



**SNS COLLEGE OF ALLIED HEALTH SCIENCES**

SNS Kalvi Nagar, Coimbatore - 35

Affiliated to Dr MGR Medical University, Chennai



**DEPARTMENT OF OPERATION THEATRE AND  
ANAESTHESIA TECHNOLOGY**

**COURSE NAME : BIOCHEMISTRY**

**TOPIC : ENZYMES - FACTORS AFFECTING ENZYME ACTIVITY**



# Factors affecting enzyme activity



Temperature

Hydrogen ion concentration (pH)

Substrate concentration

Enzyme concentration

Products of the reaction

Presence of activator/inhibitor

Cofactors & Coenzymes

Allosteric effects

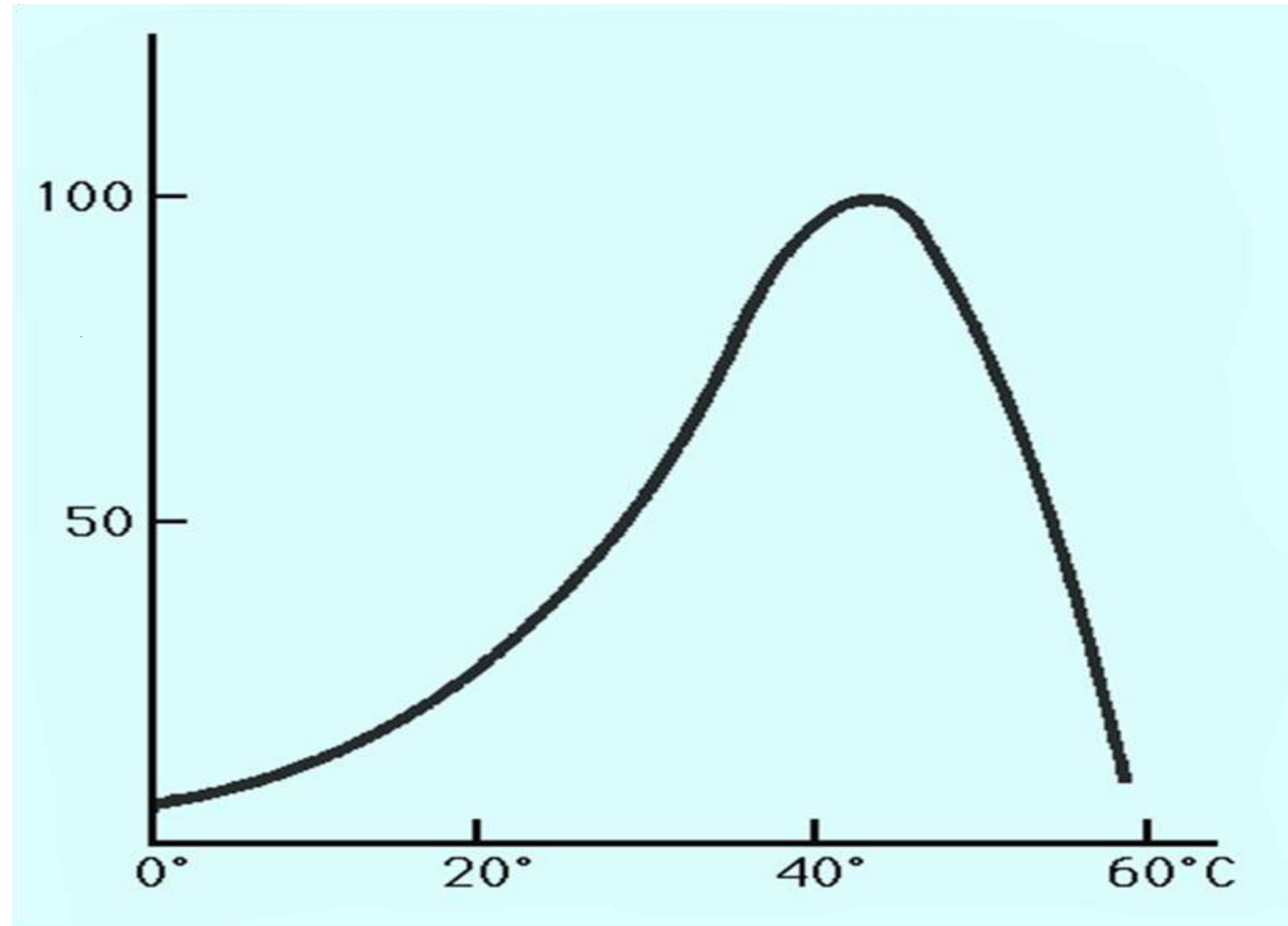
Time



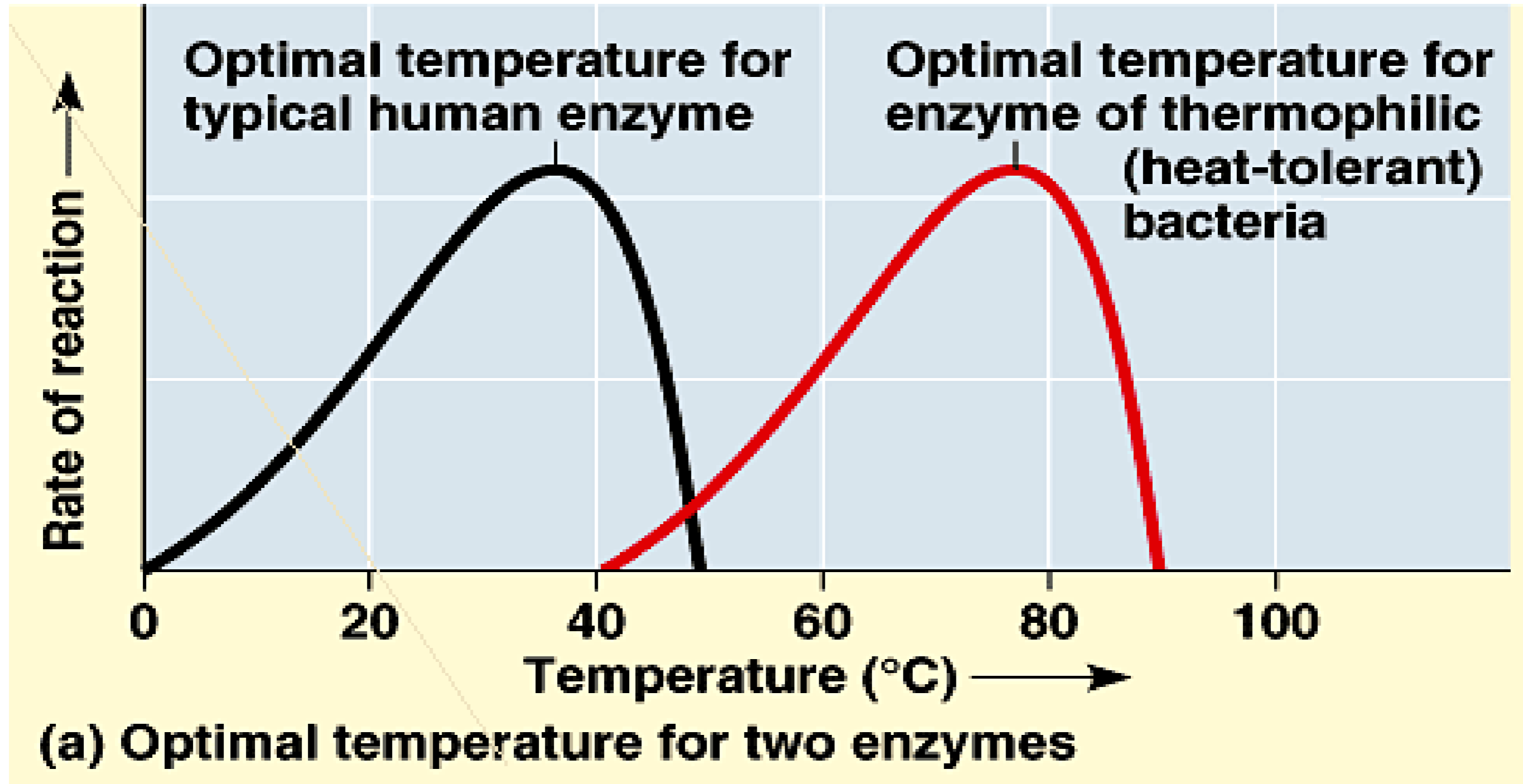
# Effect of Temperature



**Reaction  
Velocity ( $v_o$ )**



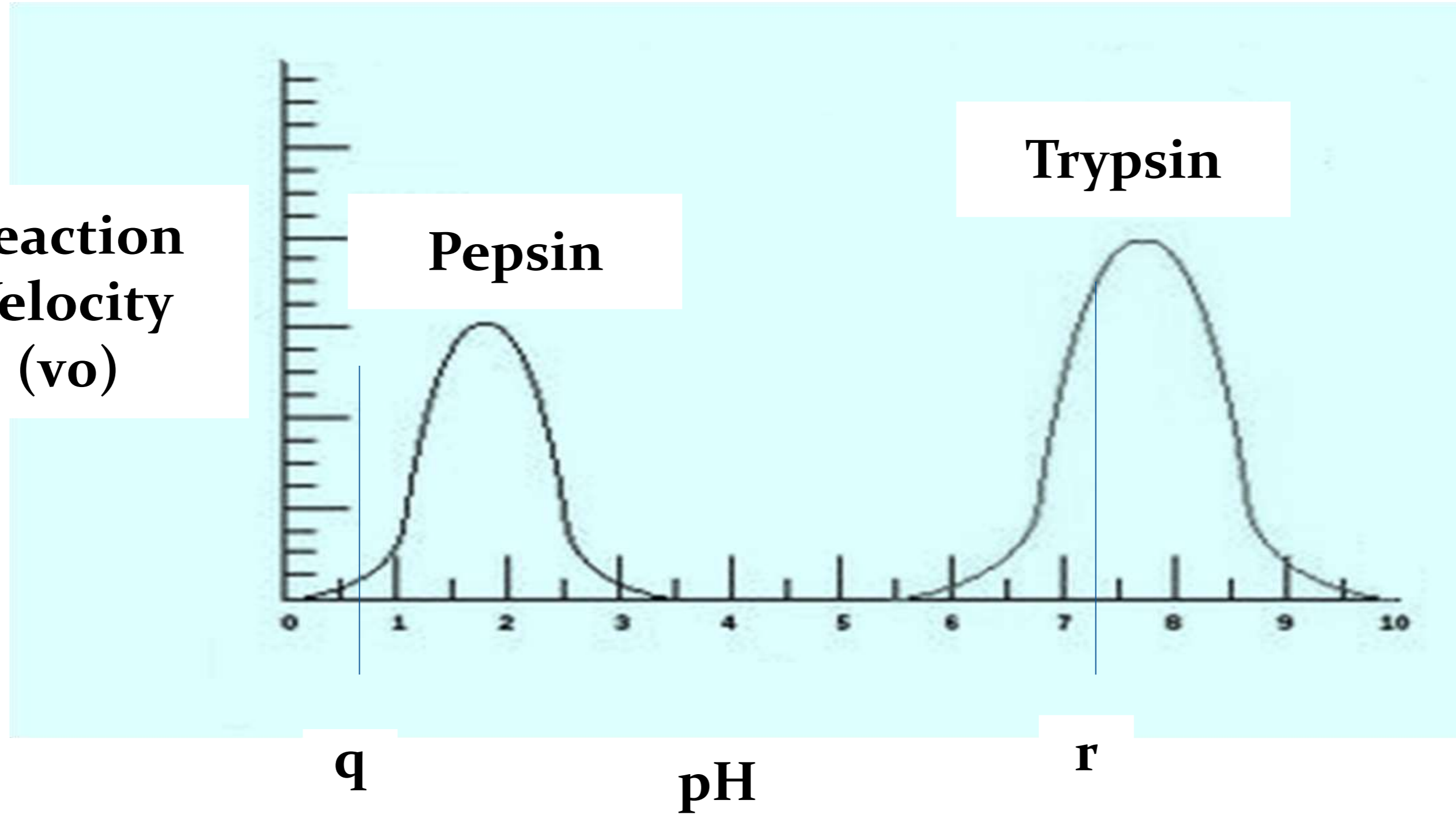
**Temperature(°C)**

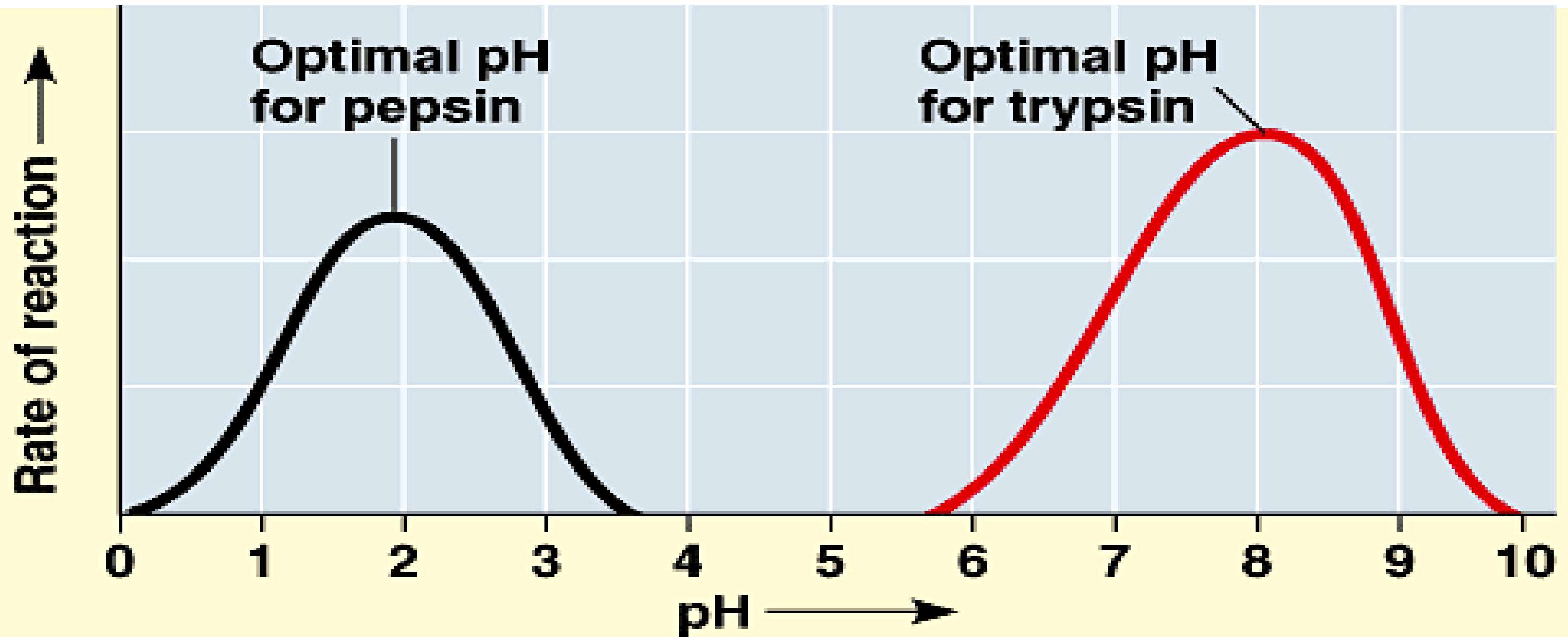




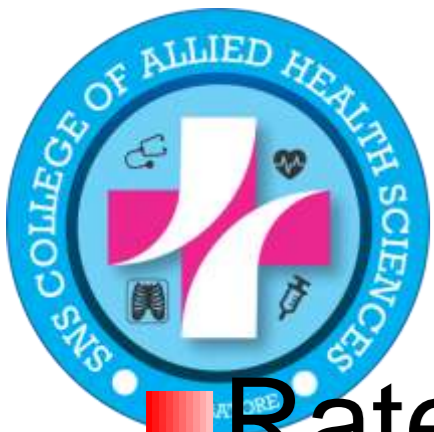
# Effect of pH

Reaction  
Velocity  
(vo)

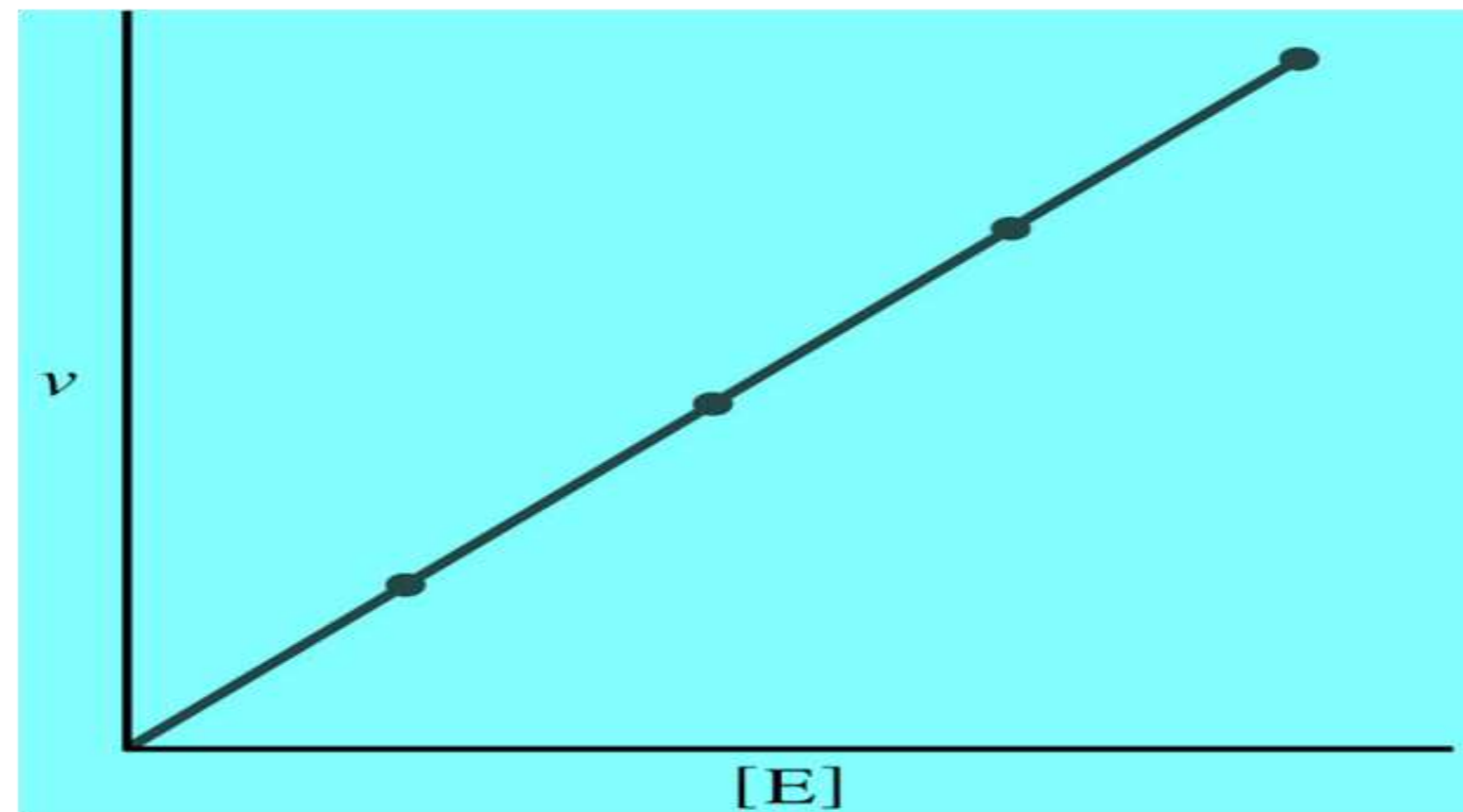




**(b) Optimal pH for two enzymes**



■ Rate of the reaction or velocity is directly proportional to the Enzyme Concentration when sufficient substrate is present.

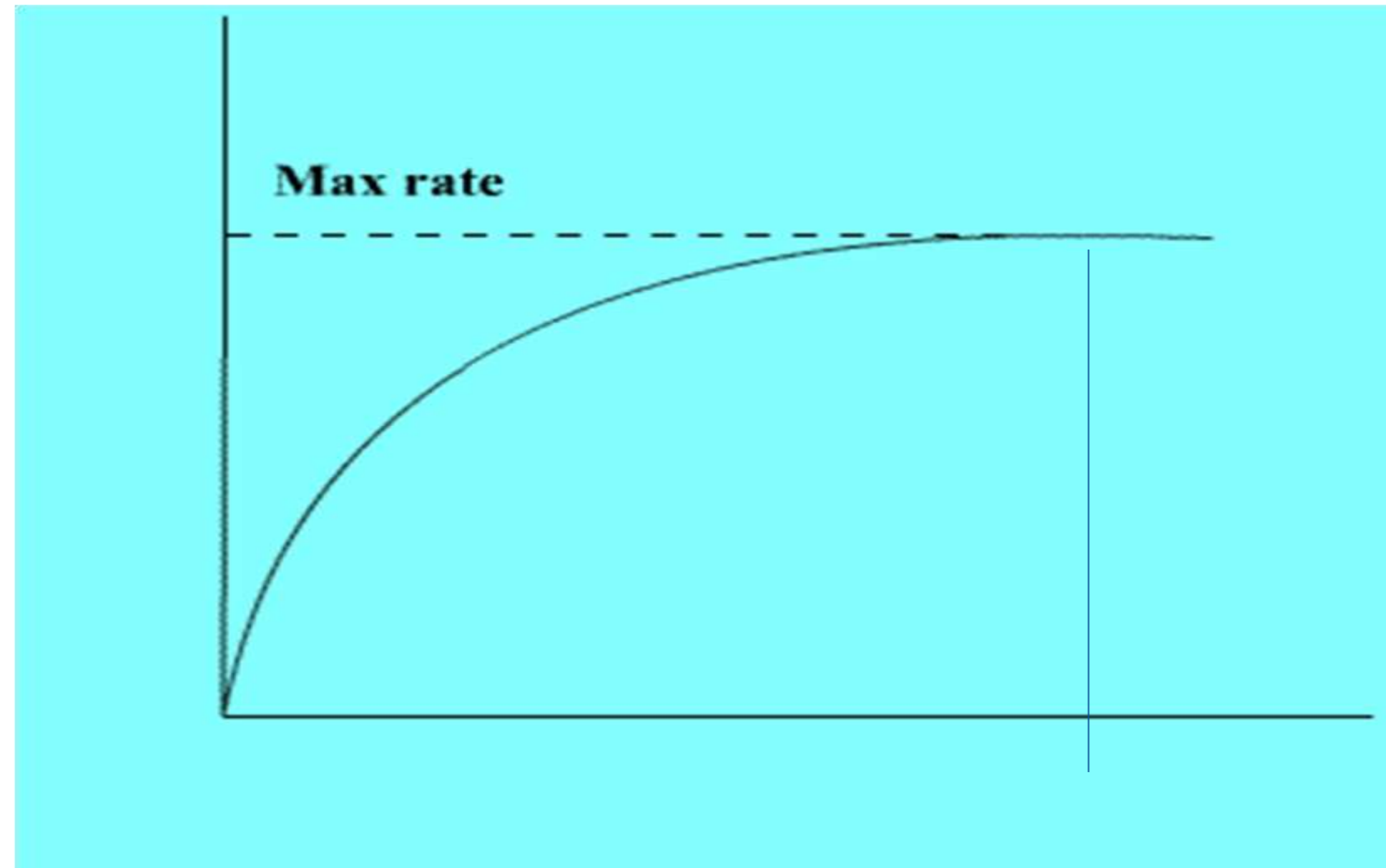


■ Accumulation of Product in a reaction causes inhibition of enzyme activity.



# Effect of Substrate Concentration

**Reaction  
Velocity  
( $v_o$ )**

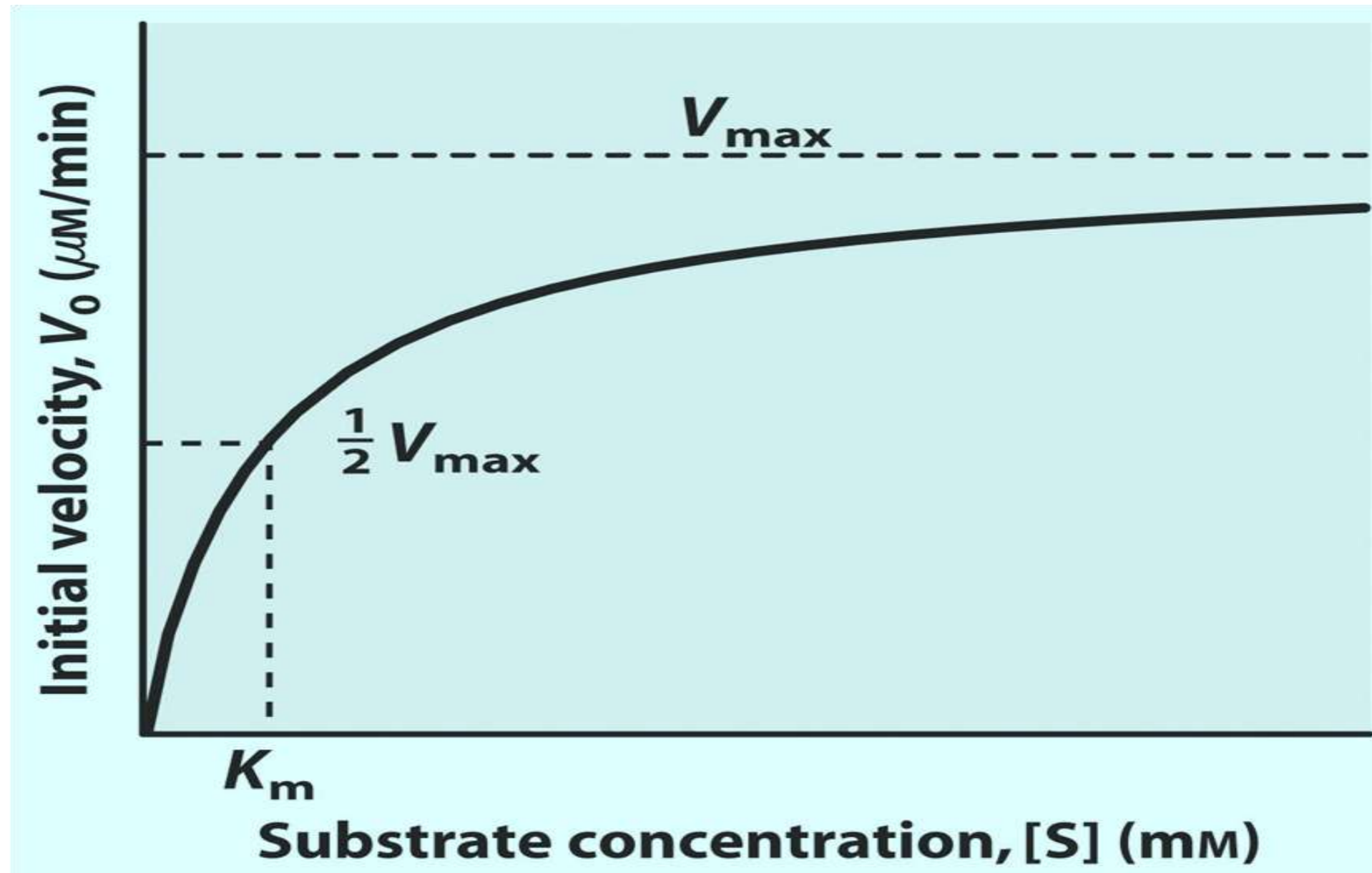


**Substrate Concentration/arbitrary Units**



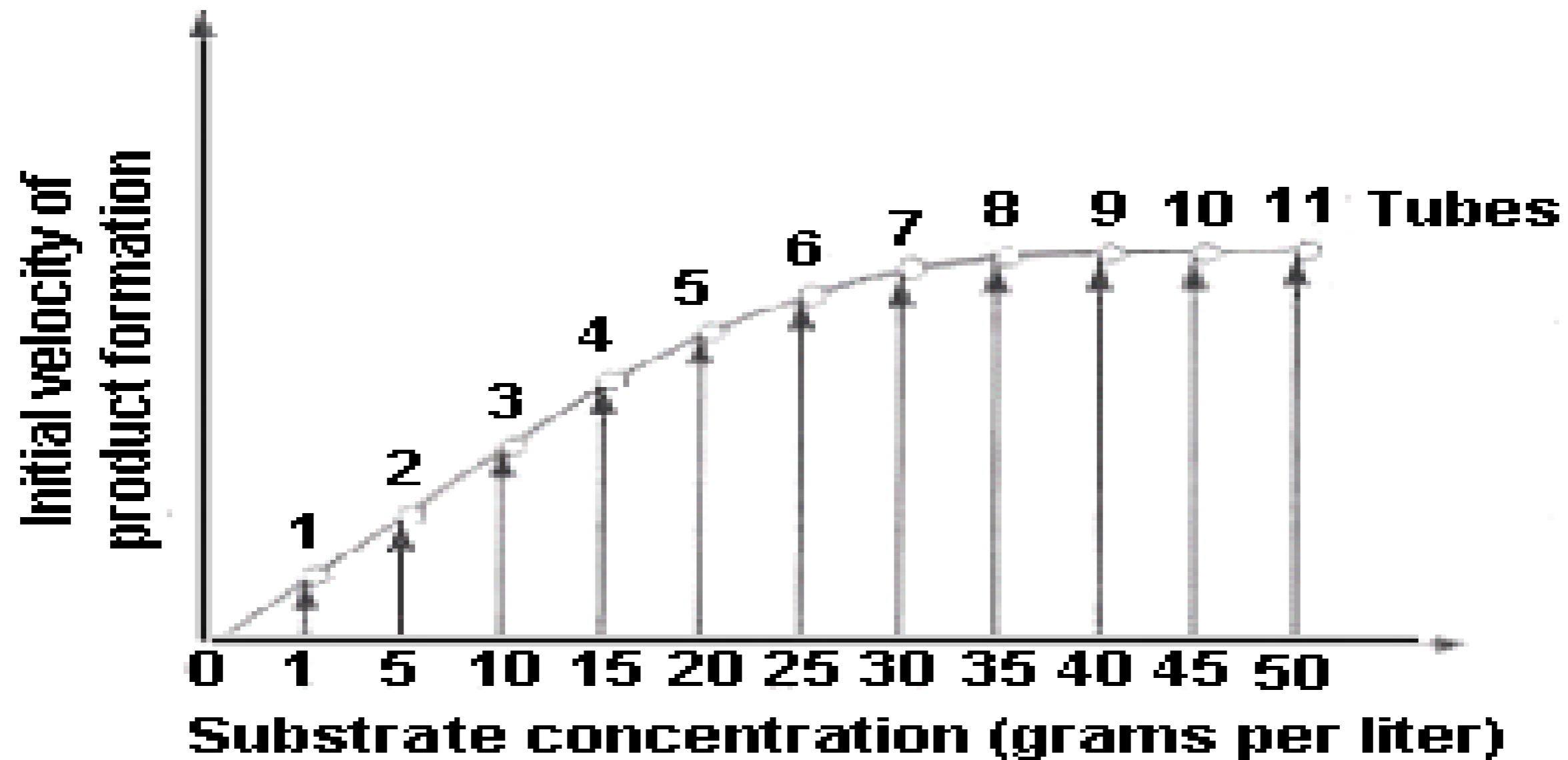


# Effect of Substrate Concentration on Reaction Velocity





# Effect of Increasing Substrate Concentration



**Fixed amount of enzyme, but increasing amounts of substrate carried out in eleven test tubes**



## Mechanism of enzyme action

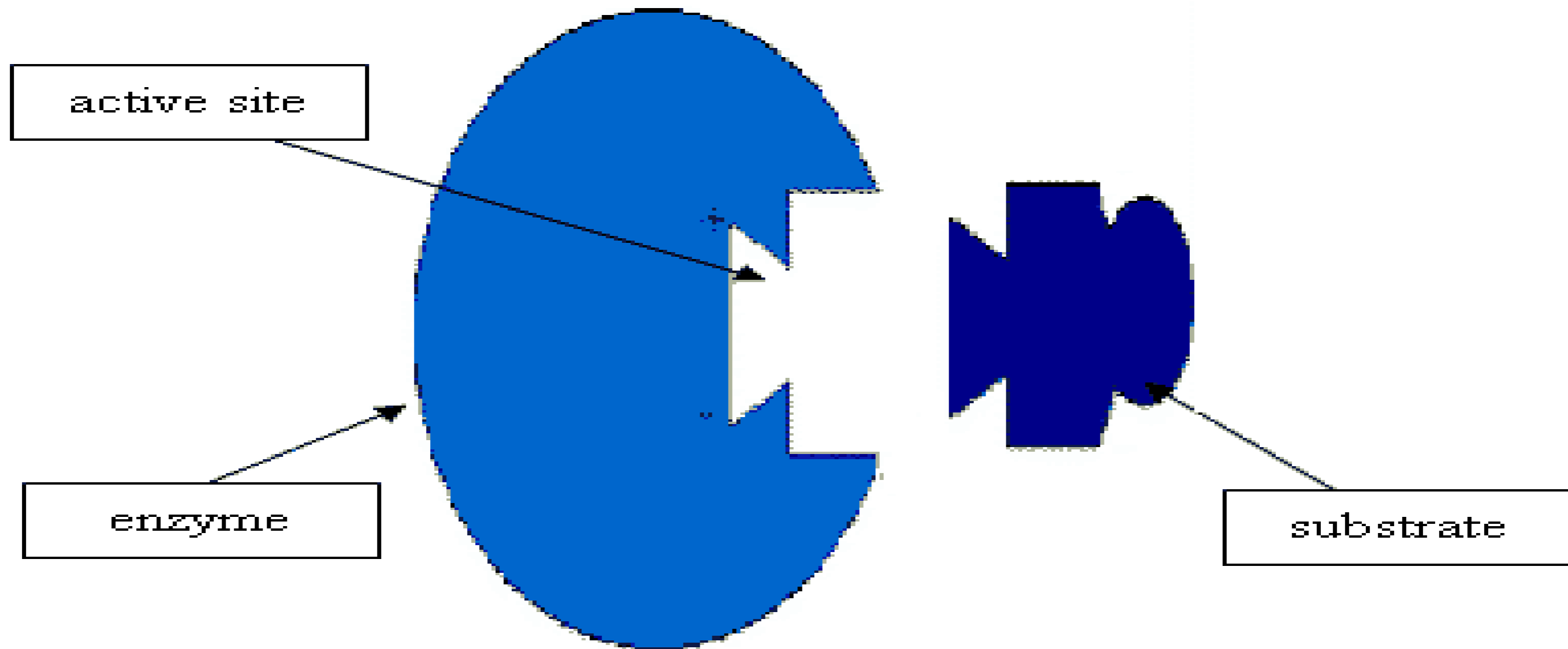
The enzymatic reactions takes place by binding of the substrate with the active site of the enzyme molecule by several weak bonds.



Formation of ES complex is the first step in the enzyme catalyzed reaction then ES complex is subsequently converted to product and free enzyme.

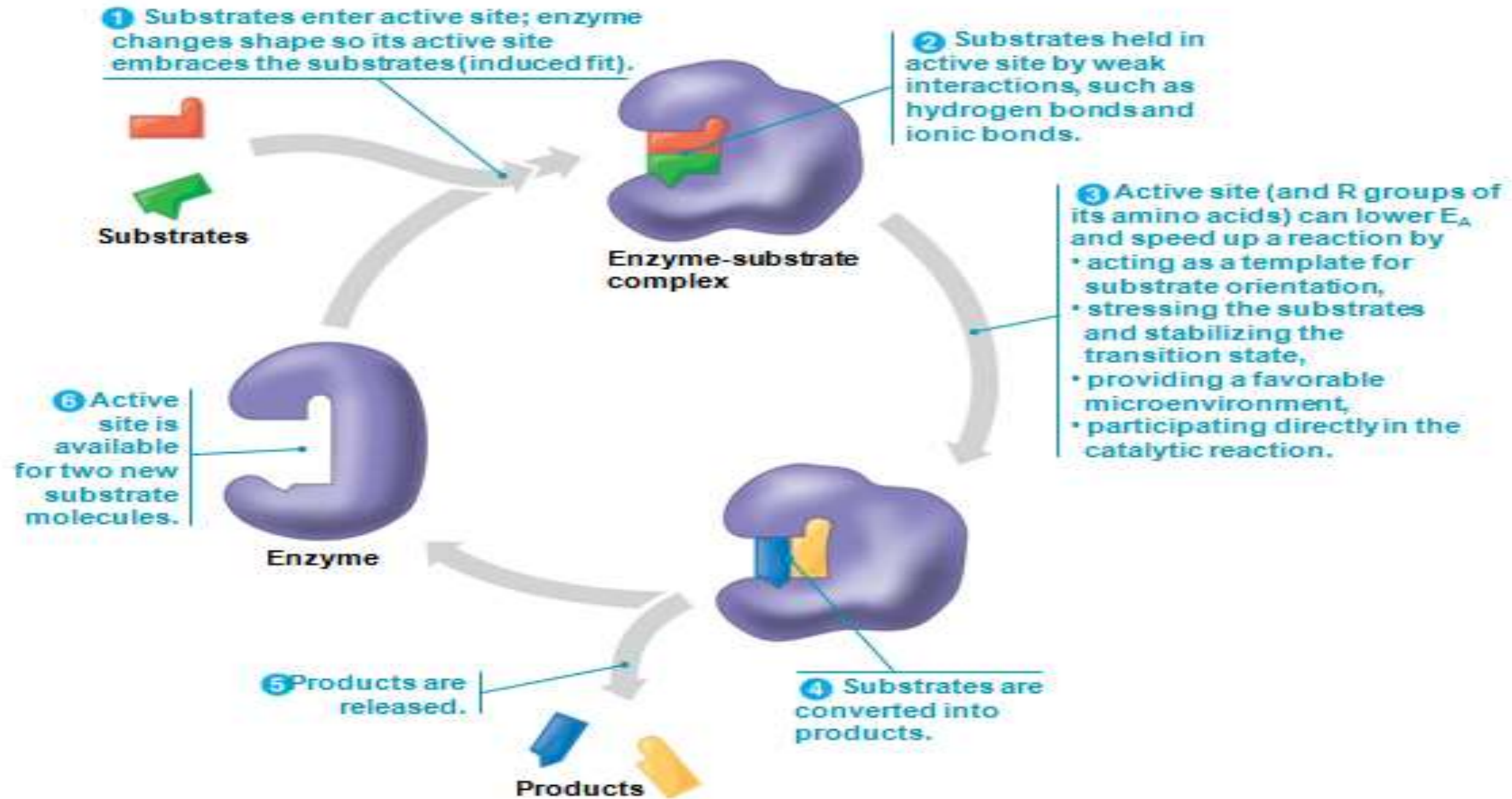


# "Lock and key" or Template model





# Induced-fit model





# Assessment



1. List out the factor affecting on enzyme activity?
2. How does the pH affects the rate of enzyme activity?
3. How does the temperature affects the rate of enzyme activity?
4. Two mechanism of enzyme action?
5. What is Lock and Key model?
6. What is Induced fit model?



**THANK YOU**