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
General Acid-Base Chemistry in Triosephosphate Isomerase

Figure 6-7 part 1 Principles of Biochemistry, 4/e © 2006 Pearson Prentice Hall, Inc.

Figure 6-7 part 2 Principles of Biochemistry, 4/e © 2006 Pearson Prentice Hall, Inc.
General Acid-Base Chemistry in Triosephosphate Isomerase

Dihydroxyacetone phosphate (substrate)

Enediolate intermediate

Transition state

2-Phosphoglycolate (transition-state analog)

Figure 6-7 part 1 Principles of Biochemistry, 4/e © 2006 Pearson Prentice Hall, Inc.

Figure 6-14 Principles of Biochemistry, 4/e © 2006 Pearson Prentice Hall, Inc.
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?