

## Biochemistry Mechanism Assignment

**You must write out the complete, step-by-step mechanisms for chymotrypsin, aspartic protease, and alcohol dehydrogenase. Be sure to draw the arrows showing the direction of electron flow. For chymotrypsin and alcohol dehydrogenase, you must write out the mechanisms as they are in the tutorial. For aspartic protease, use your text.**

In addition, answer the following questions. Your text will be helpful here.

1. Chymotrypsin is a serine protease. What three residues are found in the catalytic triad of all serine proteases? What is the function of each of these amino acids?
2. What is the oxyanion hole in the active site of chymotrypsin? What residues comprise it? What role does it play in catalysis?
3. In the conversion of ethanol to acetaldehyde by alcohol dehydrogenase, is the required form of the coenzyme  $\text{NAD}^+$  or  $\text{NADH}$ ? Briefly explain. Is the conversion of ethanol to acetaldehyde a one-electron or a two-electron transfer?
4. What is the biological function of HIV-1 protease?
5. Which two residues comprise the "catalytic dyad" of aspartic proteases? Describe the catalytic function of these two residues.
6. Explain how protease inhibitors such as Crixivan, Invirase, Norvir and Viracept were developed and how they work.