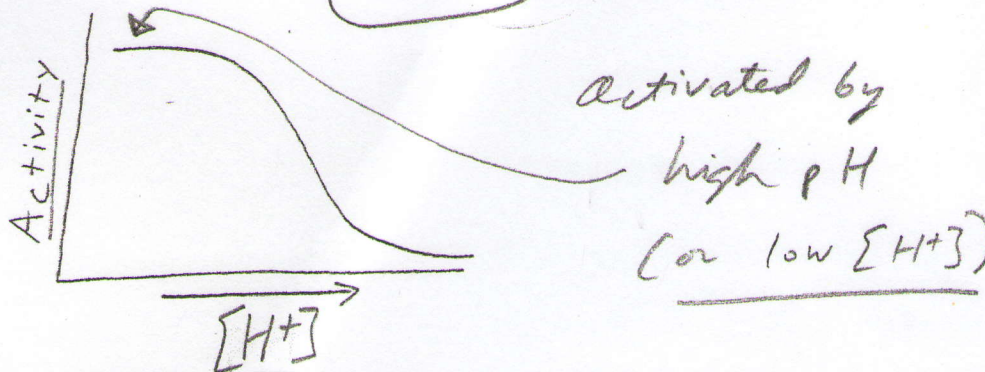


BIOSC 1820
 Metabolic Pathways and Regulation
 Spring, 2010
 Prof. Jeffrey L. Brodsky
 Quiz #6
 April 14, 2010

NAME: KEY

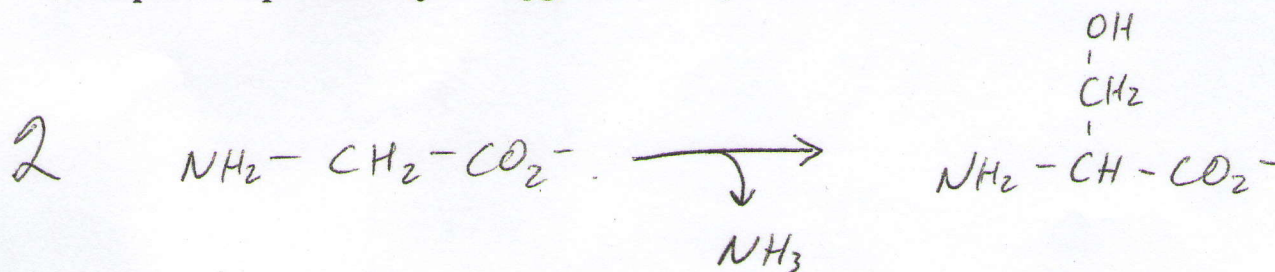
1. The following plot shows an activity relationship for RUBISCO. Label the X-axis to indicate whether the proton concentration ($[H^+]$) or pH is increasing along this axis:



2. Assume that RUBISCO reacted with a radioactive molecule of O_2 . Draw the product(s) of this reaction and indicate the position(s) of the radioactive oxygen (2 points).



3. Draw the structures of the reactants and products of the reaction catalyzed by the abundant enzyme that is pyridoxal phosphate-requiring and that detoxifies one of the products produced by the oxygenase activity of RUBISCO:



4. Electrons generated from the light reactions of photosynthesis can be delivered from

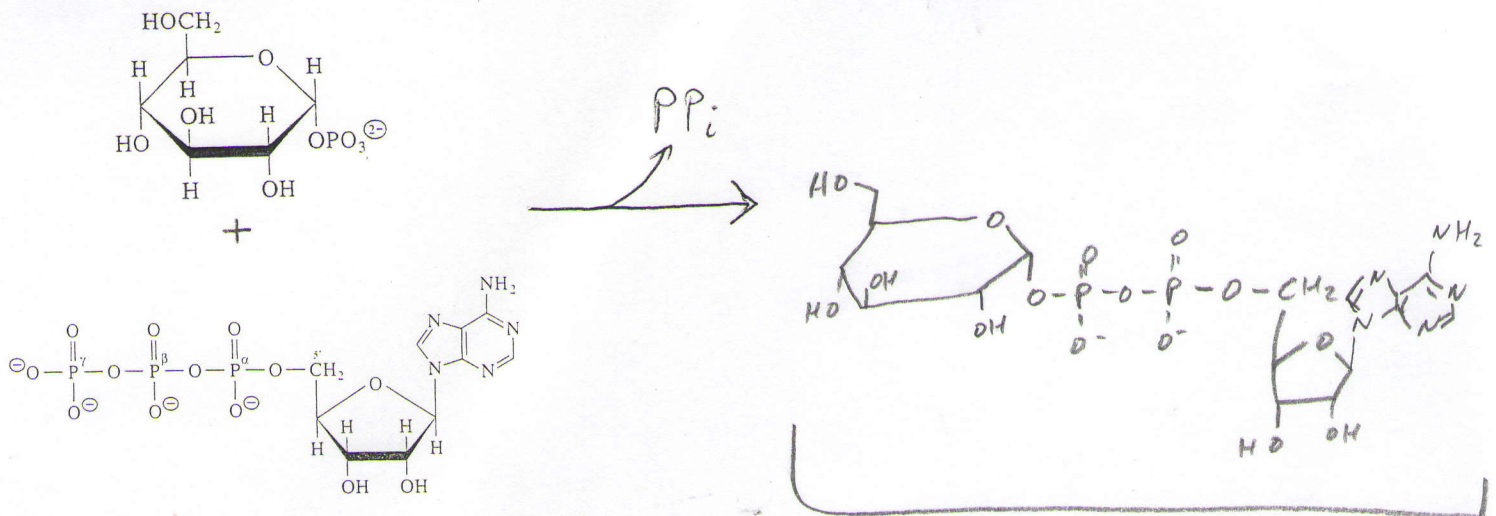
ferredoxin to thioredoxin,

and then on to target enzymes in the Calvin Cycle, which may either activate or inhibit them (please use full names and not abbreviations).

5. In C4 plants, what is the name of the cell type that is gas-impermeable?

Bundle sheath cells

6. Draw the structure of the product of the following reaction:

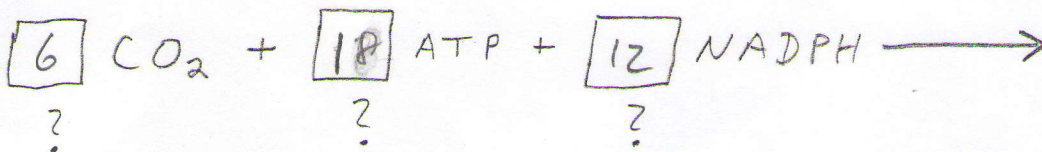


Name one way in which the enzyme that catalyzes the reaction shown above is regulated:

Activated by

- low phosphate
- High 3-phosphoglycerate

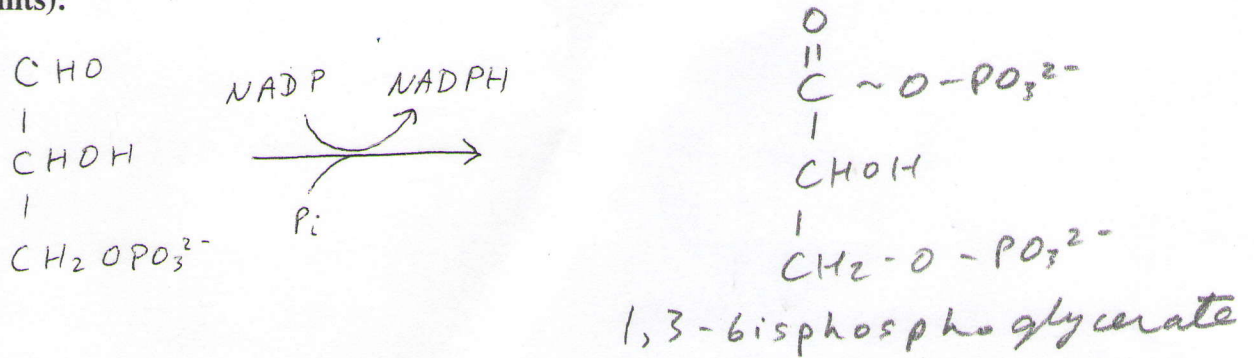
7. Fill in the missing values that are required to synthesize 1 hexose sugar:



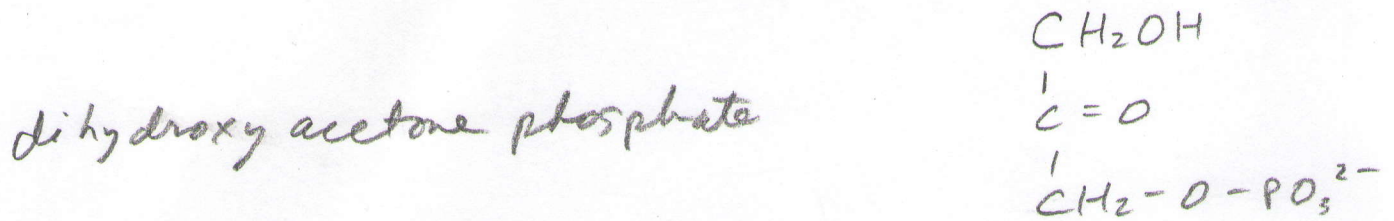
8. Each of the following conditions would favor glycolysis in a plant cell, EXCEPT:

- A. An increase in inorganic phosphate
- B. An increase in fructose-2,6-bisphosphate
- C. An increase in the concentration of PFK-2
- D. A decrease in the concentration of 3-phosphoglycerate
- E. None of the above—each condition would favor glycolysis

9. Draw the structure and give the name of the product of the following reaction (2 points):

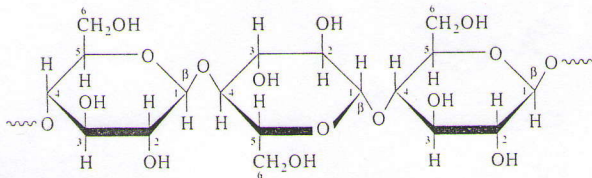


10. What is the name and what is the structure of the molecule that “delivers” reducing equivalents to the cytosol from the chloroplast stroma in plants?



11. Starch granules are stored in amyloplasts in plant cells.

12. The following molecule is found in which polymer?



cellulose