

## Activity 43: Factors Affecting Enzyme Activity

### *Learning Objectives*

*Predict changes in an enzyme's activity at a particular pH, temperature, and substrate concentration given its optimal pH and temperature*

*Distinguish competitive and noncompetitive enzyme inhibition*

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**Estimated Completion Time**      45 Minutes

### **Instructor Information**

Introduction to enzyme activity and inhibition

### **ANSWERS TO QUESTIONS**

1. Pepsin. The pH of the stomach is closer to 2 than 7.
2. a. Decrease  
b. Decrease  
c. Initially, it may increase, but under steady state conditions it will stay the same.
3. Scenario (a)
4. Scenario (b)
5. Competitive. It has a very similar structure to the substrate, and the polarity of the two molecules are the same.
6. Noncompetitive
7. Competitive. Since there is competition for the active site, the molecule present in larger numbers will have more probability of getting into the active site.

8. Noncompetitive. This inhibitor effectively removes some of the enzyme from the catalysis pool.
9. This type of inhibitor permanently inactivates the enzyme, or “kills” it.

#### **Activity 43: Skill Development**

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1.
  - a. Initially, the rate may decrease, but under steady state conditions it will stay the same.
  - b. The rate decreases.
  - c. The rate decreases.