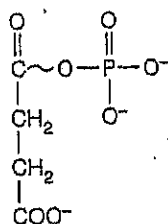


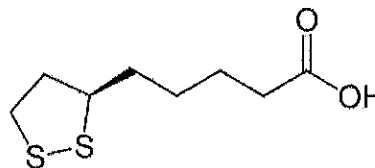
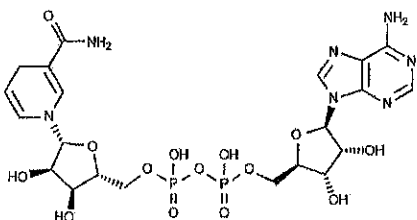
BIOSC 1820
Metabolic Pathways and Regulation
Spring, 2012
Prof. Jeffrey L. Brodsky
Quiz #3
February 22, 2012

NAME: _____

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



2. Are the following depicted cofactors in the (A) oxidized or (B) reduced forms?



3. Draw the reaction—including the structures AND the names of the reactants and products—that is unique to the glyoxylate cycle and that is highly favorable (if there are co-factors used in this reaction, their name(s) can be abbreviated) (2 points):

4. Each of the following enzymes are activated by calcium *except*:

- A. Pyruvate dehydrogenase
- B. Isocitrate dehydrogenase
- C. α -ketoglutarate dehydrogenase
- D. Malate dehydrogenase
- E. None of the above, each of these enzymes is activated by calcium

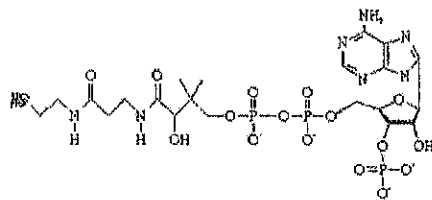
5. Which of the following molecules is exported from the mitochondria and then serves as a precursor for the synthesis of hexoses and other sugars in plant cells?

- A. Malate
- B. Oxaloacetate
- C. Fumarate
- D. Acetyl CoA
- E. None of the above

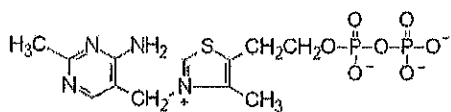
6. In the absence of NAD, which metabolite (that was discussed in handout #5) do you think is most likely to accumulate in mitochondria? (Please draw the structure AND state the name)

7. What are the FULL names of the following vitamins/cofactors

A.

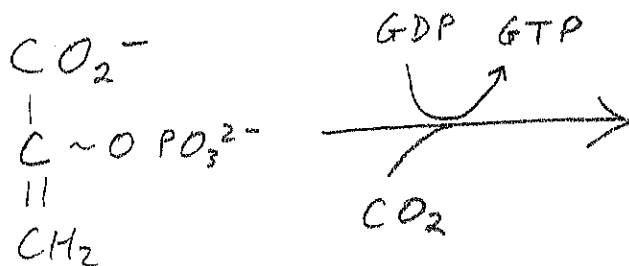


B.

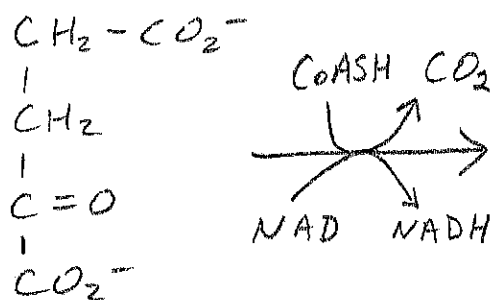


8. Draw the structures AND give the names of the products of the following reactions:

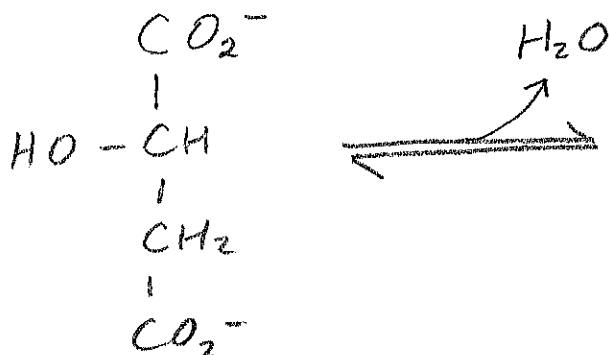
A.



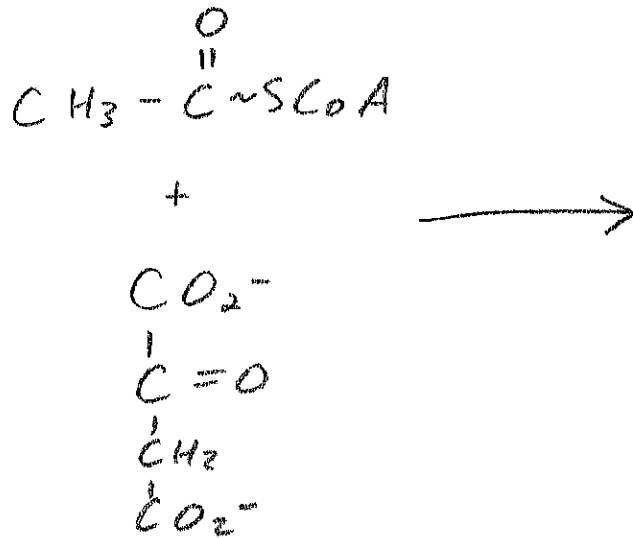
B.



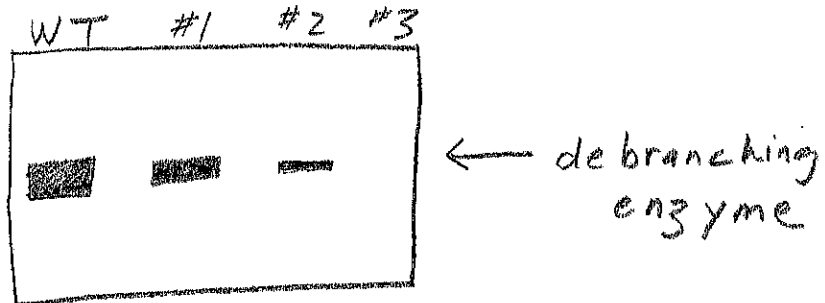
C.



D.



9. Cori Disease is type IIIa Glycogen Storage Disease caused by a defect in the glycogen debranching enzyme. Two different types of mutations in the gene encoding this enzyme have been identified. You have recently analyzed the levels of this enzyme in a wild type (WT, i.e., healthy) individual and in three different patients by western blot analysis. The results are shown below:



What can you infer about the genotype of each of the three patients?

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