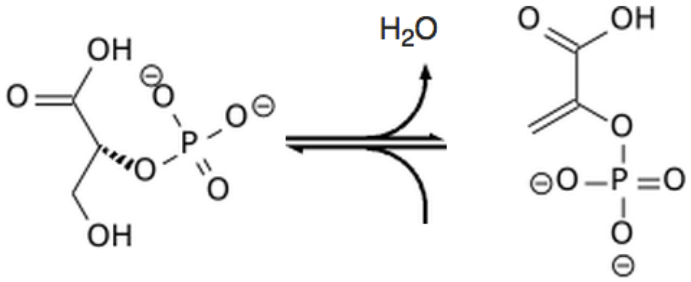
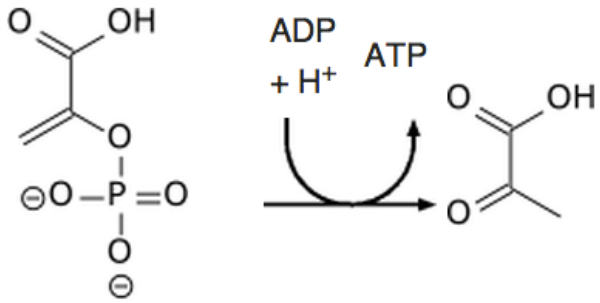
CONCEPT: GLYCOLYSIS

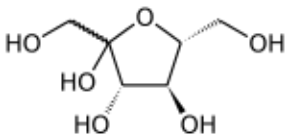
9. Enolase ($\Delta G'^{o}$ = 7.5 kJ/mol) 2-phosphoglycerate → phosphoenolpyruvate (PEP) + H_2O

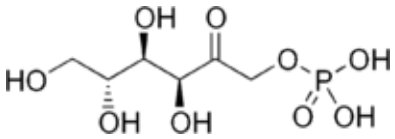


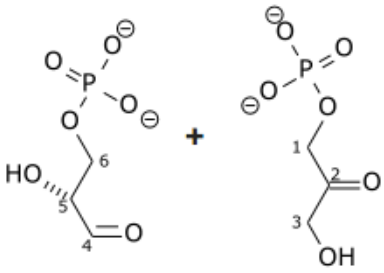
10. Pyruvate kinase ($\Delta G'^{o}$ = -31.4 kJ/mol) PEP + ADP → pyruvate + ATP
    - □ Pyruvate comes out of the reaction in the enol form, but immediately converts to the keto form



- Reactions 1, 3, 10 are the major drivers of glycolysis because they have -ΔG, and are very favorable
- Other molecules can feed into glycolysis, but it always costs 2 ATP
    - □ Glucose → glucose 6-phosphate
    - □ Lactose → glucose + galactose
    - □ Mannose → mannose 6-phosphate → fructose 6-phosphate
    - □ Fructose → fructose 1-phosphate → glyceraldehyde + DHAP → G3P







- Glycerol → glycerol 3-phosphate → DHAP → G3P
    - □ Uses 1 ATP, and generates 2 ATP, but it also generates 2 NADH
    - □ Generates excess NADH for glycolysis to be sustained with fermentation, can only be used in aerobic conditions
- Glycogen phosphorylase breaks down glycogen to be used as glucose by the cell
    - □ Glycogen → glucose 1-phosphate → glucose 6-phosphate