

NAME: _____ KEY

Bioc 460 – Spring 2008
Quiz #3A (4/4/2008) ANSWERS (Form X)
20 points

1. (6 pts) There are three primary biochemical mechanisms that mediate intracellular signal transduction. One of them is altered rates of gene expression, what are the other two?

1. Protein conformational changes

2. Covalent protein modifications

2a. (2 pts) Fill in the two blanks with one word that best completes the sentence:

Life as we know it on planet earth would not be possible without sunlight which provides energy for the chemical conversion process called photosynthesis.

2b.(2 pts) Circle the most correct underlined words describing the terms *oxidant* and *reduction*:

An **oxidant** accepts/donates electrons and **reduction** is the gain/loss of electrons.

3. (6 pts) The phosphofructokinase 1 (PFK-1) reaction in glycolysis is highly regulated. Fill in the blanks with the one word that *best* describes this regulation.

PFK-1 enzyme activity is activated when the energy charge in the cell is low. Elevated citrate levels in the cytosol decrease PFK-1 activity. Increased cytosolic [citrate] indicates that the flux through the citrate cycle (glycolytic is ok) pathway is decreasing. It makes sense that PFK-1 activity is activated by AMP because this means the energy charge in the cell is low.

4. (4 pts) The pyruvate dehydrogenase (PDH) reaction is a key regulated step in metabolism. Circle true (T) or false (F) for each statement describing the role of coenzymes.

T F a. The coenzymes NAD⁺ and FAD function as electron carriers in the PDH reaction.

T F b. Thiamin pyrophosphate is the reactive group at the end of the E2 "ball and chain."

T F c. Arsenite reacts with the lipoamide group, leading to inactivation of PDH activity.

T F c. Acetyl-Co A shuttles acetate into the citrate cycle through a covalent amide linkage.