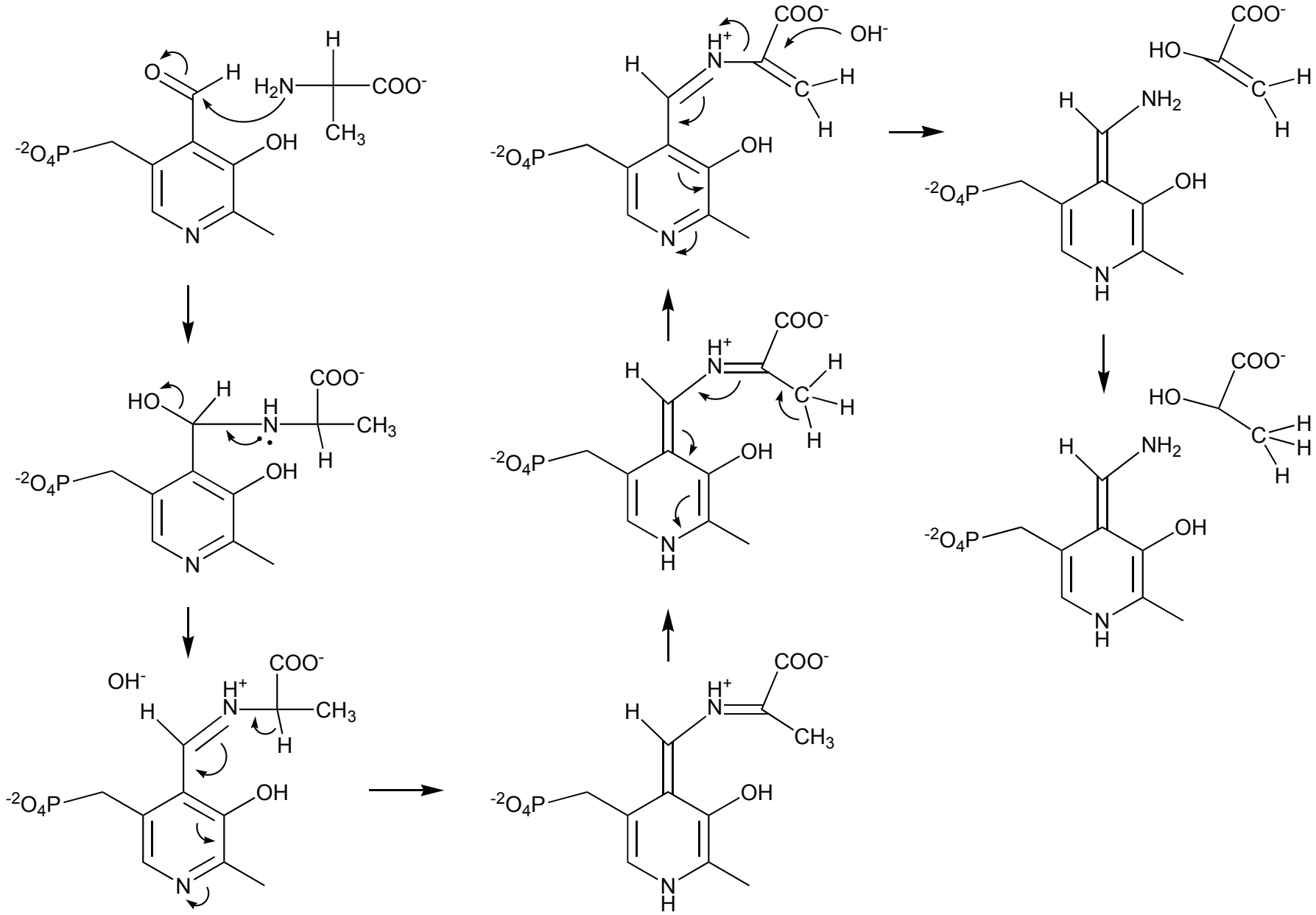
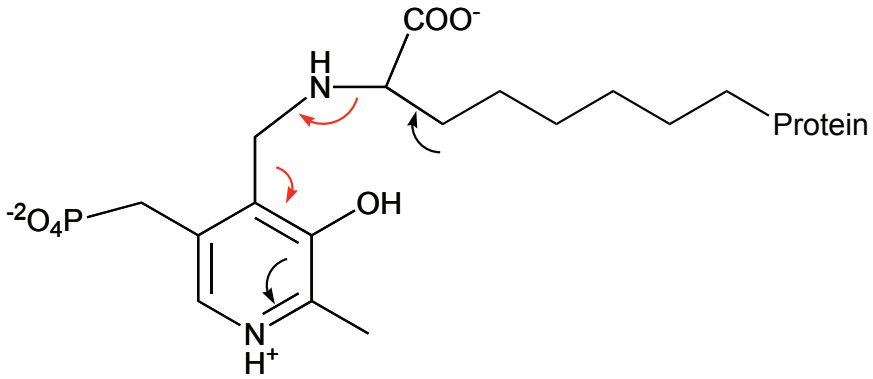
Ala reacts with pyridoxal 5'-phosphate



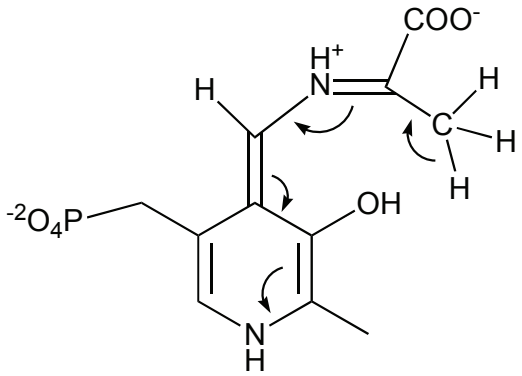
Ala reacts with pyridoxal 5'-phosphate



Transition State Analog
(stable)

Competitively
inhibits the reaction

Bill Jencks - raise an
antibody to the TS
analog. Should stabilize
TS and therefore
catalyze reaction



Transition State
(meta/un)-stable

General Acid-Base Chemistry in Triosephosphate Isomerase

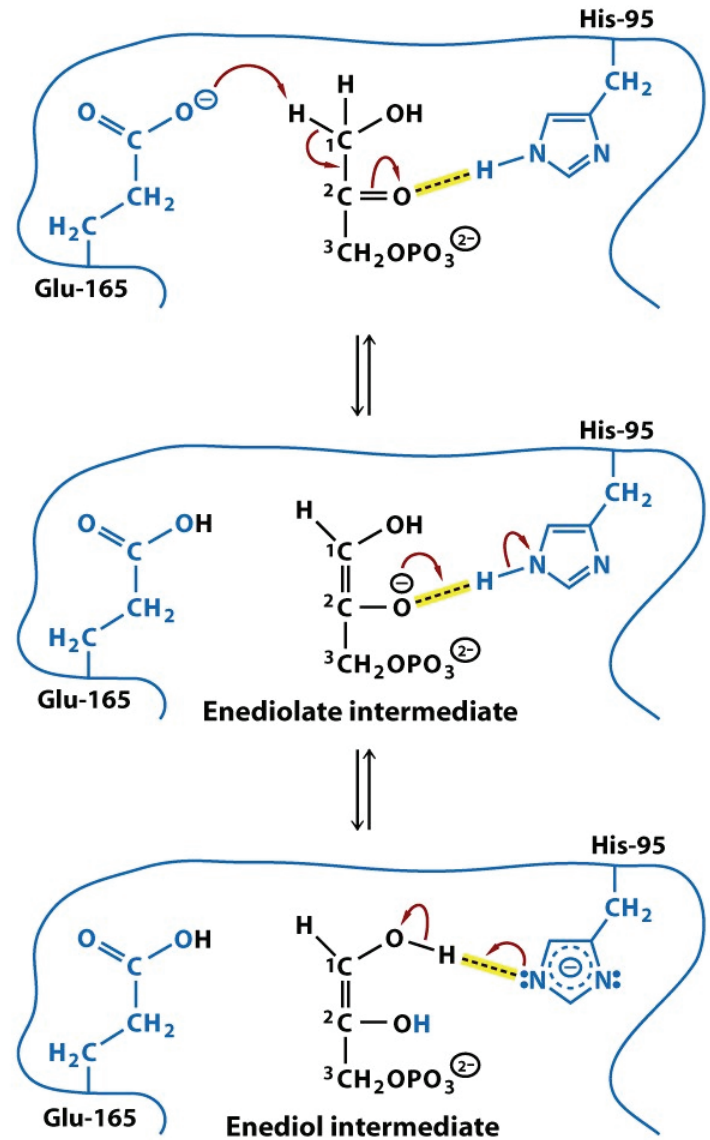


Figure 6-7 part 1 Principles of Biochemistry, 4/e

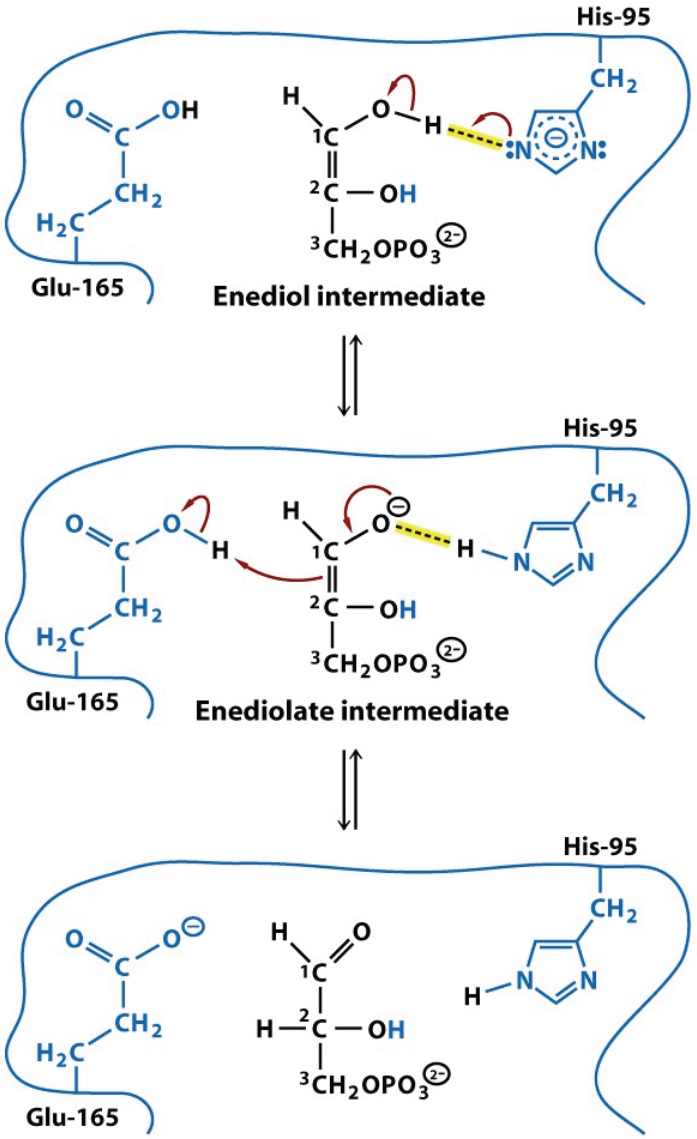
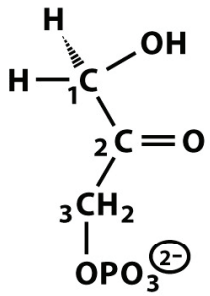


Figure 6-7 part 2 Principles of Biochemistry, 4/e

General Acid-Base Chemistry in Triosephosphate Isomerase



Dihydroxyacetone phosphate (substrate)

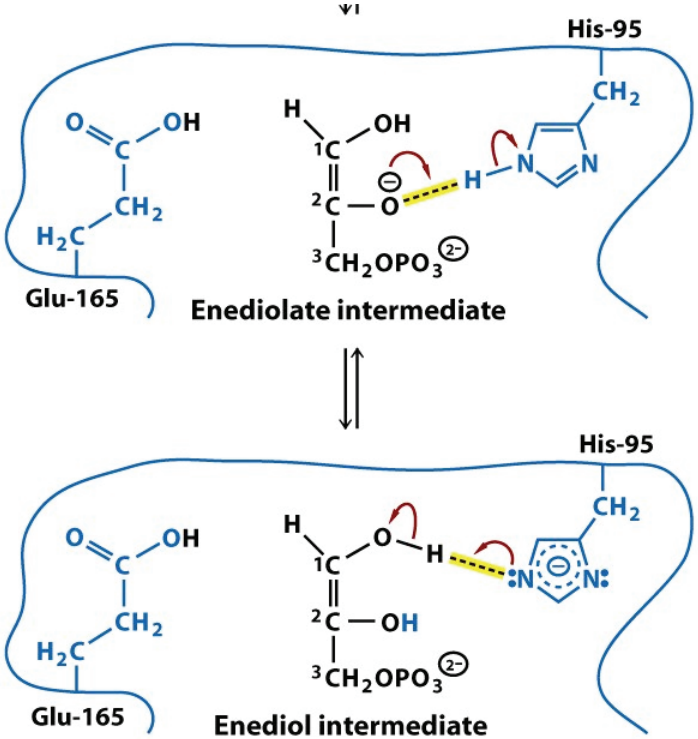
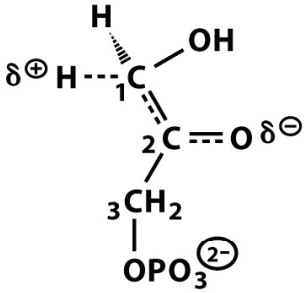
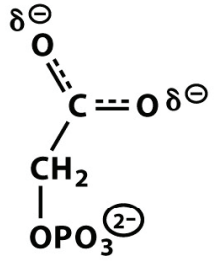


Figure 6-7 part 1 Principles of Biochemistry, 4/e



Transition state



2-Phosphoglycolate (transition-state analog)

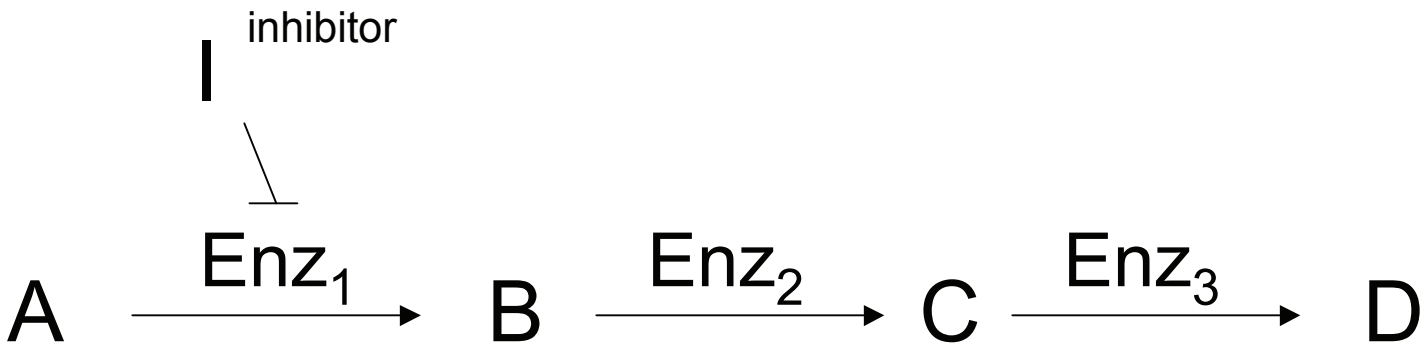
Figure 6-14 Principles of Biochemistry, 4/e

Enzyme Inhibition

- Start with all A, no B, C, or D
- Assume equilibrium of each reaction lies far to the right

- After long time, no A, no B, no C, … all D

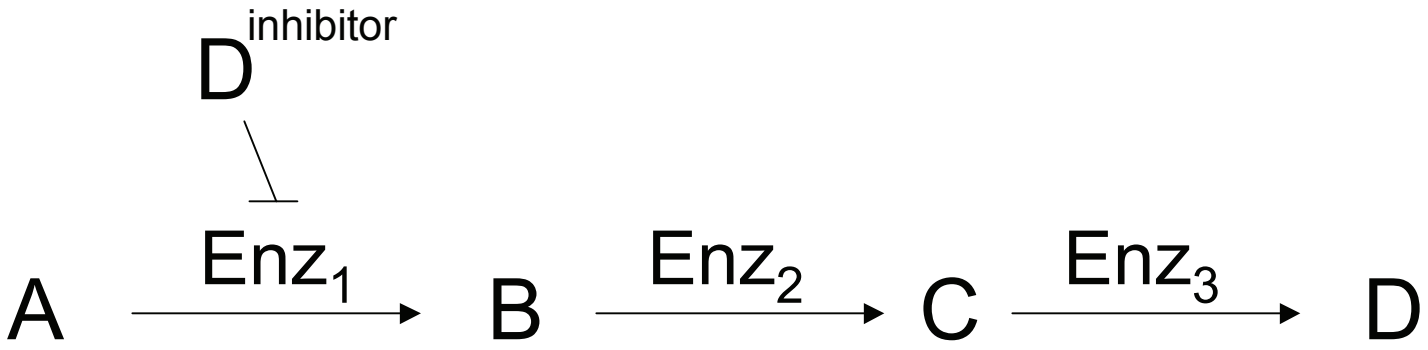
Enzyme Inhibition



- Start with all A, no B, C, or D
- Assume equilibrium of each reaction lies far to the right

- After long time, no reaction. Inhibitor prevents first reaction. Nothing else proceeds.

Enzyme Inhibition



- Start with all A, no B, C, or D
- Assume equilibrium of each reaction lies far to the right

- After long time, WHAT HAPPENS?