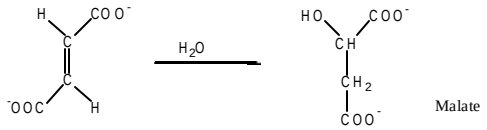
BIOSCI 1820
QUIZ #2
31 JAN 2001

# KEY

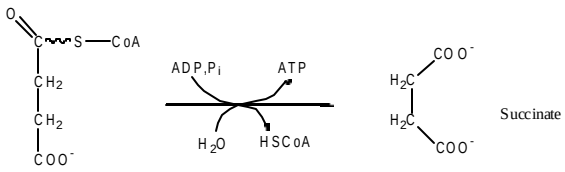
1. Draw the structures of the products of the following reactions:

A.



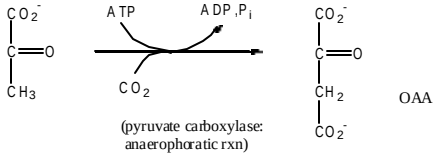

Malate

B.




Succinate

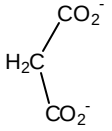
C.




(pyruvate carboxylase: anaerophoratic rxn)

OAA

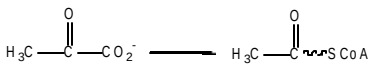
2. Draw the structure of the inhibitor that causes succinate to accumulate during the TCA cycle (HINT: think about the structure of succinate)?




Malonate

(inhibits succinate dehodrogynase)

3. Consider the following reaction:




**A.** **B.**

What is the **full name** of "A"? Pyruvate

What is the **full name** of "B"? Acetyl - Coenzyme A

Give the **full names** of any three of the five cofactors required for the reaction catalyzed by this enzyme complex:

Thiamine (pyrophosphate)

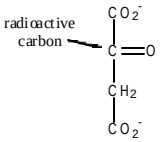
Flavin Adenine Dinucleotide

Coenzyme A

Lipoic Acid

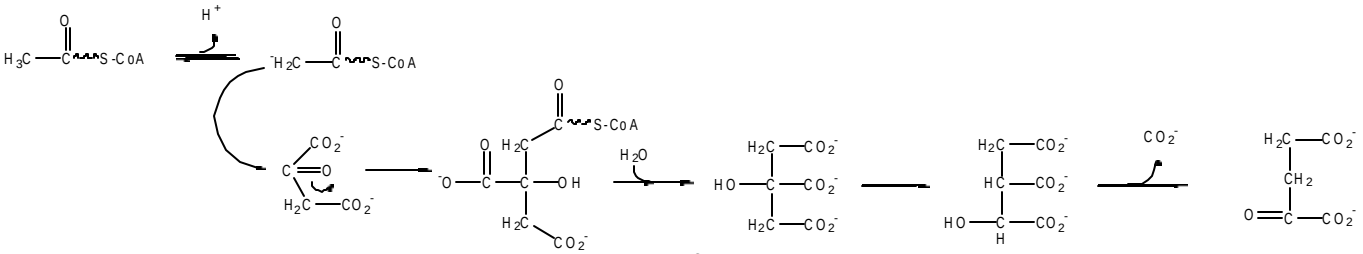
Nicotinamide Adenine Dinucleotide

4. The following molecule is radiolabled at the indicated carbon:




What is the full name of this metabolite? Oxaloacetate (OAA)

If this molecule were to enter the TCA cycle, indicate (with an arrow) which atom(s) on α-ketoglutarate would be labled?



α-KG

5. There is one dehydrogenase in the Krebs/TCA cycle that uses flavin adenine dinucleotide instead of nicotinamide adenine dinucleotide as the primary electron acceptor. What is the full name of this enzyme?

Succinate Dehydrogynase

6. Would the activity of pyruvate dehydrogenase (A) INCREASE or (B) DECREASE if:

i) there was an increase in the concentration of NADH? B

ii) there was an increase in the concentration of calcium? A

Explain how this regulation of the enzyme occurs at the molecular level:

Pyruvate dehydrogynase alters between an active, dephosphorylated form of the enzyme, and an inactive, phosphorylated form. The kinase is activated by NADH and Acetyl-CoA, while the phosphatase (favors the active form) is activated by $Ca^{2+}$ and $Mg^{2+}$

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