1. Predict the cutting site of a serine protease that had the following alterations to its S1 pocket
   a. Arginine at bottom
   b. Glutamate at bottom
   c. Tiny pocket with no charge
   d. Large pocket with no charge

2. You discover an unusual protease. At the bottom of its S1 pocket is located a cysteine. When you try to use it to cut any protein, it exhibits no activity. What is the most likely reason?

3. Based on what you’ve learned in class, will a metalloprotease have a fast and a slow step to its catalysis? Why or why not?

4. As described in class, mutation of any of the amino acids in the catalytic triad of a serine protease resulted in a drastic reduction of activity. Predict other amino acid substitutions for catalytic triad amino acids that would have the least effect on the enzyme’s activity.

5. Describe how you might incorporate a catalytic triad into a carbonic anhydrase to engineer a new enzyme that might be more active at a lower pH. How would it work?