SNS COLLEGE OF PHARMACY AND HEALTH SCIENCES

Affiliated To The Tamil Nadu Dr. MGR Medical University, Chennai
Approved by Pharmacy Council of India, New Delhi. Coimbatore -641035

COURSE NAME : MEDICINAL BIOCHEMISTRY
YEAR : PHARM D /I YEAR
TOPIC : Factors affecting enzyme activity

Design Thinking in COENZYME

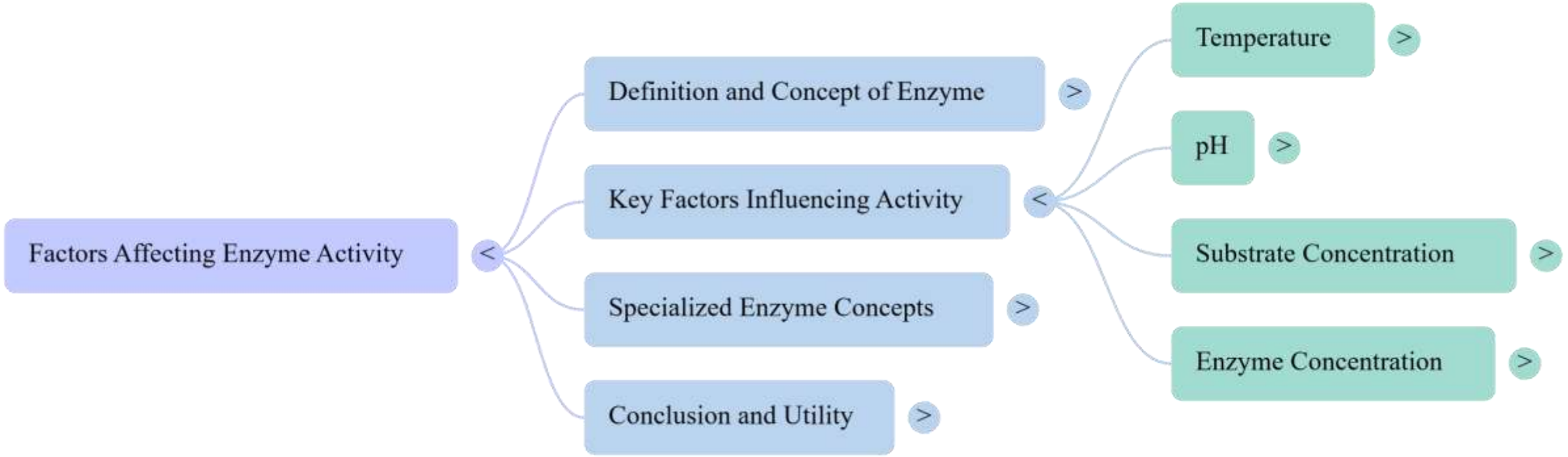
1.Empathize: Deeply understand the student's or learner's challenges, needs, and experiences. This involves engaging with students, educators, and biologists to uncover pain points, preferences, and unmet needs in understanding microscopic cell processes.

2.Define: Reframe the problem based on insights from the empathize phase and establish clear context. This involves synthesizing data to pinpoint the core issue, such as defining the need for clearer explanations of cellular mechanisms.

3.Ideate: Brainstorm and explore a wide range of ideas and potential explanations, including innovative diagrams or models.

4.Prototype: Simulate and build educational tools or visuals to enhance comprehension.

MINDMAP


Factors Affecting Enzyme Activity
Definition and Concept of Enzyme
Key Factors Influencing Activity
Specialized Enzyme Concepts
Conclusion and Utility
Temperature
pH
Substrate Concentration
Enzyme Concentration

Choose the appropriate inhibitor type to control enzyme activity.

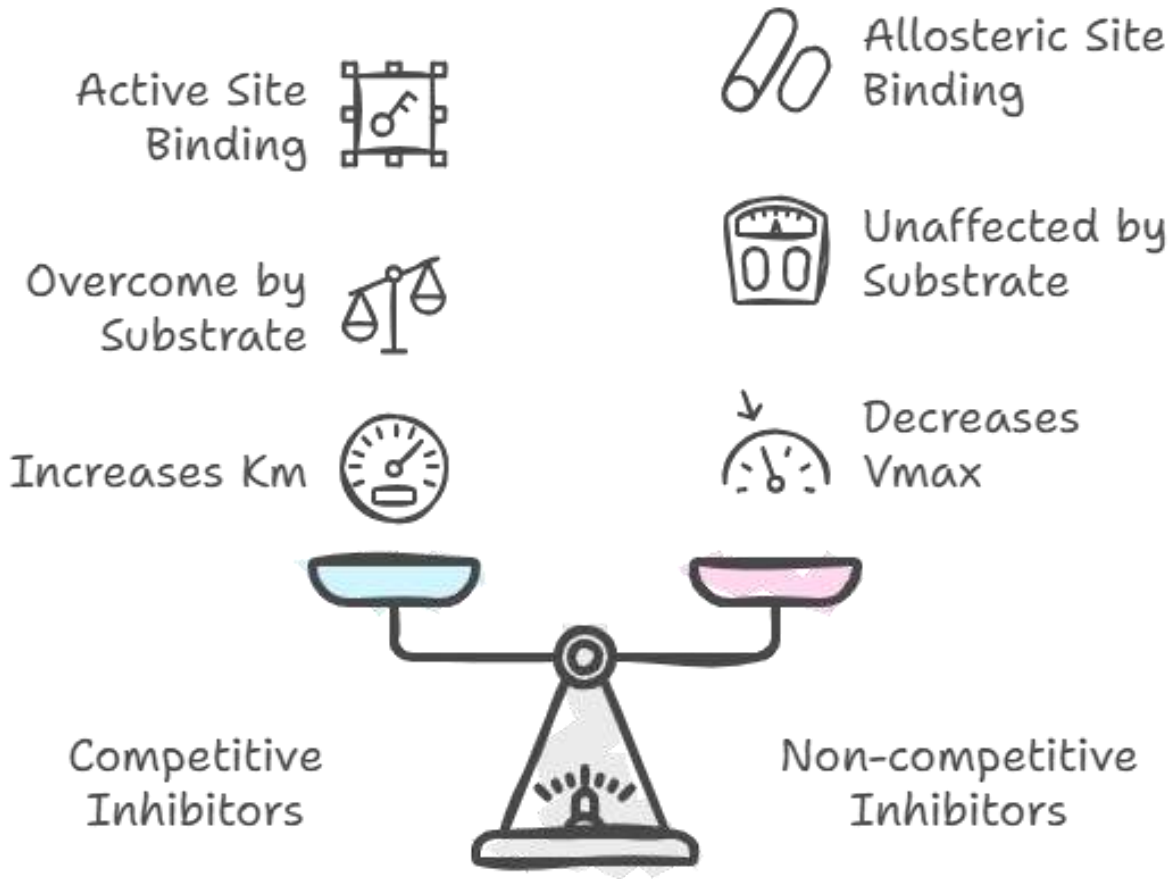
Competitive Inhibitors

Increase Km, no effect on Vmax

Non-competitive Inhibitors

Decrease Vmax, no effect on Km

Compare enzyme inhibitor mechanisms.



Understanding Enzyme Inhibitors

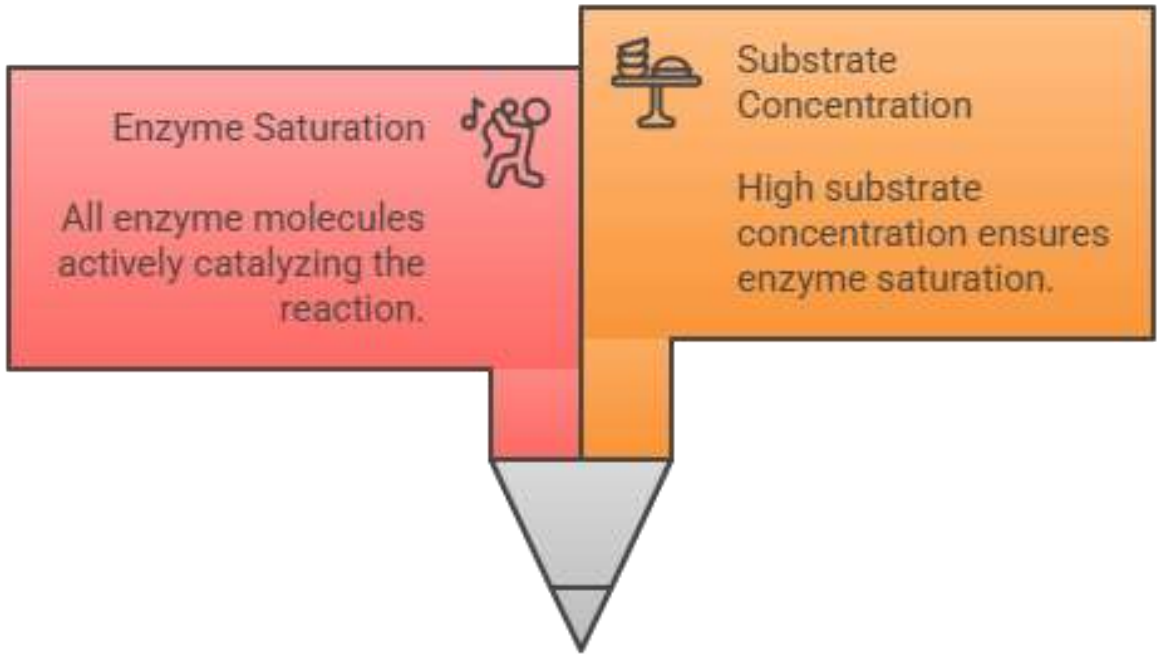
Competitive Inhibitors

Bind to the active site, competing with the substrate

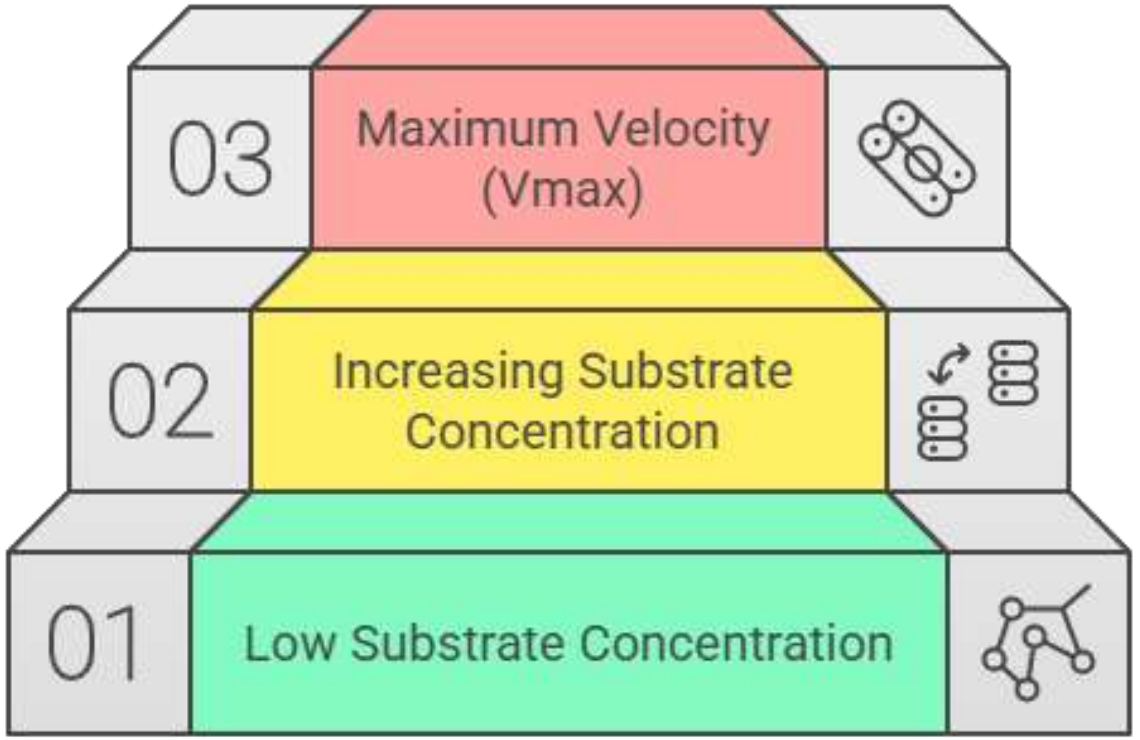
Non-competitive Inhibitors

Bind to an allosteric site, changing enzyme conformation

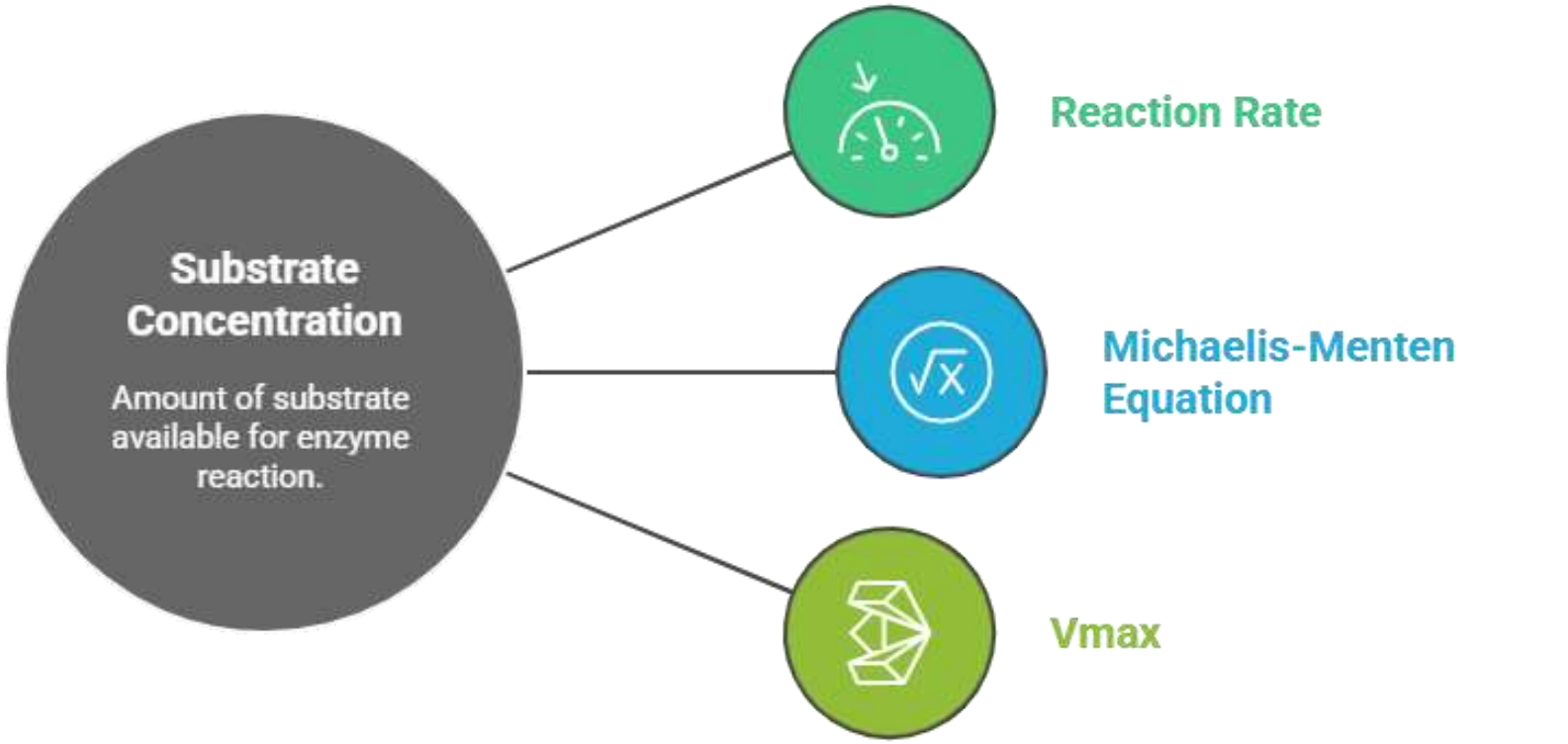
Achieving Vmax in Enzyme Kinetics



Achieving Maximum Enzyme Velocity



Unveiling the Impact of Substrate Concentration on Reaction Rate



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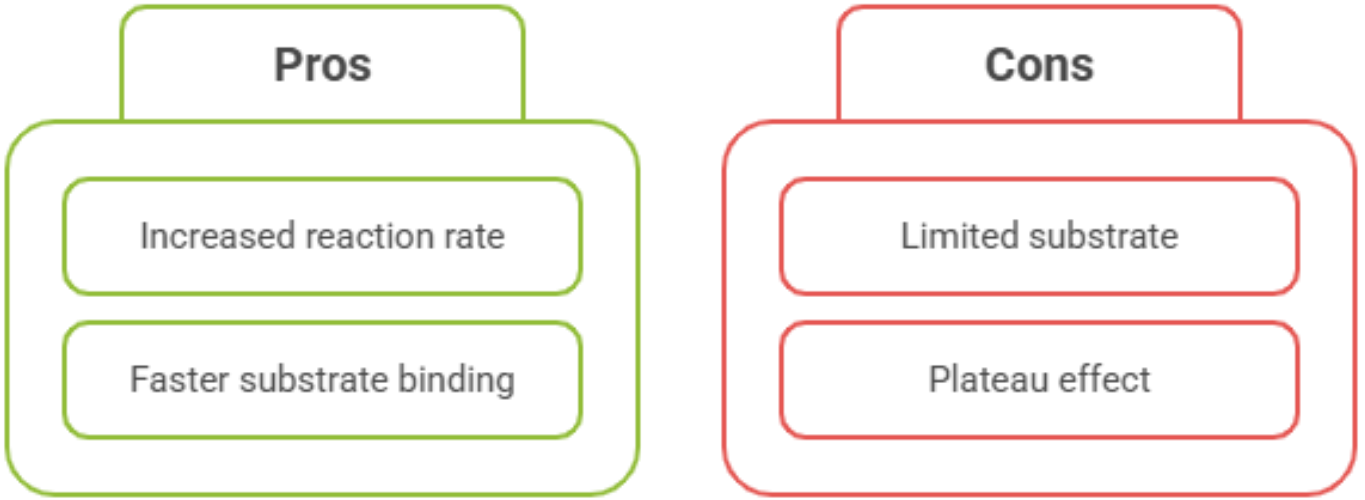
Enzyme concentration increase



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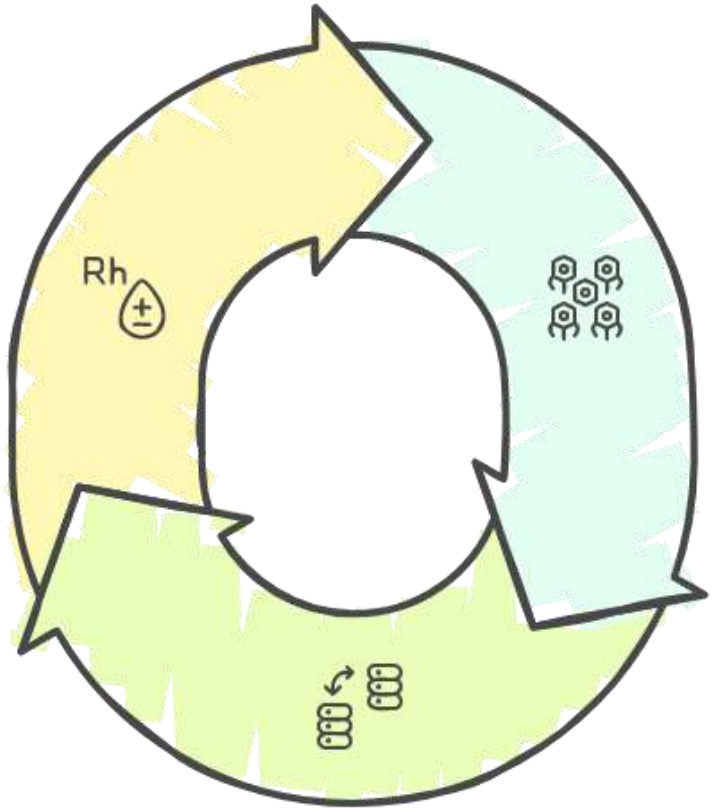
Enzyme-Substrate Interaction Cycle



Reaction Rate Doubles

Reaction rate increases proportionally.

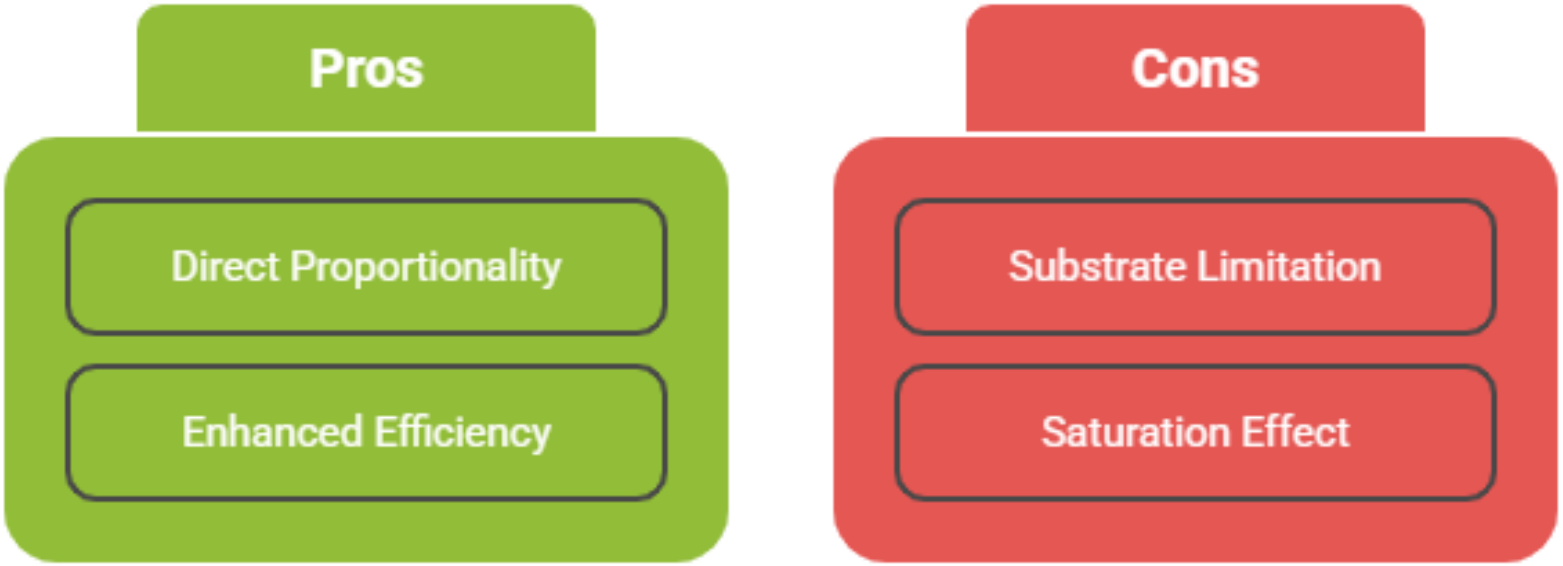
Excess Substrate

Substrate is abundant, not limiting.

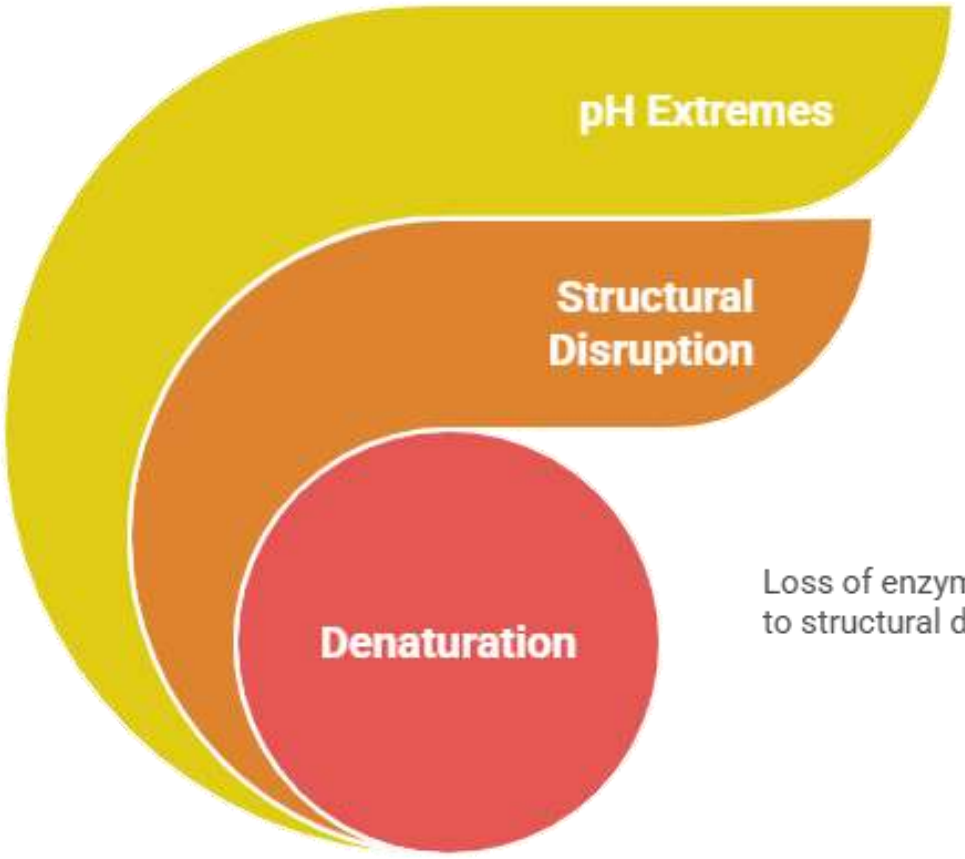
Enzyme Concentration Increase

Enzyme concentration is doubled.

Enzyme Concentration



Enzyme Denaturation by pH Extremes



Conditions causing denaturation

Breakdown of bonds maintaining enzyme shape

Loss of enzyme activity due to structural damage

Enzyme Activity and pH

Reaction Catalyzed

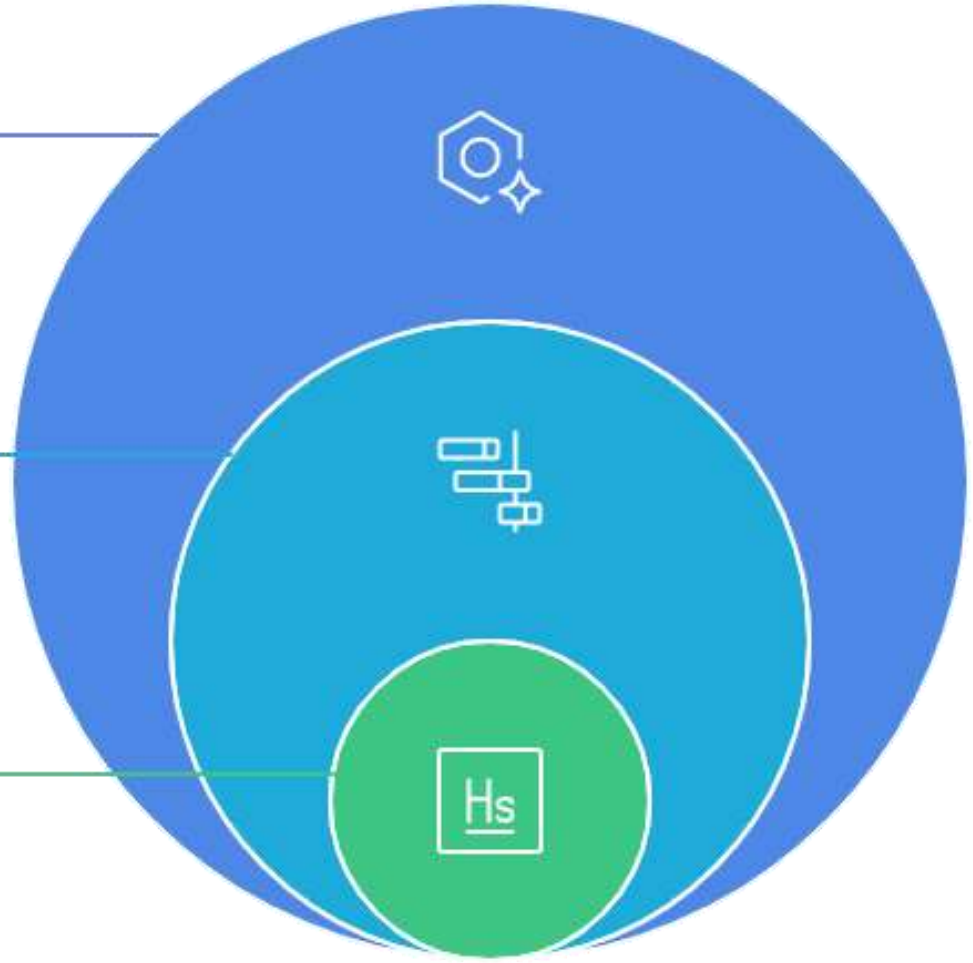
Specific reaction influencing optimal pH

Enzyme Composition

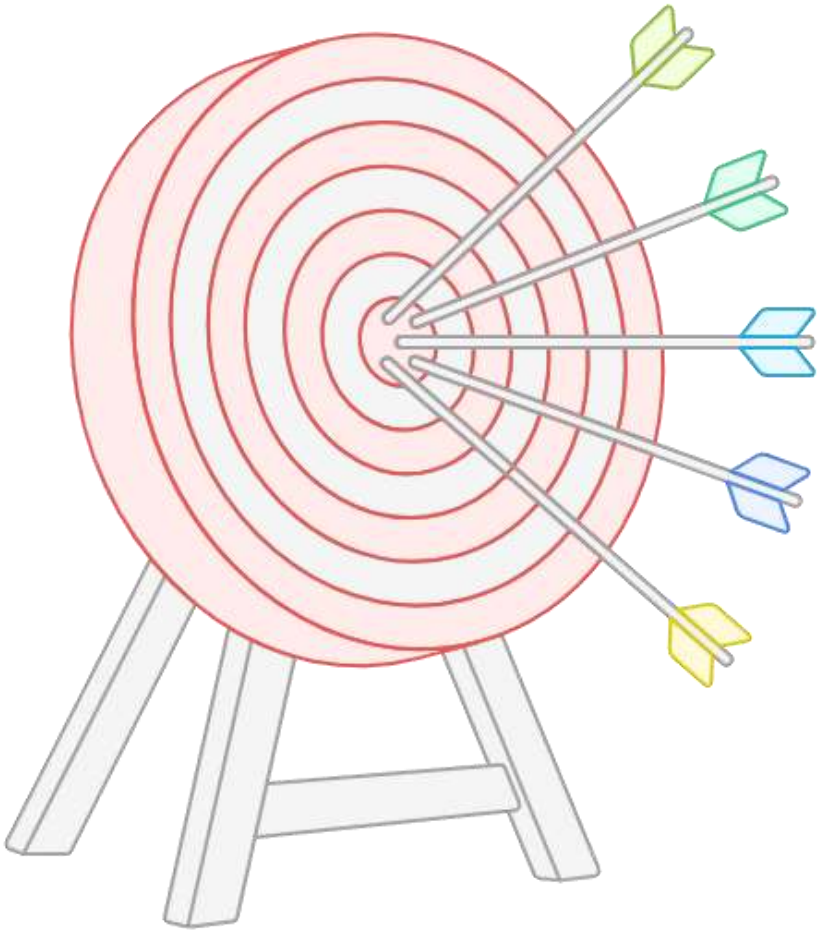
Amino acid structure affecting pH sensitivity

Optimal pH

pH at which enzyme activity is maximized



pH Effects on Enzyme Activity



Catalytic Activity

Core function of enzymes

Substrate Binding

Interaction with reactants

Enzyme Conformation

Structural shape affecting function

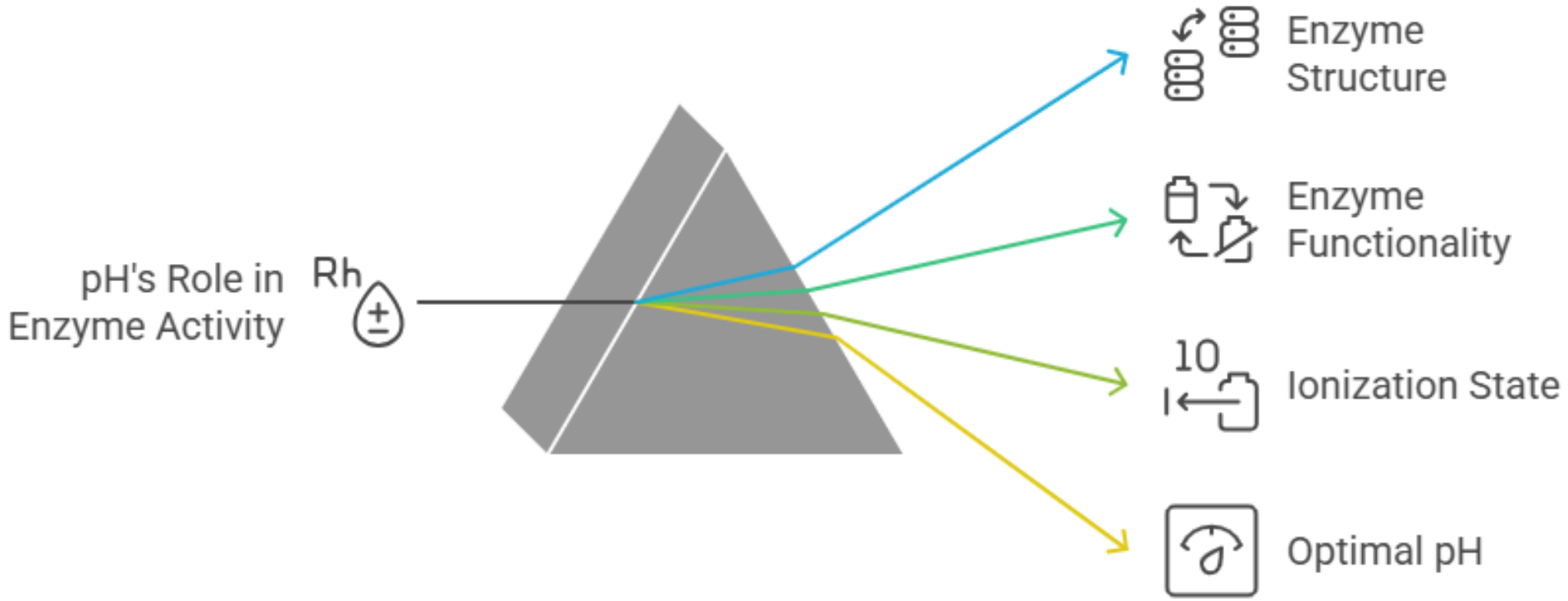
Ionization State

Charge of amino acid residues

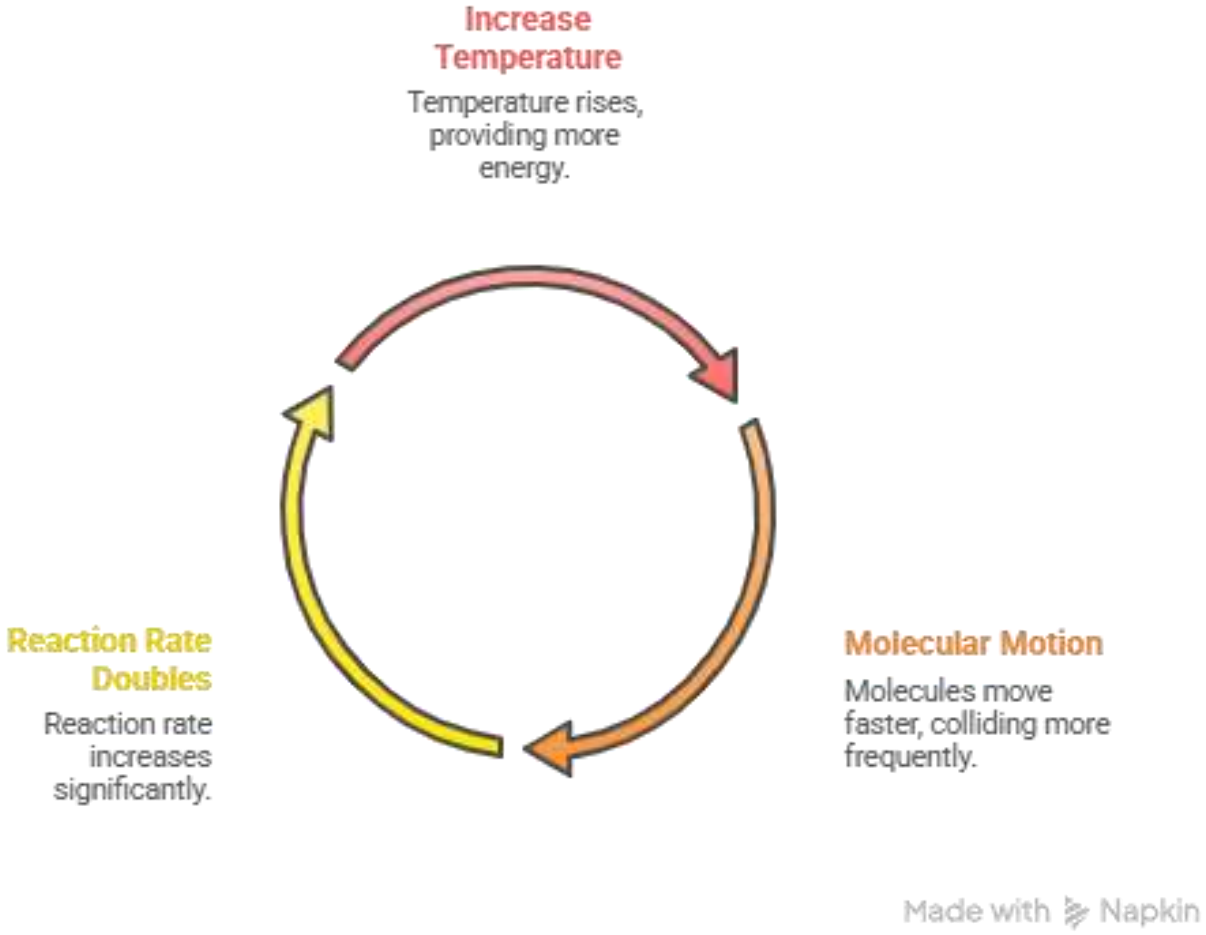
pH

Environmental factor affecting ionization

Unveiling pH's Influence on Enzyme Activity

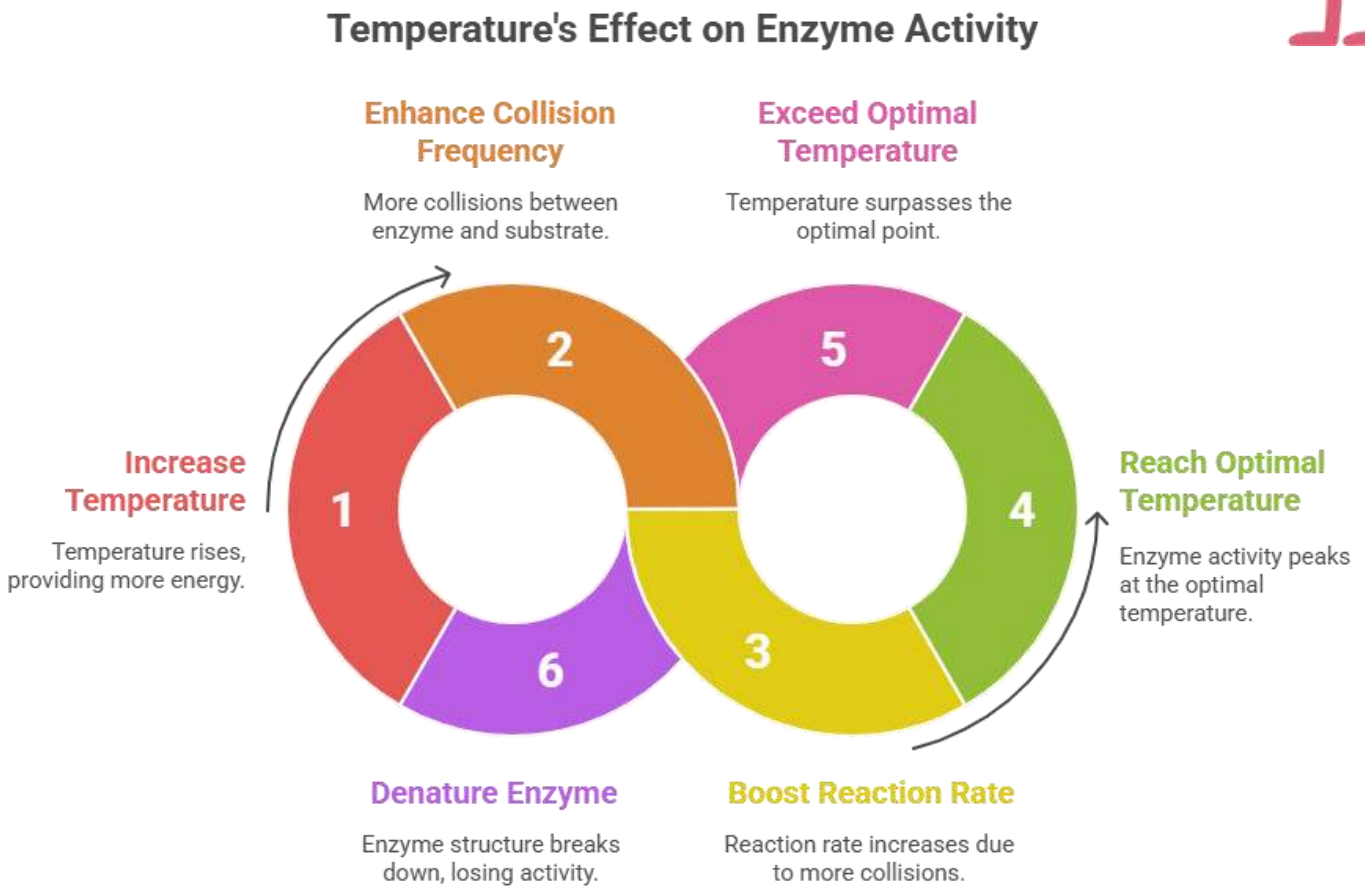


Temperature's Effect on Enzyme Activity

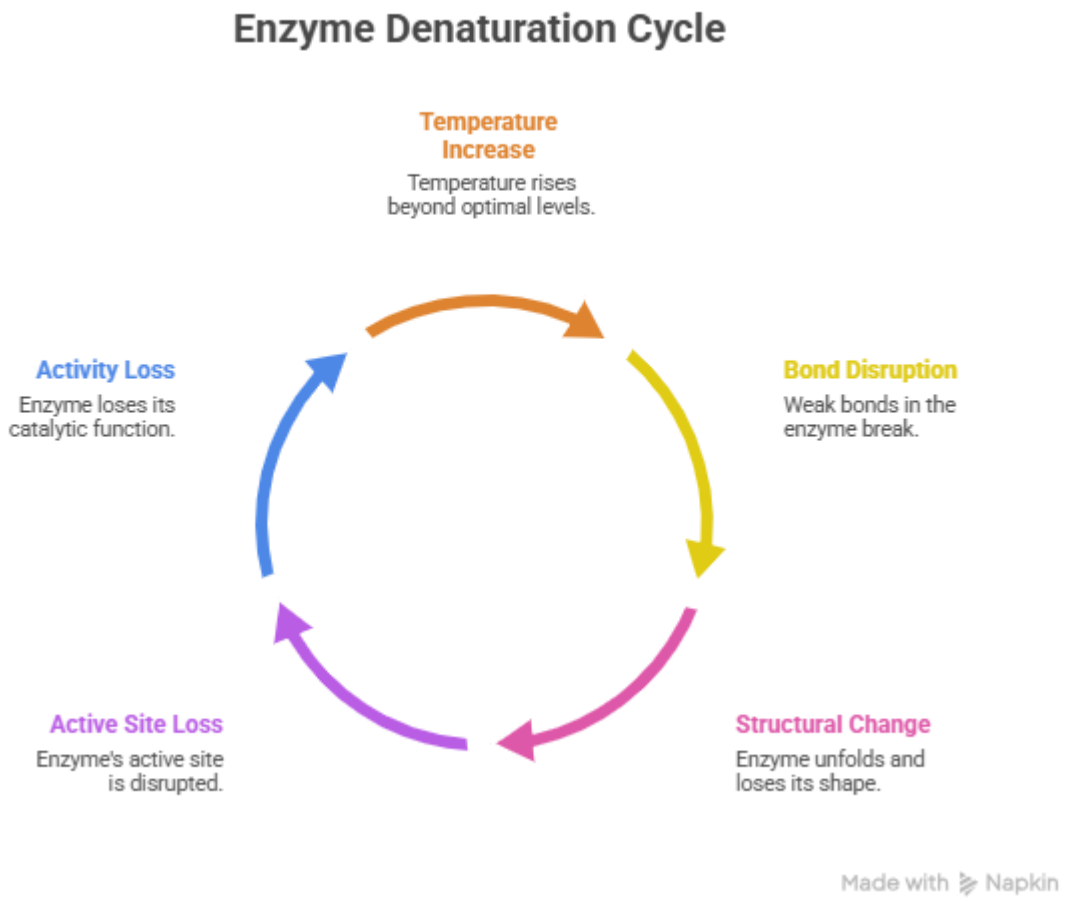


CLASS ASSESSMENTS

Make a note on temperature effect on activity of enzyme?



SUMMARY


Enzyme Denaturation Cycle
Temperature Increase
Temperature rises beyond optimal levels.
Bond Disruption
Weak bonds in the enzyme break.
Structural Change
Enzyme unfolds and loses its shape.
Active Site Loss
Enzyme's active site is disrupted.
Activity Loss
Enzyme loses its catalytic function.
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REFERENCES

- ✓ Herpes review of biochemistry-Martin
- ✓ Text book of biochemistry- D. Satyanarayana
- ✓ Text book of clinical chemistry-Alex Kaplan & Laverve L szabo
- ✓ Principles of biochemistry-Lehninger
- ✓ Text book of biochemistry-Ramarao


thank you