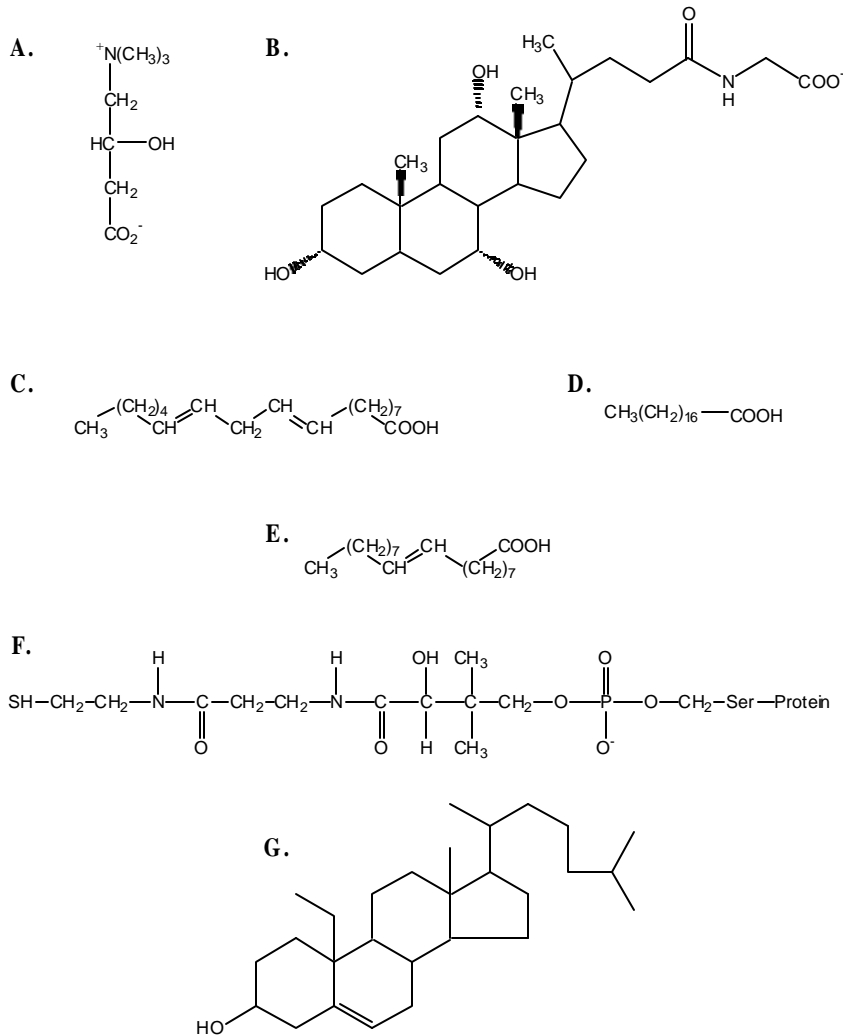


BIOSCI 1820  
 Quiz #5  
 MAR 2001

I. Choose the structure on the right that best matches the definition on the left.



\_\_\_ stearic acid

\_\_\_ oleic acid

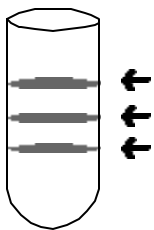
\_\_\_ carnitine

\_\_\_ acyl carrier protein

\_\_\_ bile salt

II. You subject a purified mixture of LDL, chylomicrons, and HDLs to centrifugation in order to separate them by density and obtain the following 3 bands in the centrifuge tube after spinning the sample.

Identify each of the three bands:



III. Explain how triacylglycerols move from the intestine to the lymph system and capillaries **soon after** the ingestion of fats (do **not** discuss the entire VLDL-IDL-LDL, etc. pathway...).

IV. Multiple Choice: Choose the best answer...

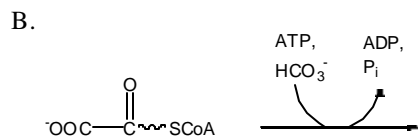
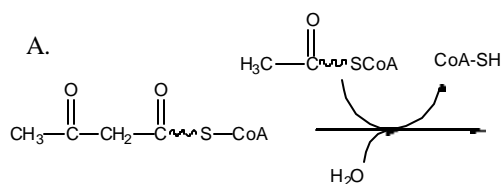
Which of the following is false with regard to the mechanism by which an LDL particle delivers its cholesterol into a target cell?

- A. ApoB-100 interacts with the LDL receptor
- B. The LDL-LDL receptor complex is endocytosed via "coated pits"
- C. The endocytic vesicles fuse with lysosomes, which have a high internal pH because of a proton pump in their membrane.
- D. Cholesterol and amino acids are freed into the cytoplasm
- E. The liberation of cholesterol down-regulates HMG-CoA reductase and the synthesis of new LDL receptors.
- F. All of the above are correct.

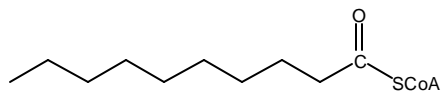
During exercise, epinephrine is released into the blood stream, with the ultimate goal being the generation of metabolites for energy production. Which of the following events is not evident in this pathway?

- A. Epinephrin binds to the G-Protein-coupled receptor
- B. The  $\beta$ -subunit of the G protein exchanges its pre-bound GDP for GTP
- C. Adenylate cyclase is activated, with a resulting increase in cAMP
- D. Protein kinase phosphorylates triacylglycerol lipase
- E. Fatty acids are freed from triacyl glycerol
- F. All of the above are correct.

V. Draw the structures of the products of the following reactions:



VI. The following compound is delivered to the  $\beta$ -oxidation pathway. Showing all of your work and assumptions, how many ATPs could be generated from the complete oxidation of this molecule in the mitochondria?



VII. Acetyl-CoA radio-labeled with carbon-14 at the indicated position is fed into the fatty acid synthase pathway. Draw the structure of a monoacylglycerol containing a 12 carbon fatty acid at the 2-position which was generated exclusively from the radiolabeled acetate (assume that the glycerol was pre-existing).

