(26) **Today**

Chap 13.1: Glycolysis (skip 13.1.3)

Next Class (27)

Chap 13.1: Glycolysis (skip 13.1.3)

(28) **Second Class from Today**

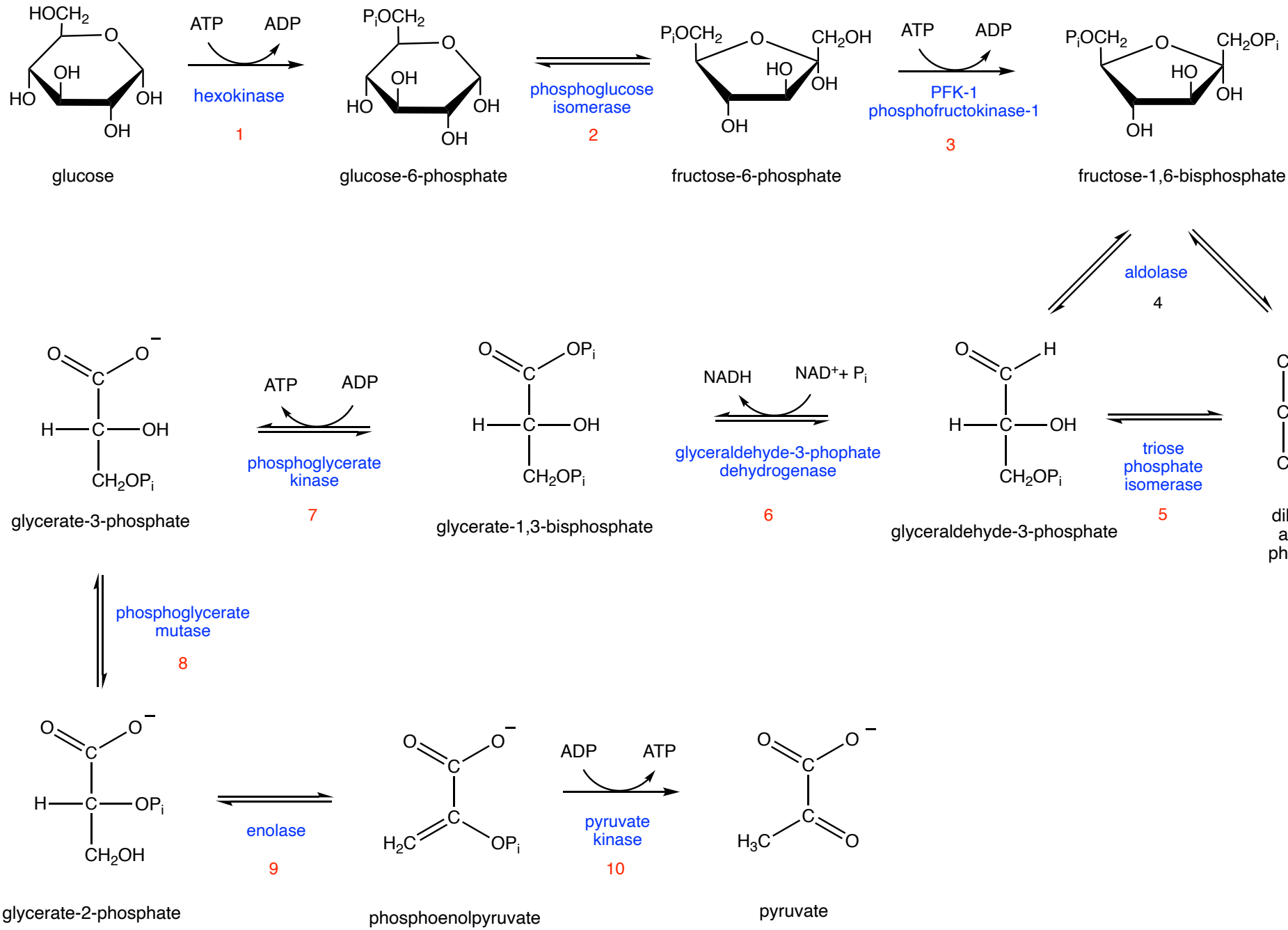
Chap 13: Glycolysis Energetics and Gluconeogenesis

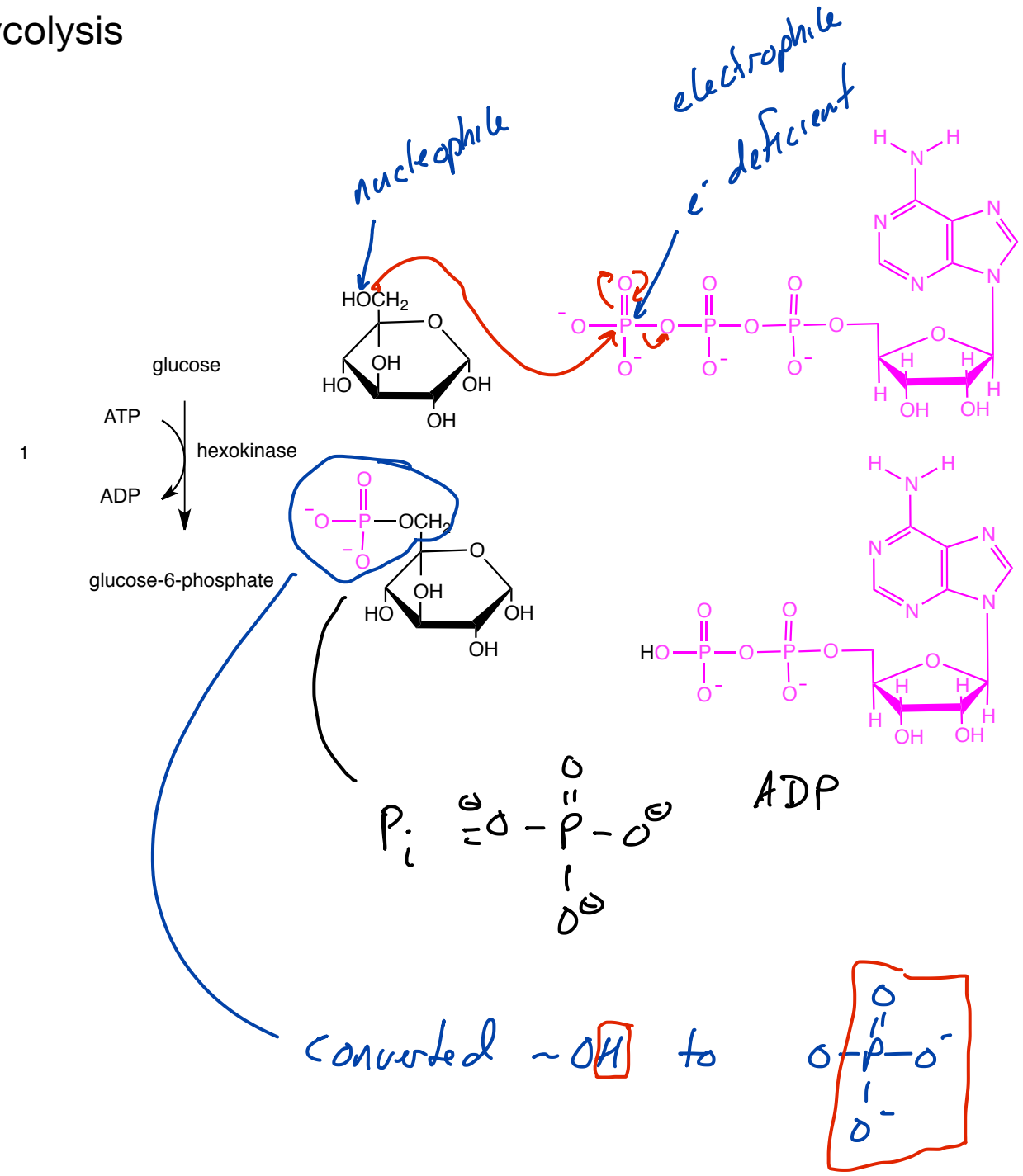
Third Class from Today (29)

Chap 13: Gluconeogenesis

Rework test 2 and Hand in on Wednesday, April 16

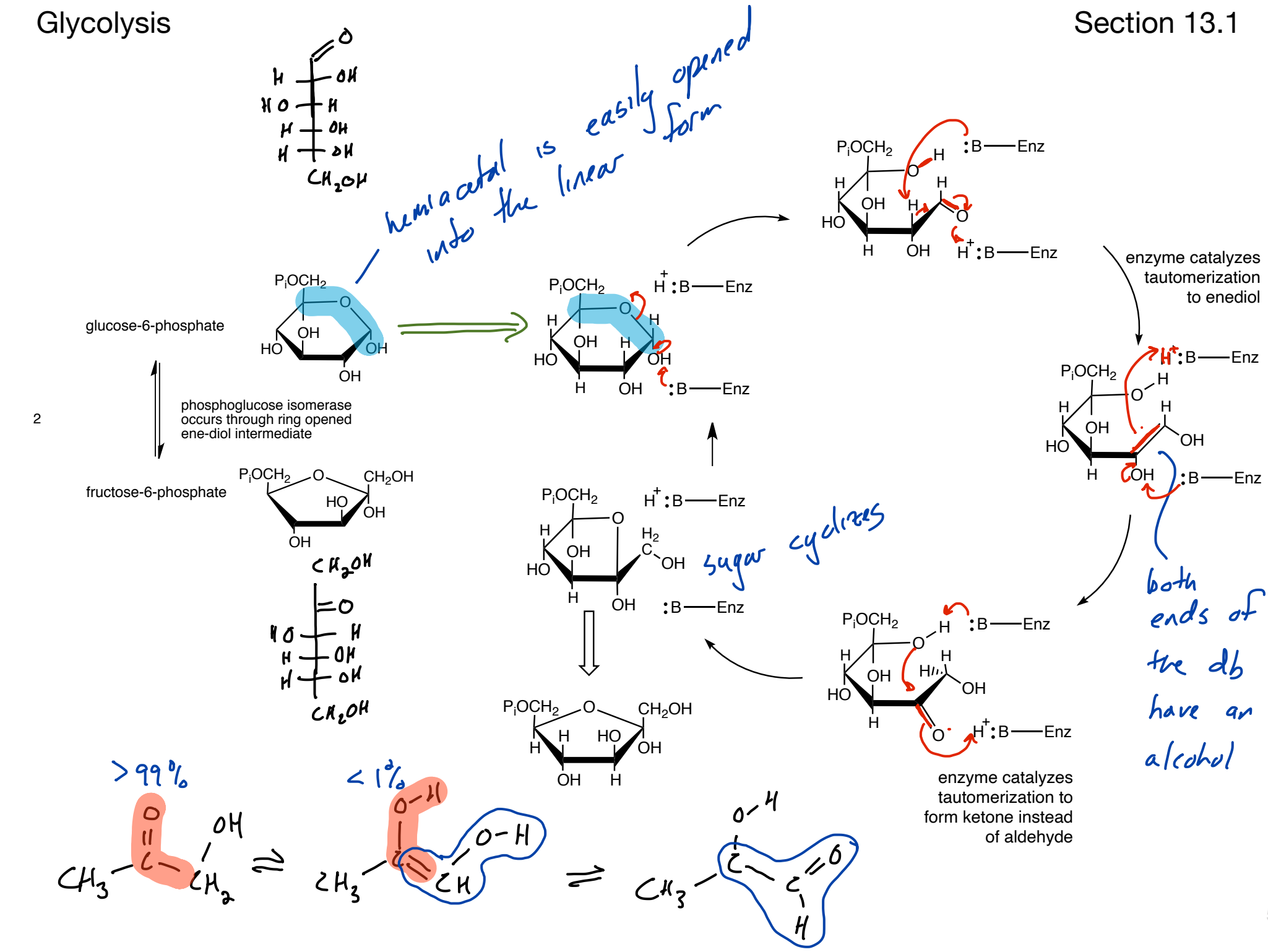
Please hand in assignment 2.

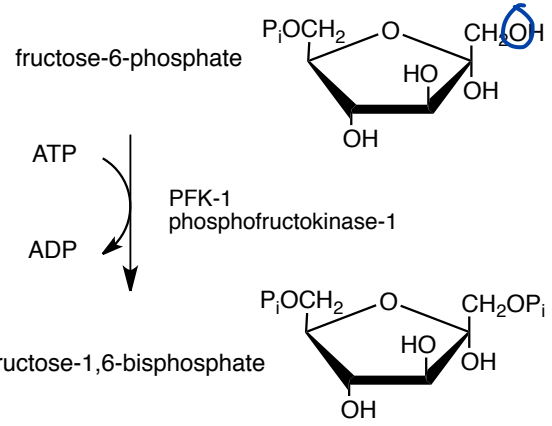

glucose
ATP
ADP
hexokinase
1
glucose-6-phosphate
phosphoglucose isomerase
2
fructose-6-phosphate
ATP
ADP
PFK-1 phosphofructokinase-1
3
fructose-1,6-bisphosphate
aldolase
4
dihydroxy acetone phosphate
triose phosphate isomerase
5
glyceraldehyde-3-phosphate
NADH
NAD+ + Pi
glyceraldehyde-3-phophate dehydrogenase
6
glycerate-1,3-bisphosphate
ATP
ADP
phosphoglycerate kinase
7
glycerate-3-phosphate
phosphoglycerate mutase
8
glycerate-2-phosphate
enolase
9
phosphoenolpyruvate
ADP
ATP
pyruvate kinase
10
pyruvate



negatively charged sugar will not exit the cell

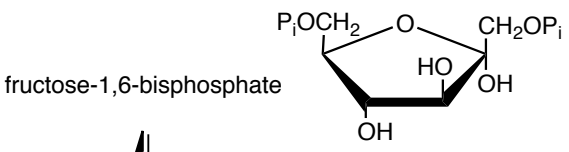
activated OH group on 6th C atom


glucose-6-phosphate
fructose-6-phosphate
phosphoglucose isomerase occurs through ring opened ene-diol intermediate
hemiacetal is easily opened into the linear form
enzyme catalyzes tautomerization to enediol
sugar cyclizes
both ends of the db have an alcohol
enzyme catalyzes tautomerization to form ketone instead of aldehyde
>99%
<1%

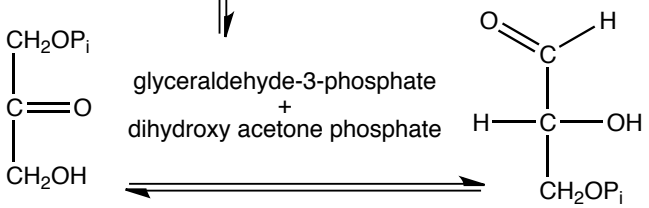


3

another nucleophilic attack of alcohol O on ATP P. activated a 2nd O atom on the sugar



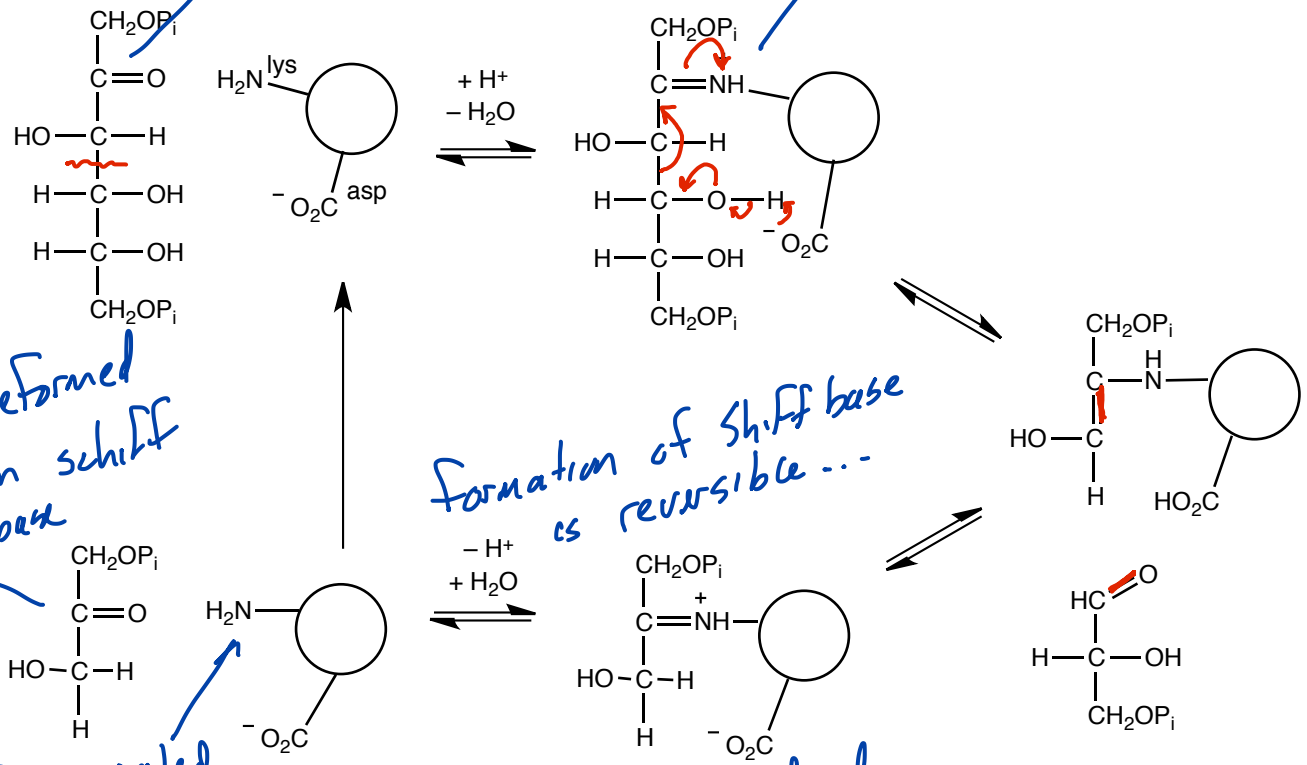
4

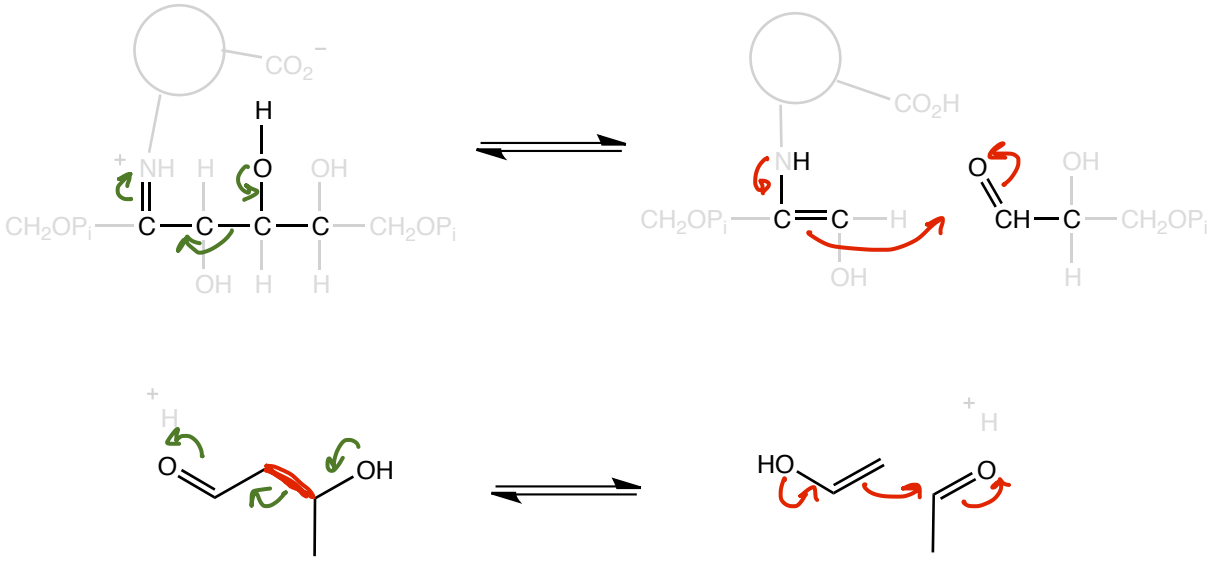


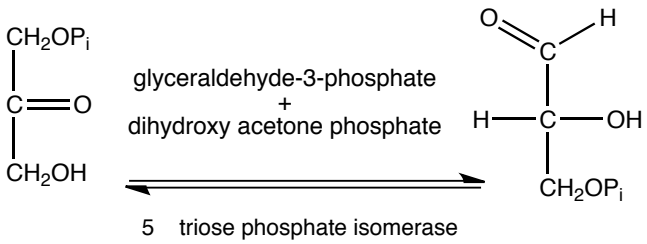
5 triose phosphate isomerase

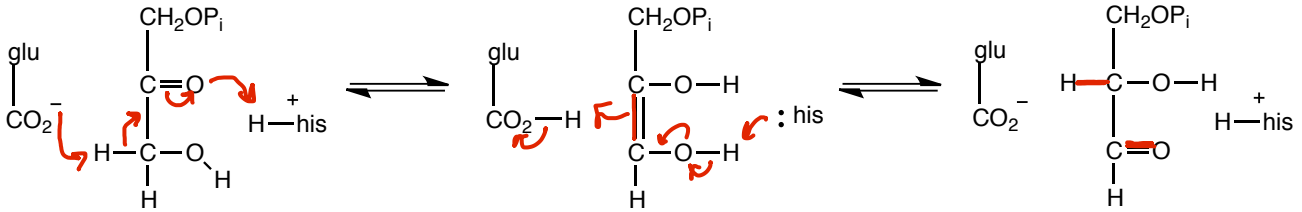
the position of the C=O determines which C-C bond can break. if C=O is on C_1 then a 2 carbon sugar + a 4 carbon sugar would result

Schiff base... the C atom is more electrophilic









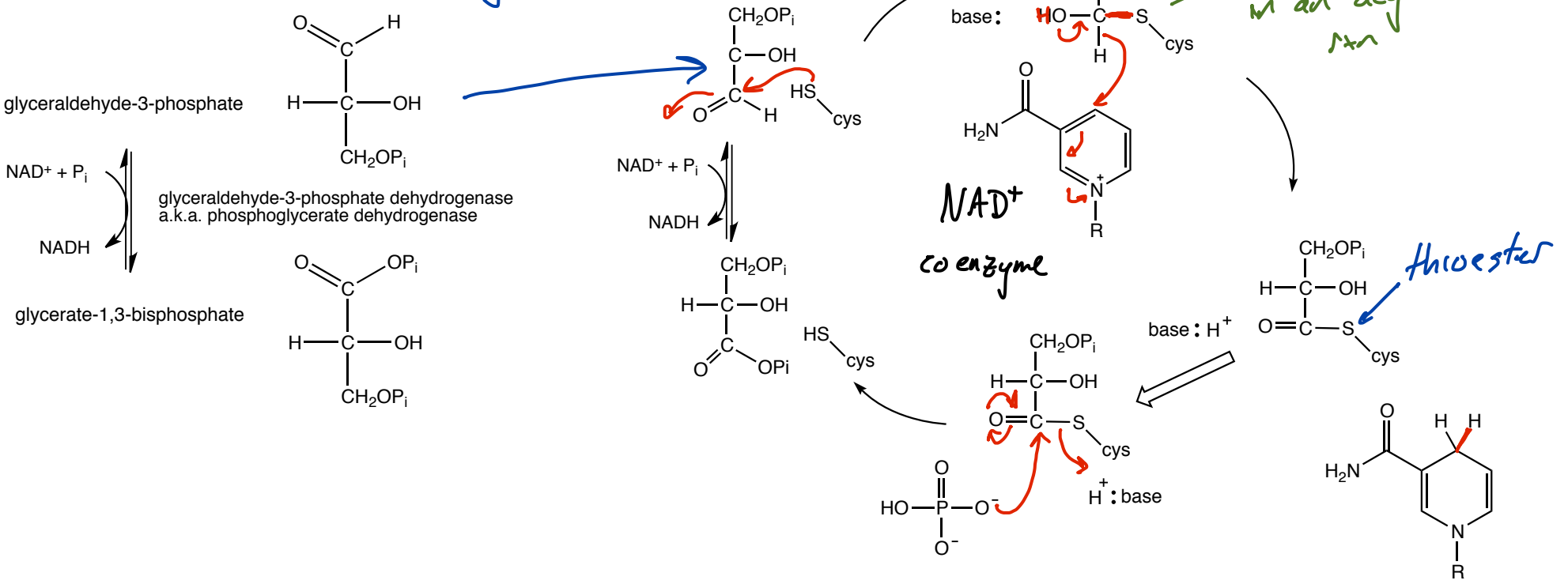
ketone enediol aldehyde

this is like the reaction where glu-6-Pi became fru-6-Pi

fructose enediol glucose

This rxn adds a phosphate, but we are not consuming an ATP

covalent catalysis using a nucleophilic S atom



6

coenzyme - consumed during reaction
- regenerated elsewhere
- returned to the active site

an H^+ and $2e^-$ are transferred to NAD^+ to form NADH