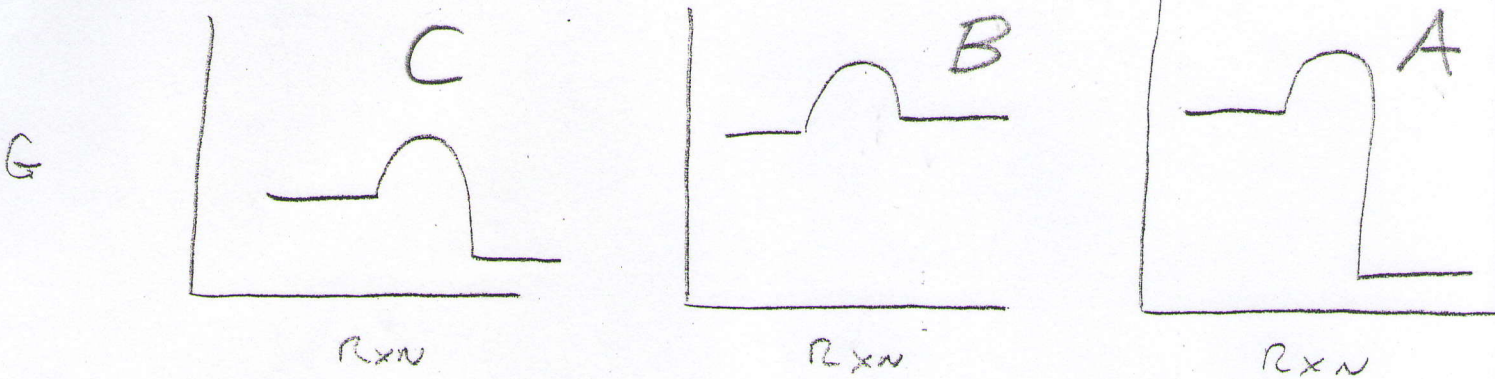


BIOSC 1820
 Metabolic Pathways and Regulation
 Spring, 2010
 Prof. Jeffrey L. Brodsky
 Quiz #3
 February 24, 2010

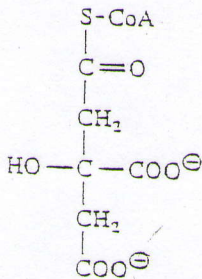
NAME: KEY

1. The following three free energy versus reaction graphs profile the delivery of electrons from NADH to (A) oxygen and (B) pyruvate, and from (C) FADH to oxygen. Label each graph with A, B, or C. (2 points)



2. The following molecule is an intermediate in the reaction catalyzed by which enzyme?

Citrate Synthase

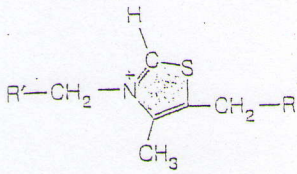


3. Which of the following does NOT inhibit the catalytic activity of the pyruvate dehydrogenase complex?

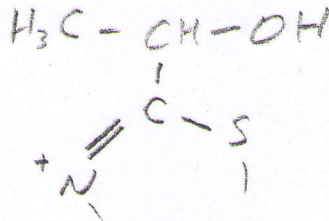
- A. ATP
- B. calcium
- C. acetyl-coenzyme A
- D. NADH
- E. None of the above—they all inhibit the activity of this enzyme

Full

4. What is the name of the depicted vitamin/enzyme co-factor (only a portion of the entire molecular is shown)? Draw the structure of this co-factor covalently bound to the two carbon carbohydrate that we discussed in handout #5.

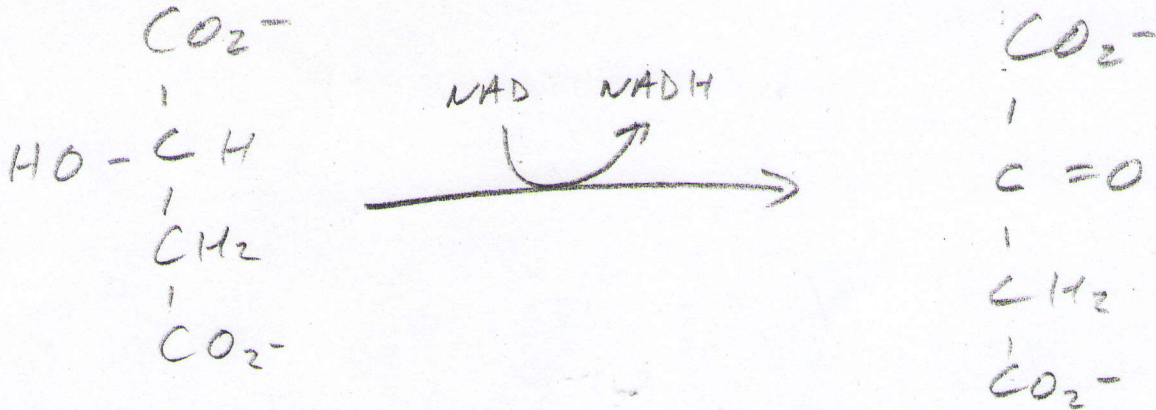


Thiamine pyrophosphate

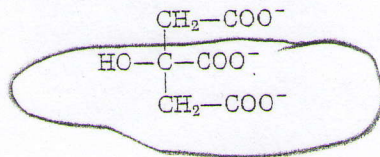


5. Draw the reaction, including the structures of the reactants and products, which represents the most unfavorable step in the TCA cycle (any cofactors that might be utilized can be abbreviated—you don't have to draw their structures):

Malate dehydrogenase



6. What is the name of the following molecule? Assuming that this molecule was made via the glyoxylate cycle, circle the portion of the molecule that derived from oxaloacetate:

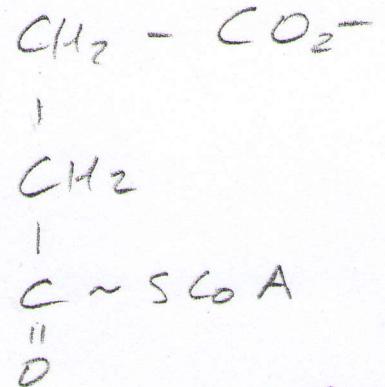
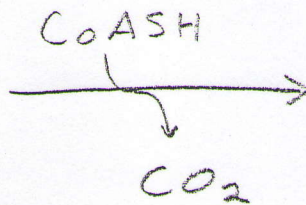
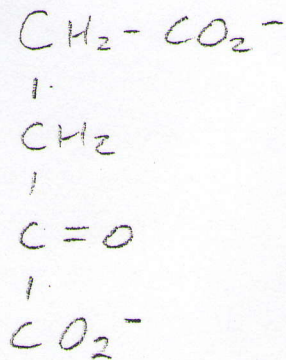


7. What is the name of the enzyme that generates FADH₂ in the TCA cycle?

Succinate dehydrogenase

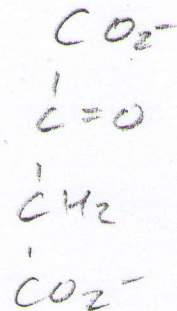
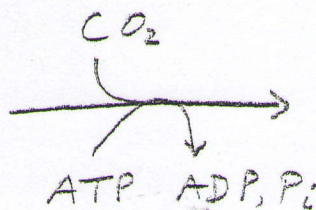
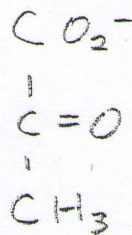
8. Draw the structures AND give the full names of the products of the following reactions:

A.



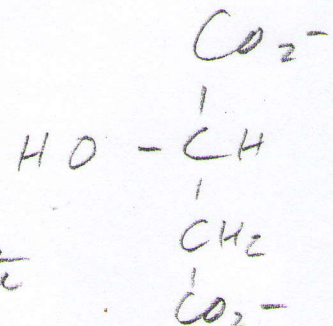
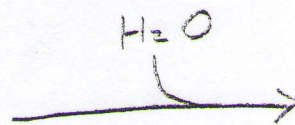
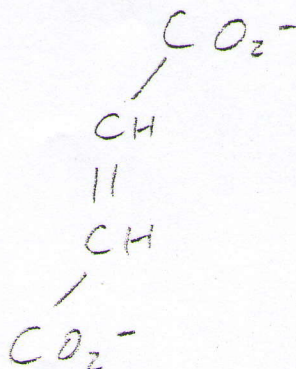
Succinyl-Coenzyme A

B.



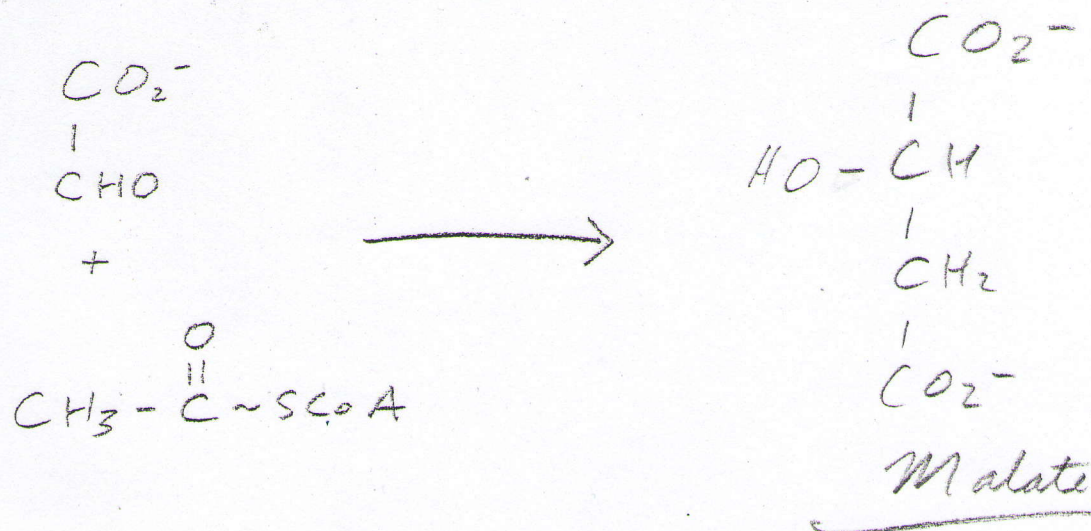
Oxaloacetate
(anapleurotic rxn)

C.

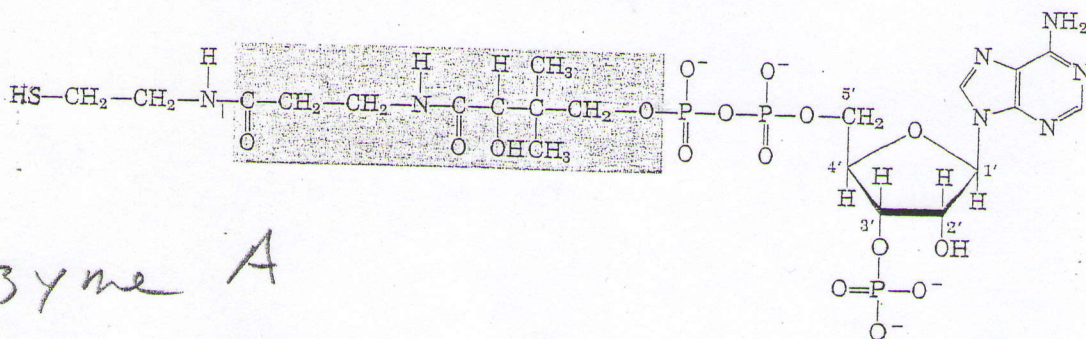


Malate

D.



9. What is the FULL name of the following cofactor?



10. What is the name of the enzyme that generates GTP in the TCA cycle?

Succinyl CoA synthetase

11. Which amino acid is covalently bound to the lipoic acid in E2 acetyl transferase complexes?

Lysine