**Enzyme Function**

**6.1: What Is an Enzyme?**

* **Describe how enzymes differ from other catalysts.**

increasing chemical reaction rates

classic serine proteases

substrate specificity

**6.2: Chemical Catalytic Mechanisms**

* **Describe the chemical mechanisms enzymes use to accelerate reactions**

activation energy

reaction spontaneity

reaction rates

acid/base catalysis

covalent catalysis

metal ion catalysis

**Chymotrypsin: serine protease mechanism**

catalytic triad

catalytic steps/mechanisms

order of products released

transition/covalent intermediates

stabilization of transition state

**6.3: Unique Properties of Enzyme Catalysts**

* **Explain how active site structure contributes to catalysis**

transition state stabilization

induced fit

proximity and orientation

**6.4: Chymotrypsin in Context**

* **Recognize that chymotrypsin illustrates general features of enzyme evolution and physiology**

divergent evolution (Chymotrypsin/Trypsin/Elastase)

conservation of catalytic mechanism/triad

specificity pockets

convergent evolution (Subtilisin)

zymogens/activation by cleavage

protease inhibitors

**6.5: Clinical Connection: Blood Coagulation**

* **Describe blood coagulation as a protease cascade**

fibrin/blood clotting

thrombin/coagulation cascade

antithrombin