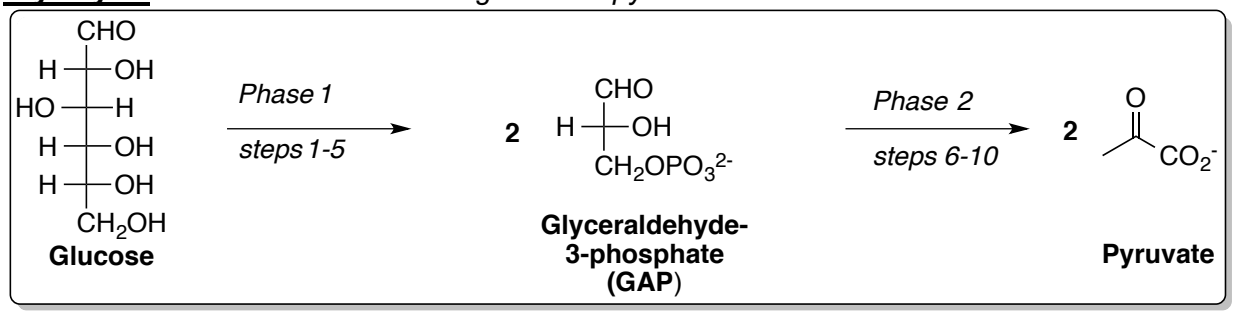
CHEM 109, Lecture 9

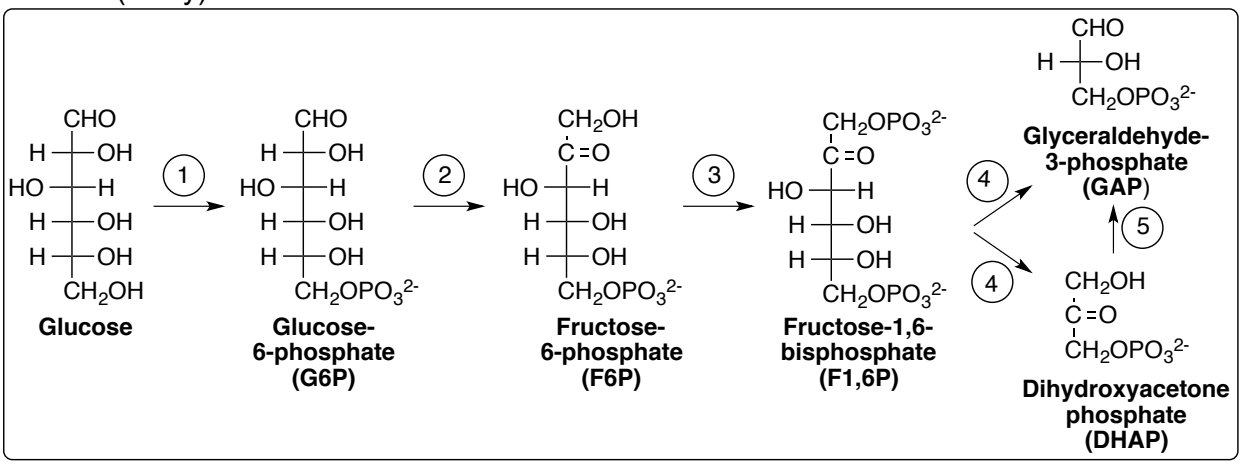
Glycolysis

– Active site examples – types of binding, roles of co-factors & AA residues

Glycolysis - *Know the structures of glucose & pyruvate.*



Phase 1 (today)

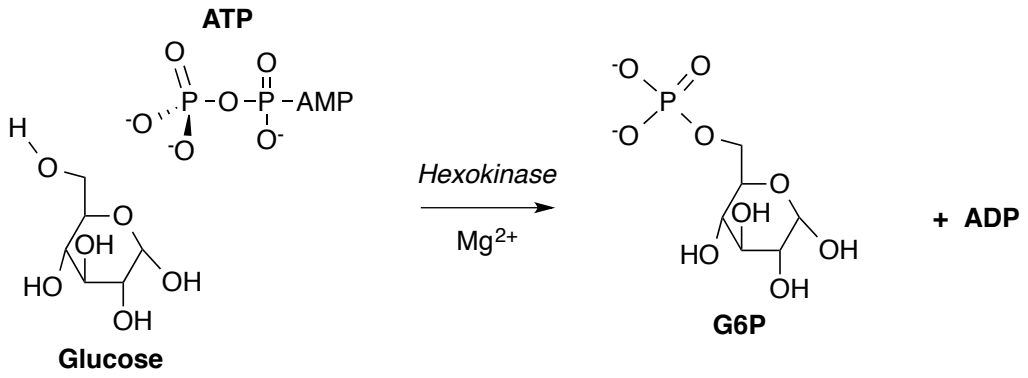


Mechanism Overview in Phase 1 of Glycolysis

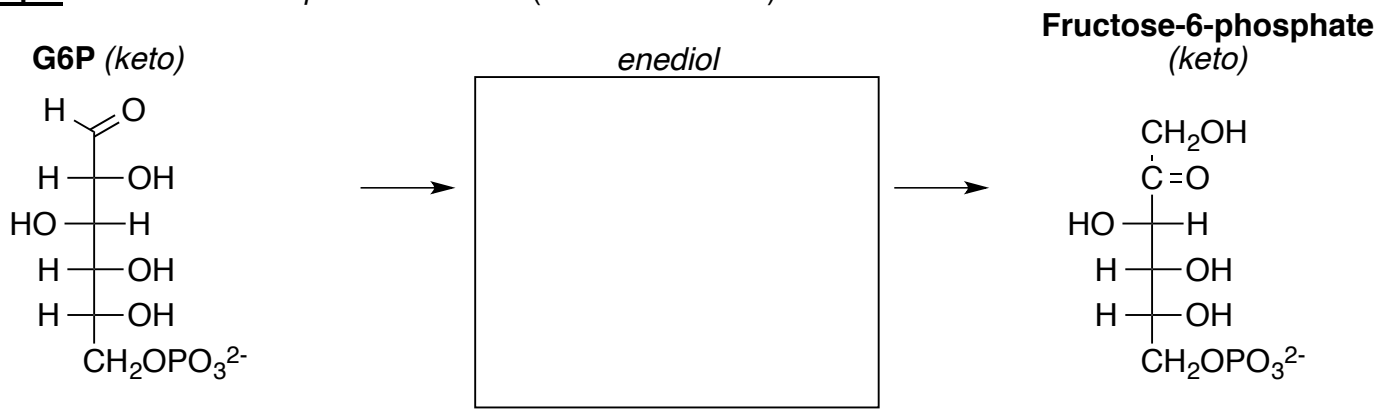
- Nucleophilic Acyl Substitution
- Tautomerization

- Nucleophilic Addition with Dehydration
- Retro-aldol

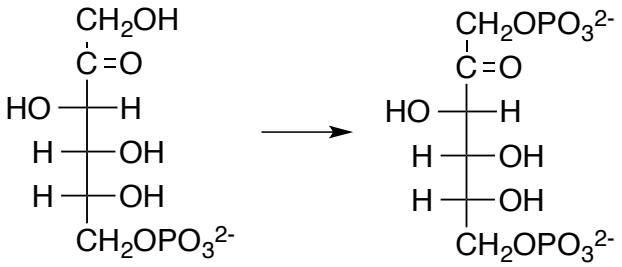
Step 1 – *Hexokinase* active site



Step 2 – *Glucose-6-Phosphate Isomerase* (Tautomerizations)

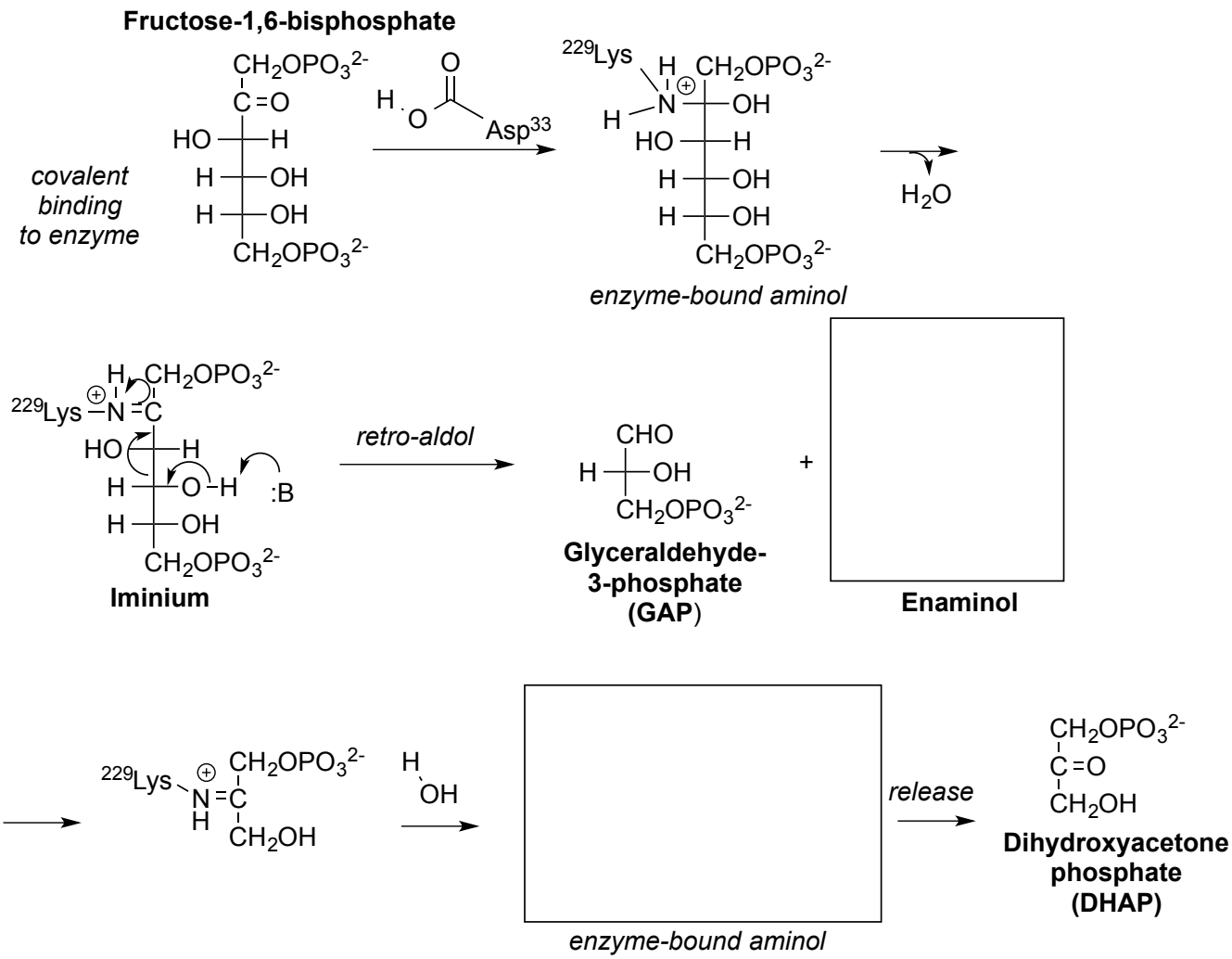


Step 3 – *Phosphofructokinase* (nearly identical to step 1 - try on your own)



<u>Step 4</u> – *Aldolase* (see HW #1.10 for simpler – not real - version)

1. Covalent binding of **F-1,6-BP** to active site *via* **iminium** bond to a lysine residue
2. Retro-aldol to form **GAP** & **enaminol**
3. Release of **DHAP** from lysine residue



<u>Step 5</u> – *Triose Phosphate Isomerase*

Next time…Phase 2 – Profit!