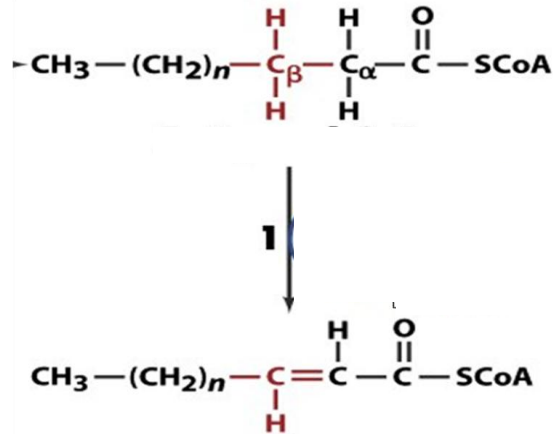
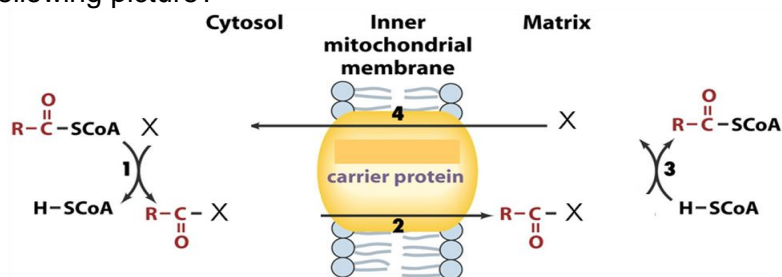


Sample questions for Exam 3

1. What is the following reaction?



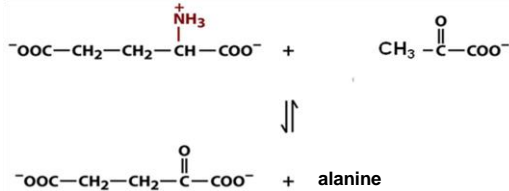
- a) dehydration
 - b) reduction
 - c) oxidation
 - d) esterification
 - e) thioesterification
2. NADPH is a participant in the _____ pathway
- a) Fatty acid catabolism
 - b) Fatty acid biosynthesis
 - c) gluconeogenesis
 - d) Electron transport
 - e) Krebs Cycle
3. What is X in the following picture?



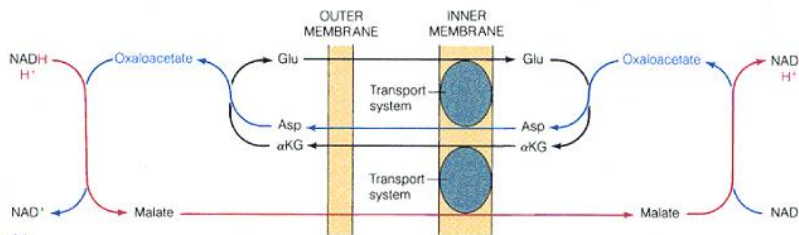
- a) Carnitine
- b) ACP (Acyl Carrier Protein)
- c) NAD+
- d) NADH
- e) malate

4. In the picture in the previous question, reactions 1 and 3 are the reverse of one another and thus if one has a negative ΔG_o the other must have a positive ΔG_o . Nevertheless, both are able to proceed in a cell, because
- the concentrations of CoA-SH are different on the two sides of the membrane
 - they are carried out by different enzymes
 - the activation energy (ΔG^*) for both is negative
 - the $K_{eq} = 0$ for both
 - Actually only one is able to proceed in a given cell

5. What cofactor participates in the following reaction?

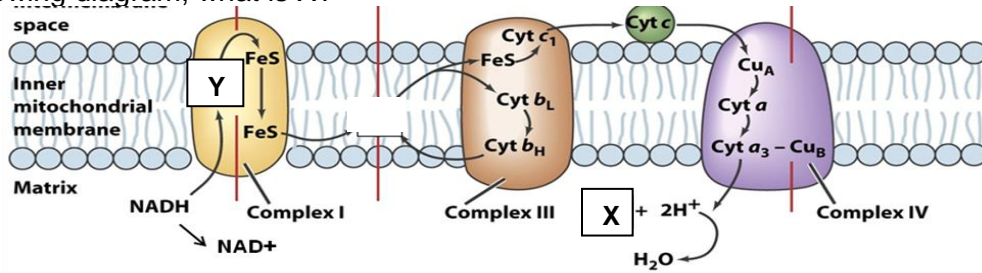


- pyridoxal phosphate
 - NAD⁺
 - FAD
 - thiamine pyrophosphate
 - lipoic acid
6. Coenzyme Q (ubiquinone) is a participant in the _____ pathway
- Fatty acid catabolism
 - Fatty acid biosynthesis
 - gluconeogenesis
 - Electron transport
 - Krebs Cycle
7. Fructose -2,6 bis phosphate is
- An intermediate of glycolysis only
 - An intermediate of gluconeogenesis only
 - An intermediate of both glycolysis and gluconeogenesis
 - A regulator of glycolysis and gluconeogenesis
 - A regulator of glucagon levels
8. The **function** of the process shown in the following picture is to transport _____ into the mitochondria.



- NAD⁺
- malate
- Glu
- Electrons
- Protons (H⁺)

9. In the following diagram, what is X?



- FAD
- FMN
- O₂
- Iron-sulfur protein
- Coenzyme Q

10. During the **catabolism** of a fatty acid by β -oxidation a molecule with a β -hydroxyl group is converted to

- a molecule with a β -keto group
- a molecule with a β -amino group
- a molecule with a β -carboxyl group
- an α - β unsaturated molecule
- None of the above

11. The best target for drugs to inhibit cellular DNA synthesis without inhibiting RNA synthesis would be the _____ reaction

- UTP \rightarrow CTP
- UDP \rightarrow UTP
- orotate \rightarrow OMP
- ribonucleotide reductase
- aspartate transcarbamoylase (ATCase)

12. The difference between a nucleoside and a nucleotide is that a nucleotide has a _____ whereas a nucleoside does not.

- deoxysugar
- ribosugar
- phosphate
- pyrimidine base
- purine base

13. In humans, catabolism of amino acids results in 2 major products which are excreted from the body, CO₂ and

- urea
- carbamoyl phosphate
- Carnitine
- Ammonia
- glutamic acid

14. Exposure of cells to the hormone Glucagon results in a decrease in

- gluconeogenesis
- glycogen synthesis
- glycogen phosphorolysis
- fatty acid biosynthesis
- urea biosynthesis

15. The participant in electron transport which has the most positive reduction potential (E°) is
- NADH
 - O_2
 - FeS
 - coQ
 - cytC
16. A reaction of gluconeogenesis which is catalyzed by the same enzyme as a reaction of glycolysis is one in which
- pyruvate is converted to phosphoenolpyruvate
 - fructose-6-phosphate is converted to glucose-6-phosphate
 - glucose-6-phosphate is converted to glucose
 - fructose-1,6-bisphosphate is converted to fructose-6-phosphate
 - all of the above
17. A product of the glycogen phosphorylase reaction is
- glucose
 - glucose-1-phosphate
 - glucose-6-phosphate
 - UDP-glucose
 - glucagon
18. The chemiosmotic theory of oxidative phosphorylation hypothesizes that there is
- a high energy phosphorylated intermediate ($X\sim P$) in electron transport which transfers its phosphate to ADP to form ATP.
 - movement of electrons across the inner mitochondrial membrane.
 - movement of electrons through the ATP synthesis protein
 - movement of protons through the ATP synthesis protein
 - movement of NADH through the ATP synthesis protein
19. $NADP^+$ is reduced to NADPH during
- the pentose phosphate shunt
 - glycolysis
 - β -oxidation
 - transamination
 - Krebs Cycle
20. If malonyl-CoA is synthesized from radioactive (^{14}C -labeled) carbon dioxide and used for fatty acid synthesis, the final product (fatty acid) will have radioactive carbon in
- every carbon.
 - every other carbon.
 - only the carbon which is closest to the carboxyl carbon
 - only the carbon which is farthest from the carboxyl carbon.
 - none of the carbons
21. Movement of H^+ across the inner mitochondrial membrane
- is always an endergonic process (i.e. $\Delta G > 0$)
 - is always an exergonic process (i.e. $\Delta G < 0$)
 - is usually neither endergonic nor exergonic (i.e. $\Delta G = 0$)
 - may be endergonic or exergonic depending upon the direction of movement
 - cannot occur under any circumstances

22. Which of the following can **NOT** be metabolically converted to glucose?
- a) pyruvate
 - b) Acetyl coA
 - c) oxaloacetate
 - d) None of the above can be converted
 - e) All of the above **can** be converted
23. Glutamic acid was synthesized with ^{15}N in the α -amino group and ^{14}C in the R group. An experiment was carried out in which this [^{15}N , ^{14}C]-labeled glutamic acid was added to cells; there was found to be a rapid production of $^{15}\text{NH}_3$ by the enzyme glutamate dehydrogenase. A [^{14}C]-labeled product of this reaction is likely to be
- a) aspartate
 - b) urea
 - c) α -ketoglutarate
 - d) oxaloacetate
 - e) pyruvate
24. Uracil is converted to thymine by the addition of a methyl group to
- a) uracil
 - b) UMP
 - c) dUMP
 - d) UDP
 - e) dUDP
25. Acyl carrier protein (ACP) is a "carrier" of fatty acids during
- a) transport across a membrane
 - b) catabolism
 - c) biosynthesis
 - d) formation of triglycerides
 - e) transport through the blood