Skills to Develop

• identify the types of catalysis used in enzyme-catalyzed reactions given a detailed mechanism;
• interpret kinetic experiments experiments varying substrate, inhibitors, pH, ion strength, and amino acid side chains (through chemical modification or site-specific mutagenesis) to better understand the catalytic mechanisms utilized in enzyme-catalyzed reactions;
• identify potential rate limiting steps in enzyme catalyzed reaction mechanisms and simplify kinetic equations based on them;
• generally describe the diversity, the critical active site residues and the biological activities of proteases;
• describe the structure/function of the proteasome.

We can apply what we learned about catalysis by small molecules to enzyme-catalyzed reactions. To understand the mechanism of an enzyme-catalyzed reaction, we try to alter as many variables, one at a time, and ascertain the effects of the changes on the activity of the enzyme. Kinetic methods can be used to obtain data from which inferences about the mechanism can be made. Obviously, crystal structures of the enzyme in the presence and absence of a competitive inhibitor give abundant information about possible mechanisms.

• Topic hierarchy

Contributors

• Prof. Henry Jakubowski (College of St. Benedict/St. John's University)