



ENZYMOLGY

Presented by Dr. A.H.Mahdavi

Enzymes Inhibitions

- **Reversible**
 - **Competitive**
 - **Noncompetitive**
 - **Uncompetitive**

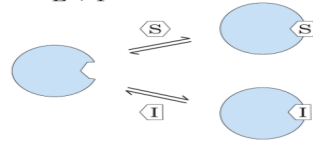
- **Irreversible**

Reversible Inhibition

(a) Competitive inhibition



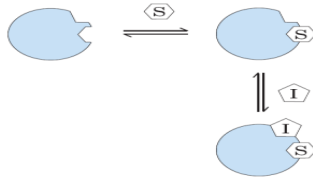
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(b) Uncompetitive inhibition



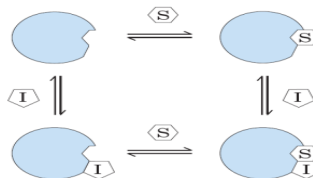
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(c) Mixed inhibition

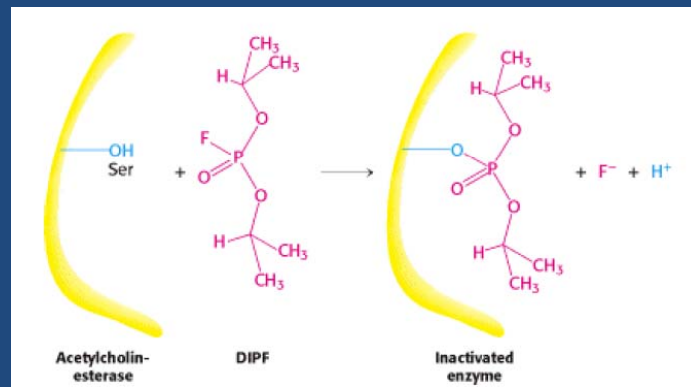


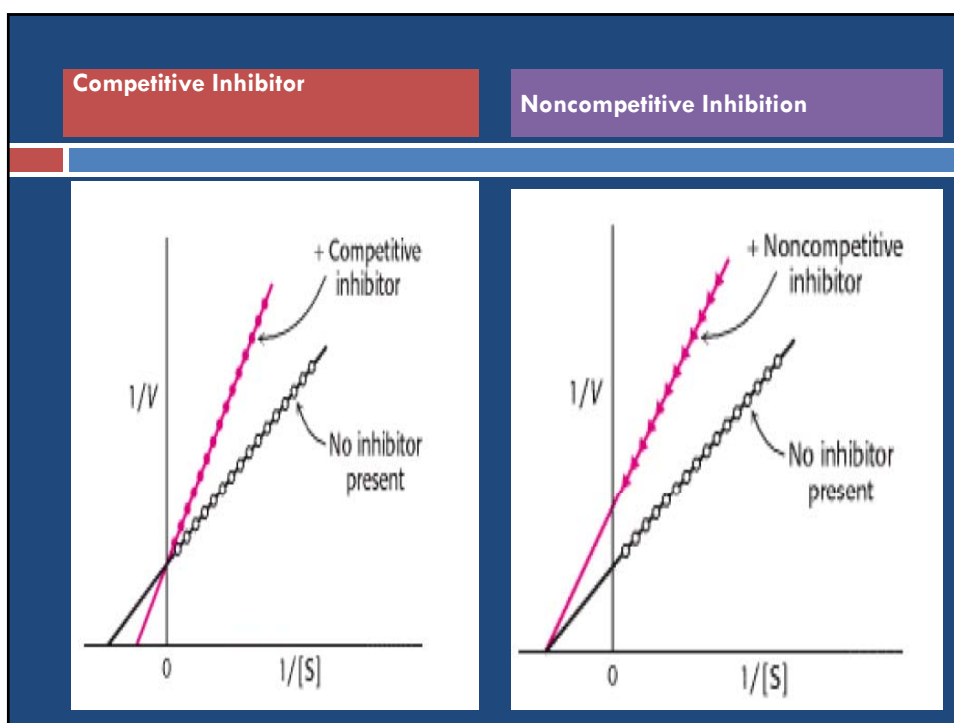
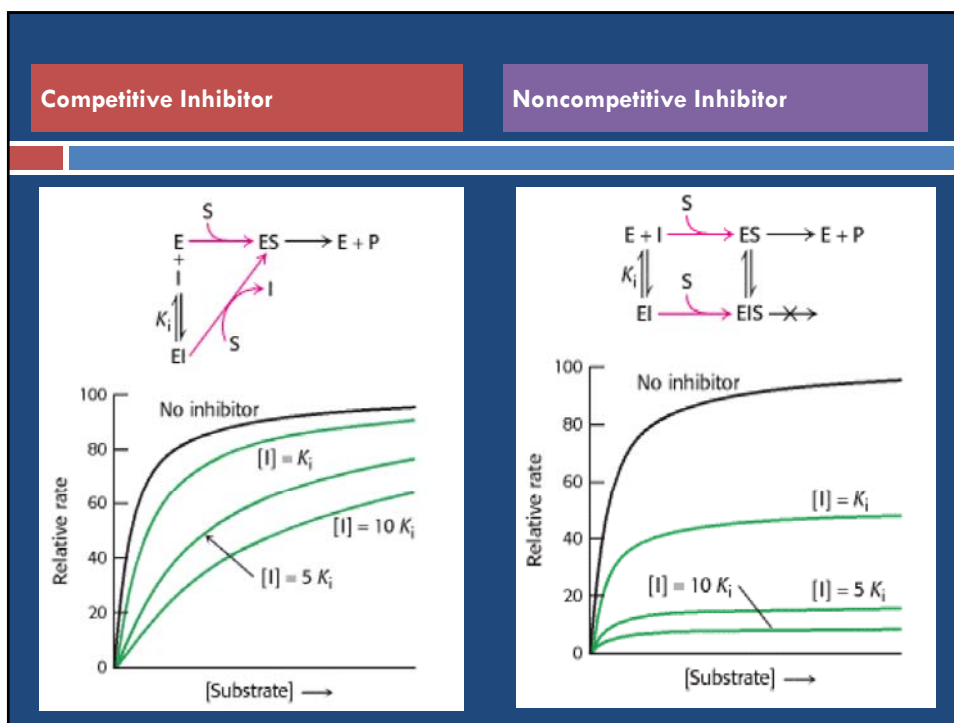
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Irreversible Inhibition

- Suicide
- Inactivators
 - Diisopropylphosphofluoridate (DIPF)





Regulatory Enzymes

- **Allosteric Enzymes**
 - allosteric modulators or allosteric effectors
- Often the modulator is the substrate itself; regulatory enzymes for which substrate and modulator are identical are called **homotropic**.
- When the modulator is a molecule other than the substrate, the enzyme is said to be **heterotropic**.
- Note that allosteric modulators should not be confused with uncompetitive and mixed inhibitors. Although the latter bind at a second site on the enzyme, they do not necessarily mediate conformational changes between active and inactive forms, and the kinetic effects are distinct.

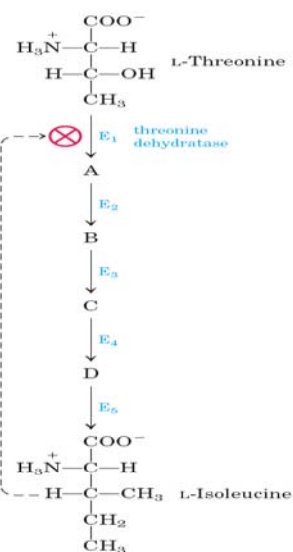
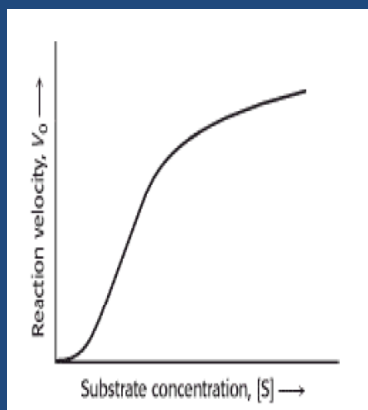


FIGURE 6-28 Feedback inhibition. The conversion of L-threonine to L-isoleucine is catalyzed by a sequence of five enzymes (E_1 to E_5). Threonine dehydratase (E_1) is specifically inhibited allosterically by L-isoleucine, the end product of the sequence, but not by any of the four intermediates (A to D). Feedback inhibition is indicated by the dashed feedback line and the \otimes symbol at the threonine dehydratase reaction arrow, a device used throughout this book.

Proteolytic Cleavage of an Enzyme Precursor

- Zymogen
- Proproteins or proenzymes

Covalent Modification

- covalent modification of a specific functional group necessary for activity.
- The phosphorylation of specific amino acid residues is a particularly common way to regulate enzyme activity.