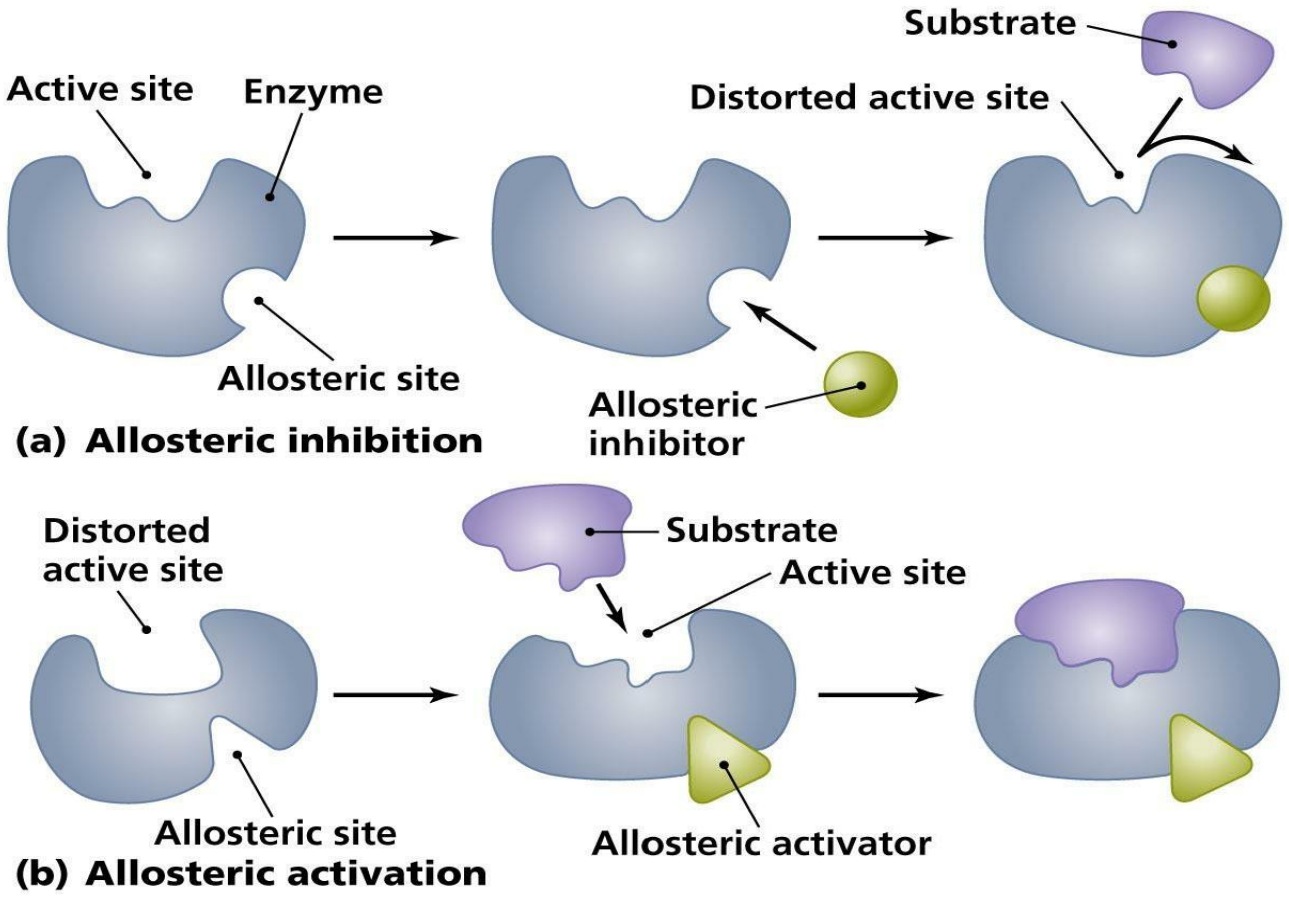
ENZYMES

- DEFINITION : Enzymes are protenecious biocatalyst (except ribozyme)which work by lowering the activation energy and remain unchanged after reaction.

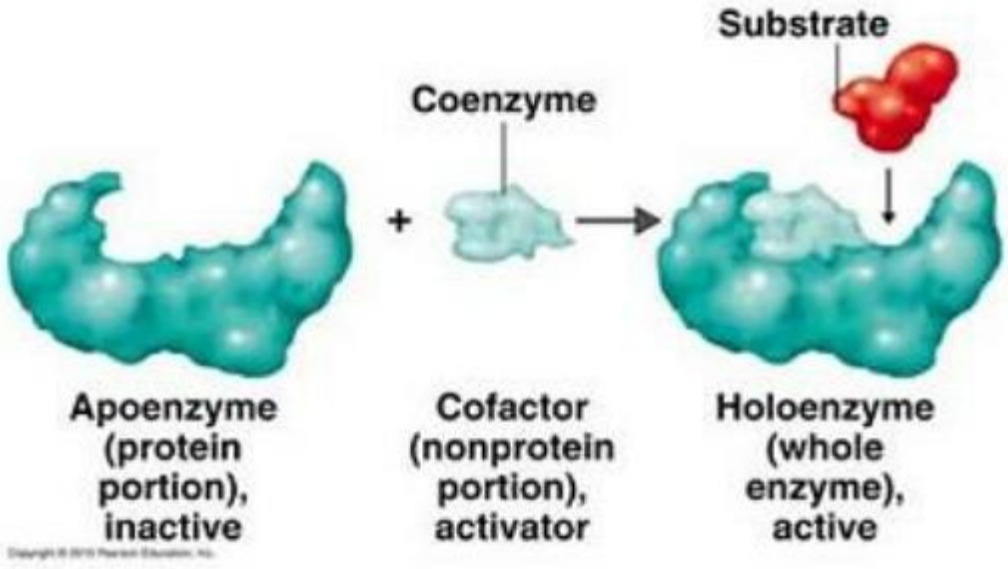
- PROPERTIES OF ENZYME :
- Enzymes are protein in nature except ribozymes
- Enzymes are highly specific .They are specialized protein and have high degree of specificity for their substrate.
- Enzyme exhibit enormous catalytic power. It increases the rate of a reaction by lowering the activation energy

ENZYME STRUCTURE



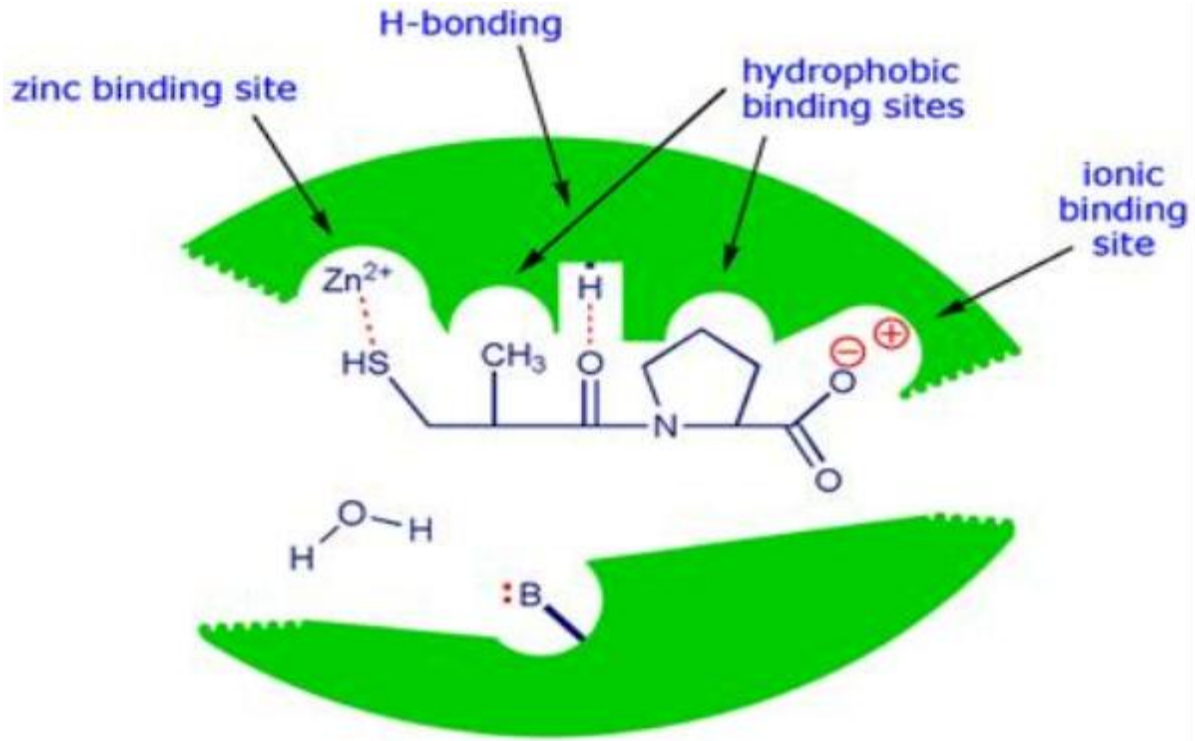
TERMS

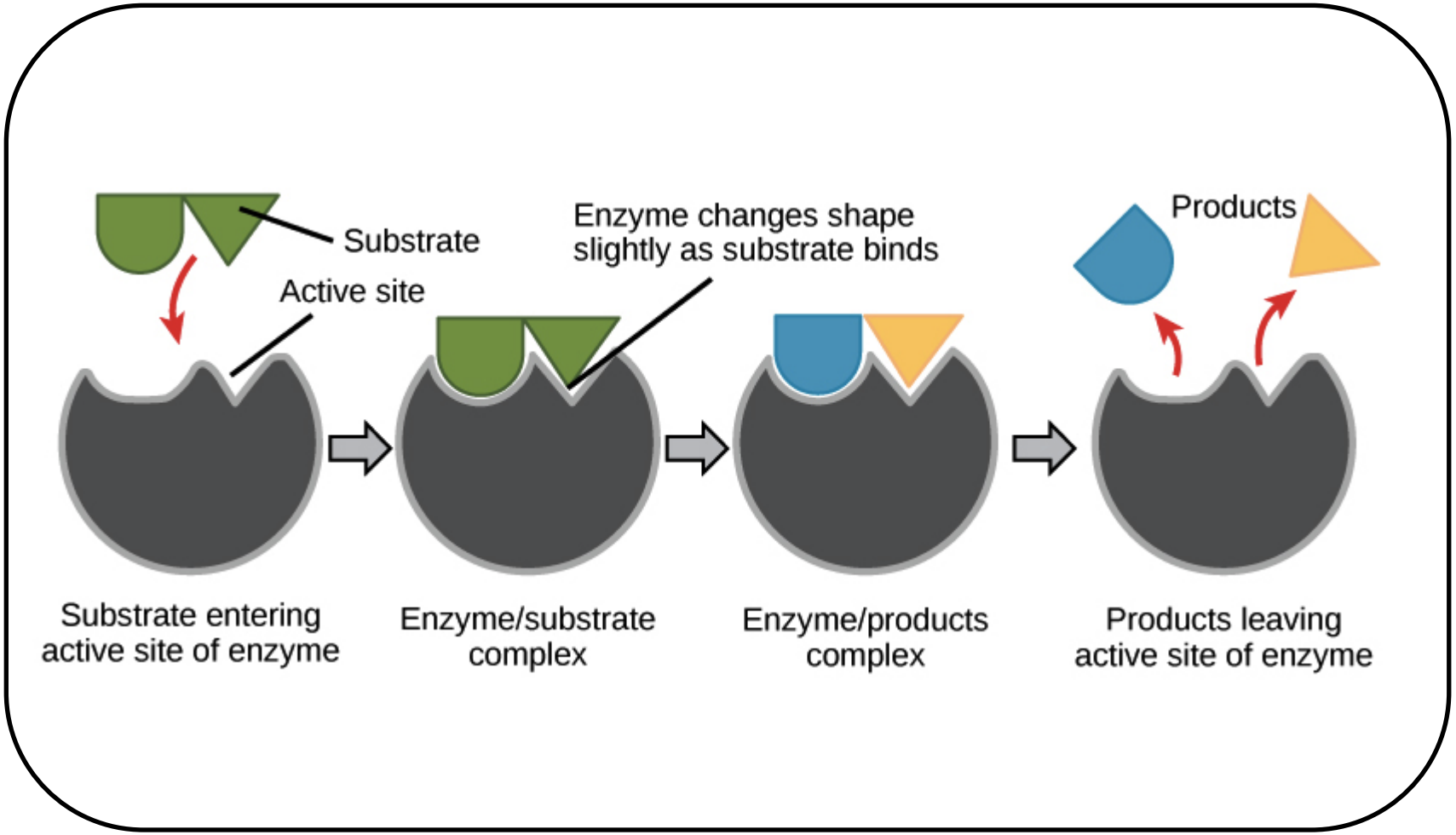
- APOENZYME
- COFACTOR,
- HOLOENZYME
- PROSTHETIC GROUP



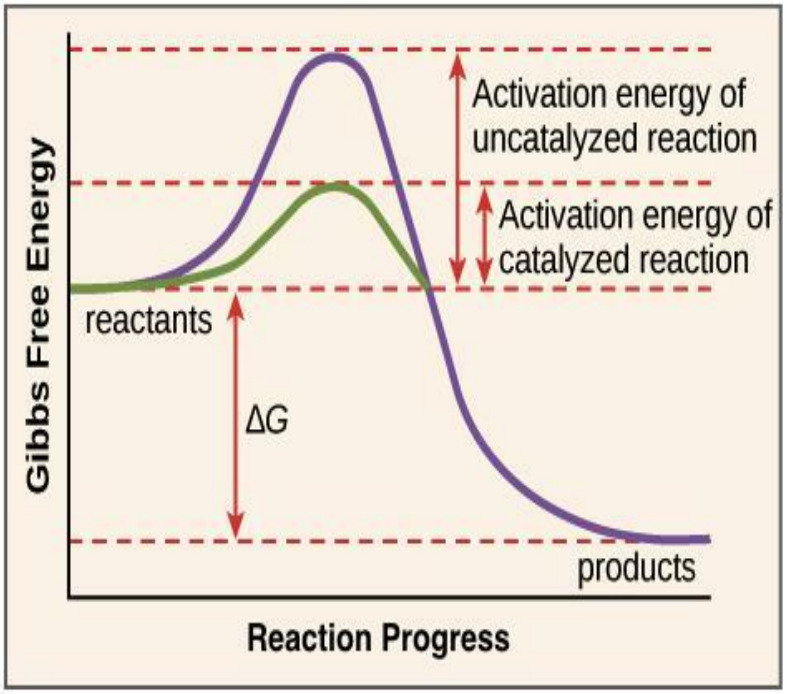
- The binding energy released due to the interaction between enzyme and substrate lowers the activation energy.
- Only the correct substrate can form maximum interactions with the enzyme and thus maximized binding energy .
- Furthermore, the full complement of such interactions is formed only when the enzyme facilitates the formation of transition state.
- Transition state is the point of highest free energy.

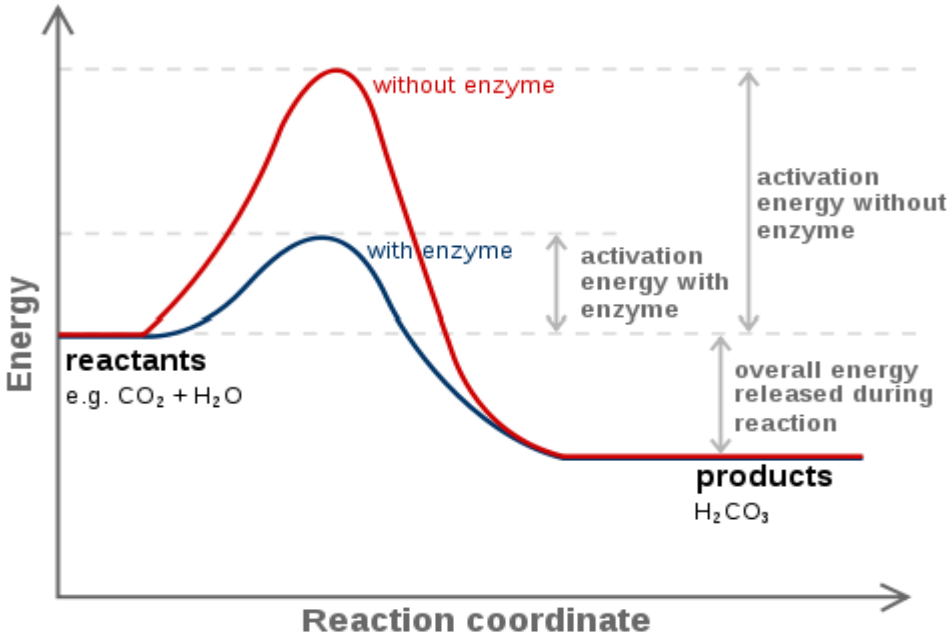
Different bonds at the active site of an enzyme with substrate




Substrate
Active site
Enzyme changes shape slightly as substrate binds
Products
Substrate entering active site of enzyme
Enzyme/substrate complex
Enzyme/products complex
Products leaving active site of enzyme

HOW enzyme work?

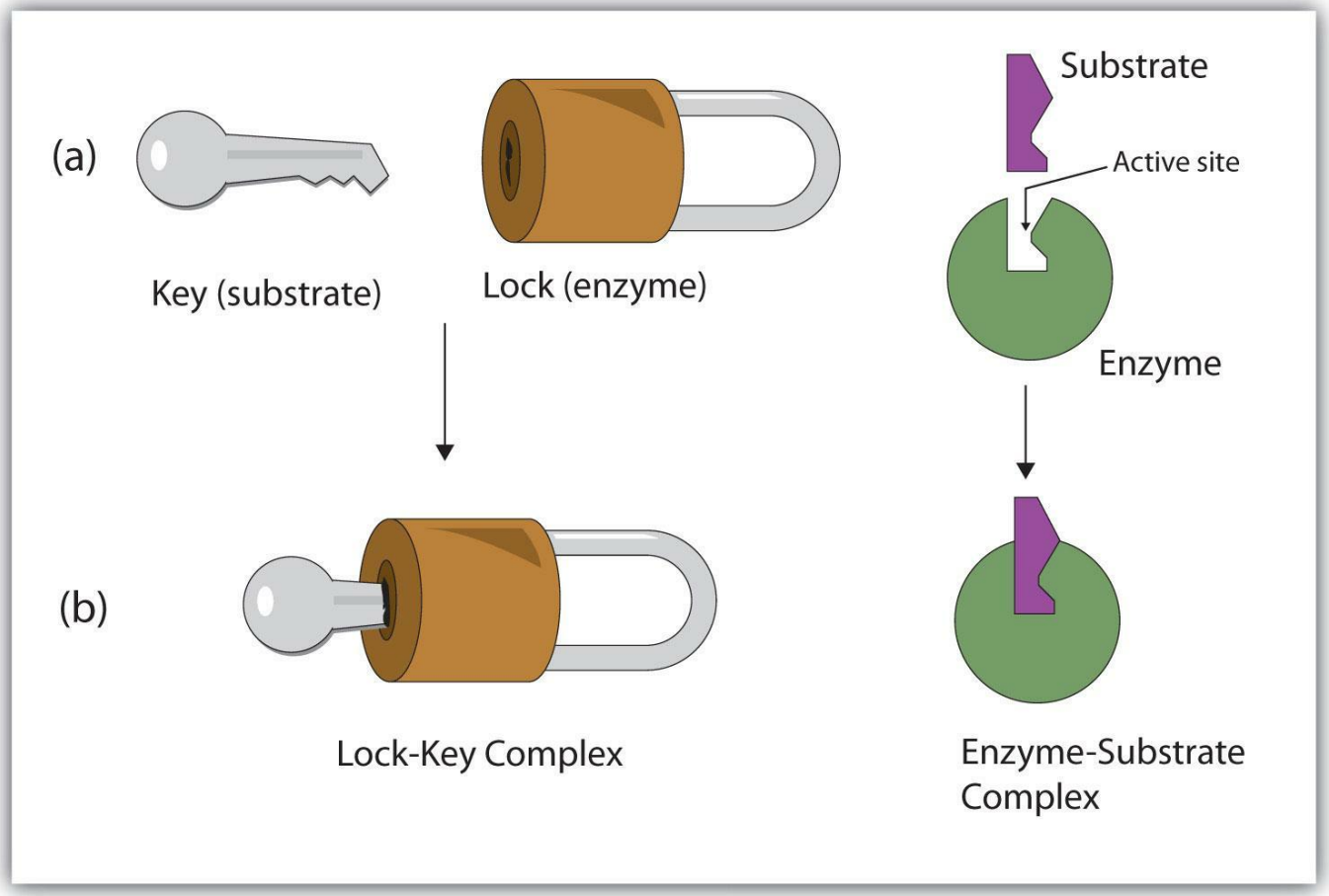




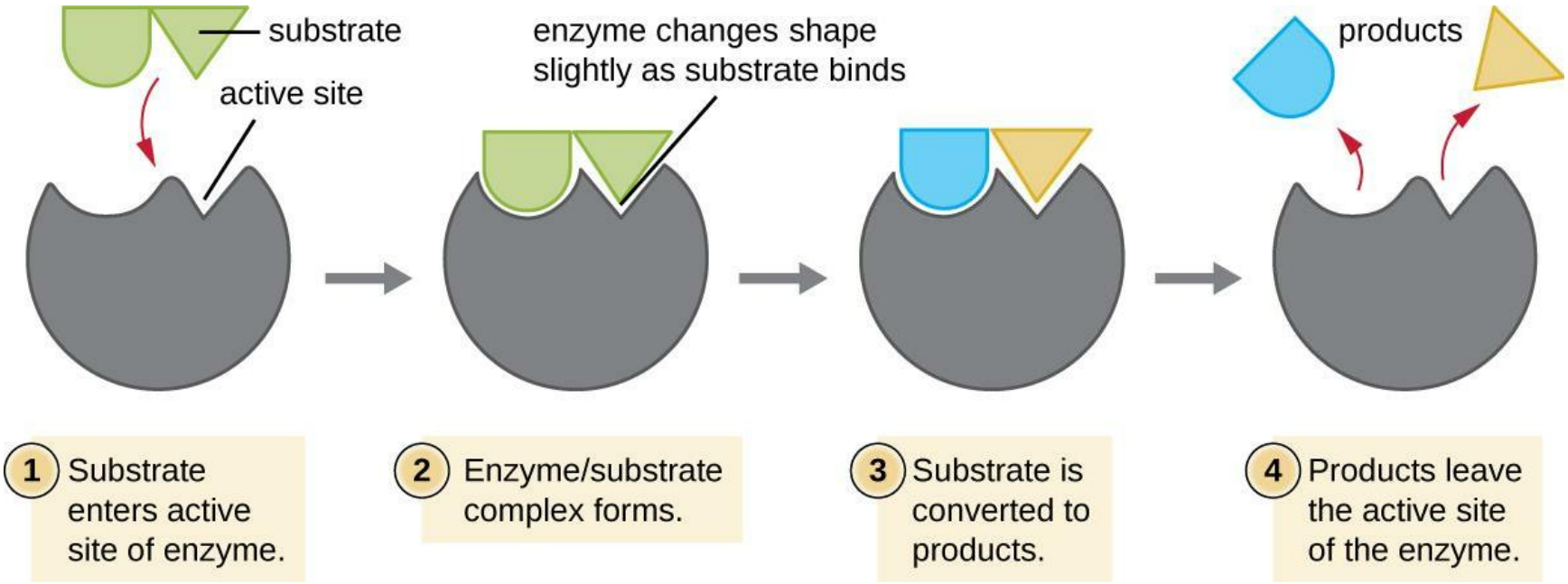
An enzyme accelerates the rate of a chemical reaction several times as compared to uncatalyzed reaction in water.

It increases the rate of a chemical reaction by lowering the activation energy.

model of enzyme action



INDUCED FIT MODEL



ENZYME KINETICS

- Enzyme inhibition : a. competetive
- b. Non competetive
- C. uncompetetive.

$$\mathrm{E} + \mathrm{S} \underset{k_1}{\overset{k_{-1}}{\rightleftharpoons}} \mathrm{ES} \xrightarrow{k_2} \mathrm{E} + \mathrm{P}$$

Determination of vmx ,km

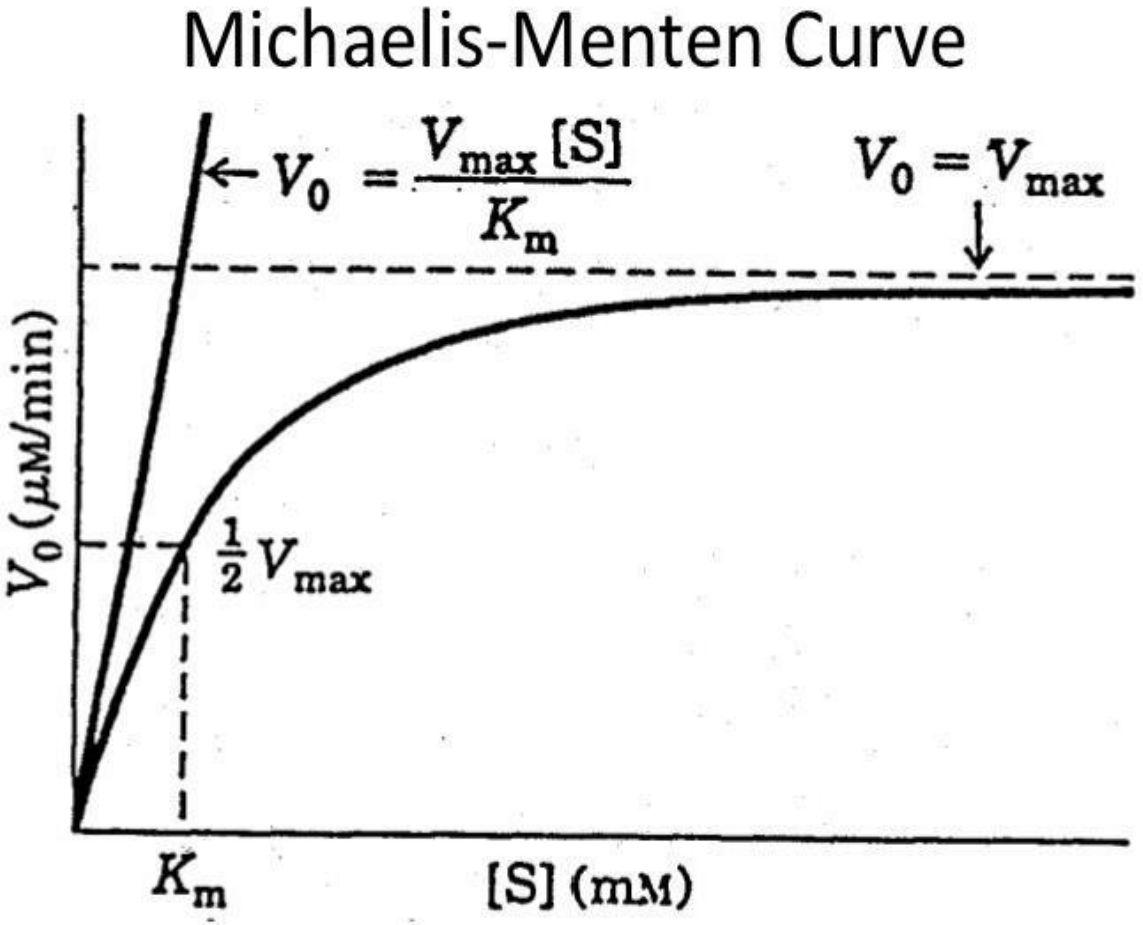


Diagram of the inhibition