) The de novo biosynthesis of fatty acids takes place mainly in the
  - a) cytosol
  - b) mitochondria
  - c) extra cellular matrix
  - d) within the inner mitochondrial matrix
  - e) endoplasmic reticulum
- 10) Biotin is involved in which of the following:
  - a) Malonyl CoA production
  - b) AcetylCoA activation to Acyl-carnitine
  - c) Transport across the inner mitochondrial membrane

d) The first reduction step in  $\beta$  oxidation

11) Draw the next step in  $\beta$  oxidation assuming the following molecule is an intermediate.



12) What would the effect of a carnitine transferase deficiency in a person who is in a starvation state?

13) Why were researchers surprised to find that the production of fatty acids is dependent on bicarbonate, yet radioactive bicarbonate is not incorporated into the new fatty acid?

14) Why does the concentration of ketone bodies increase in uncontrolled diabetics and folks on a high protein low carbohydrate diet?

15) Explain the involvement of carnitine in the  $\beta$  oxidation of fatty acids.

16) Which of the following statements about acetoacetate and 3-hydroxybutarate are correct?

- a) They are normal fuels for heart muscle and brain tissue
- b) They are predominately synthesized in the liver
- c) They both can give rise to acetone
- d) They can be regarded as a water soluble transportation form of citrate in the blood

17) Which of the following statements answers the sentence correctly? The major product of the fatty acid synthase complex in mammals is\_\_\_\_\_

- a) oleate
- b) stearate
- c) stearoyl CoA
- d) linoleate
- e) palmitate
- f) palmitoyl CoA

18) Calculate the ATP and NADPH requirements for the synthesis of lauric acid (C12:0) from acetyl CoA and from pyruvate.