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 : IUB CLASSIFICATION

DESIGN THINKING IN IUB CLASSIFICATION

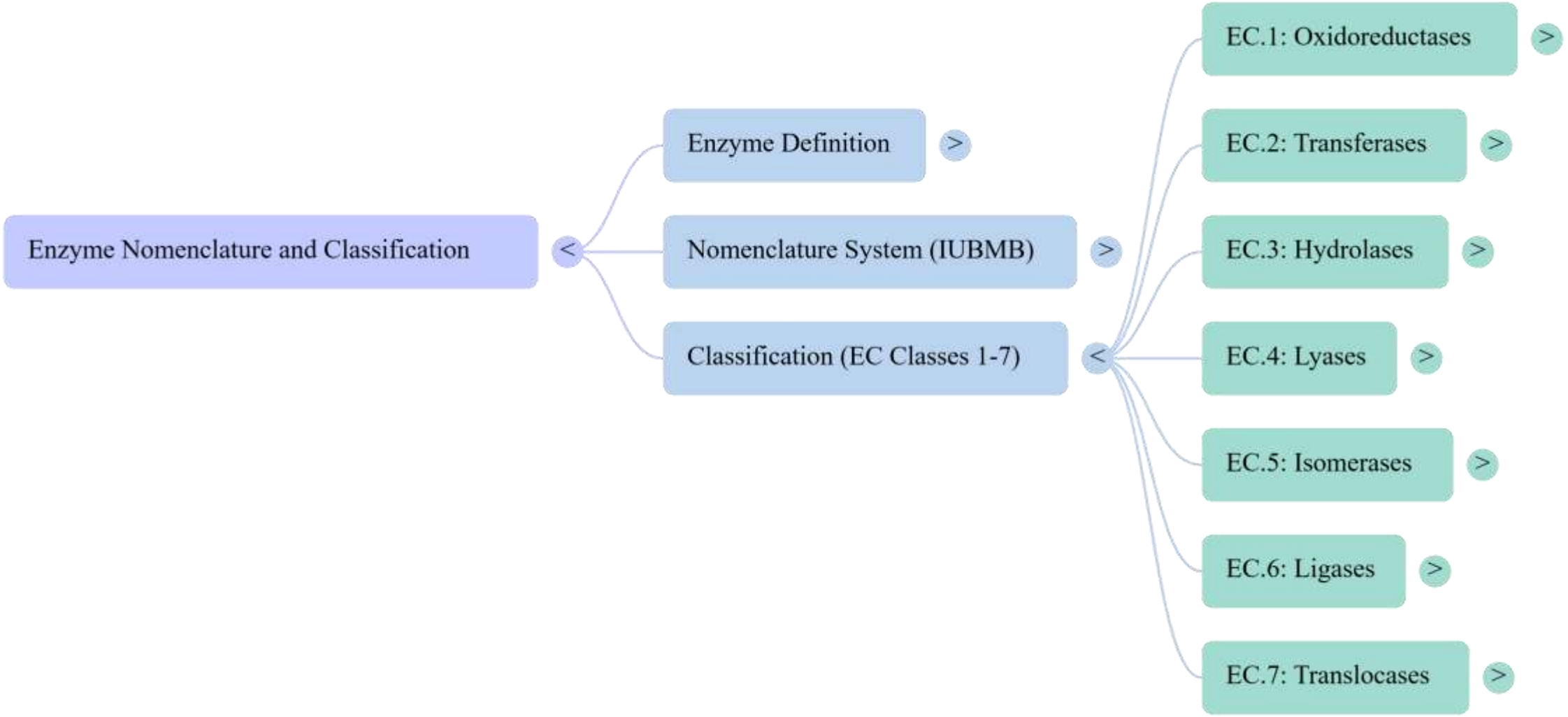
1.Empathize: Deeply understand the student's or learner's challenges, needs, and experiences. This involves engaging with students, educators, and biologists to uncover pain points, preferences, and unmet needs in understanding microscopic cell processes.

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.

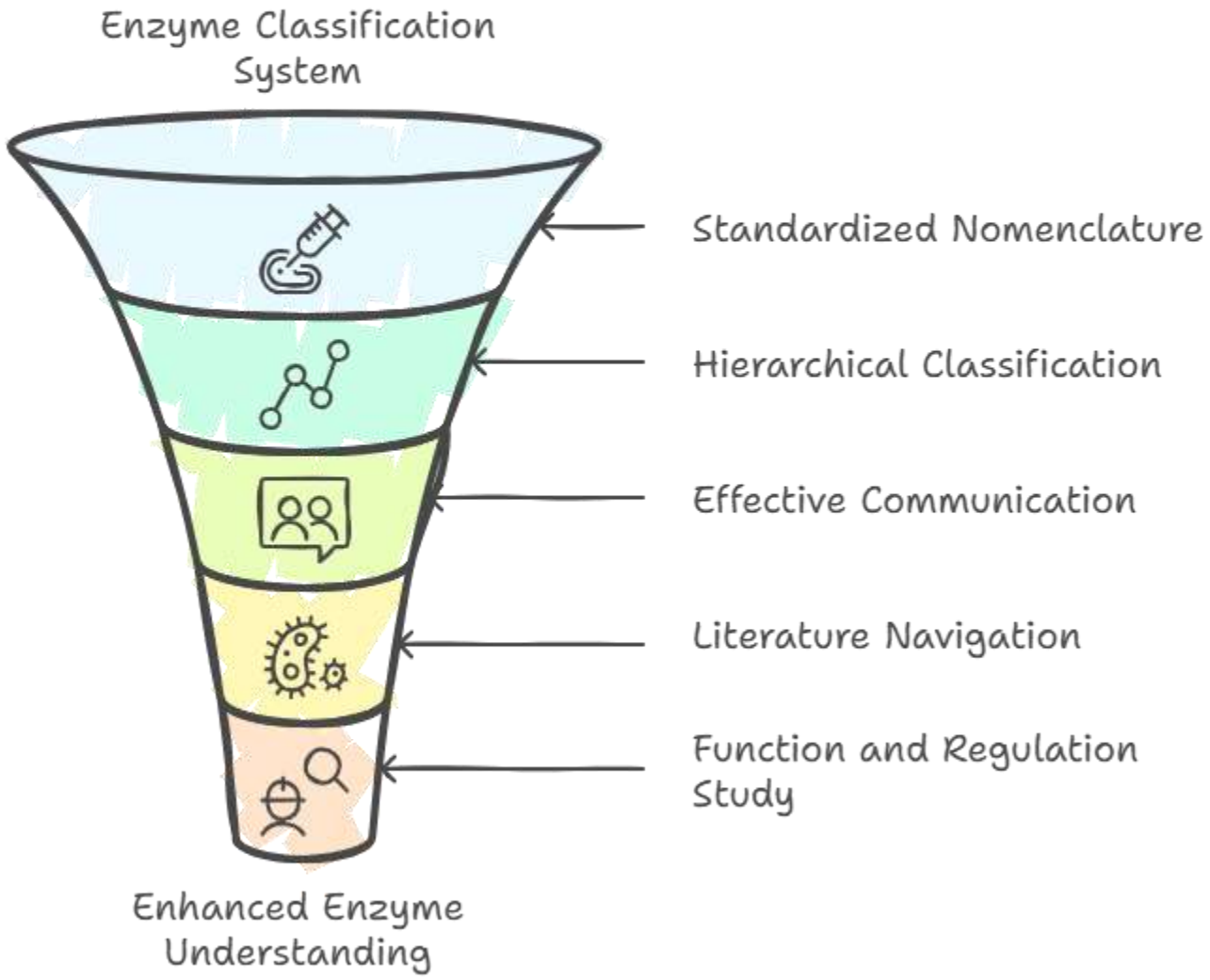
3.Ideate: Brainstorm and explore a wide range of ideas and potential explanations, including innovative diagrams or models.

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

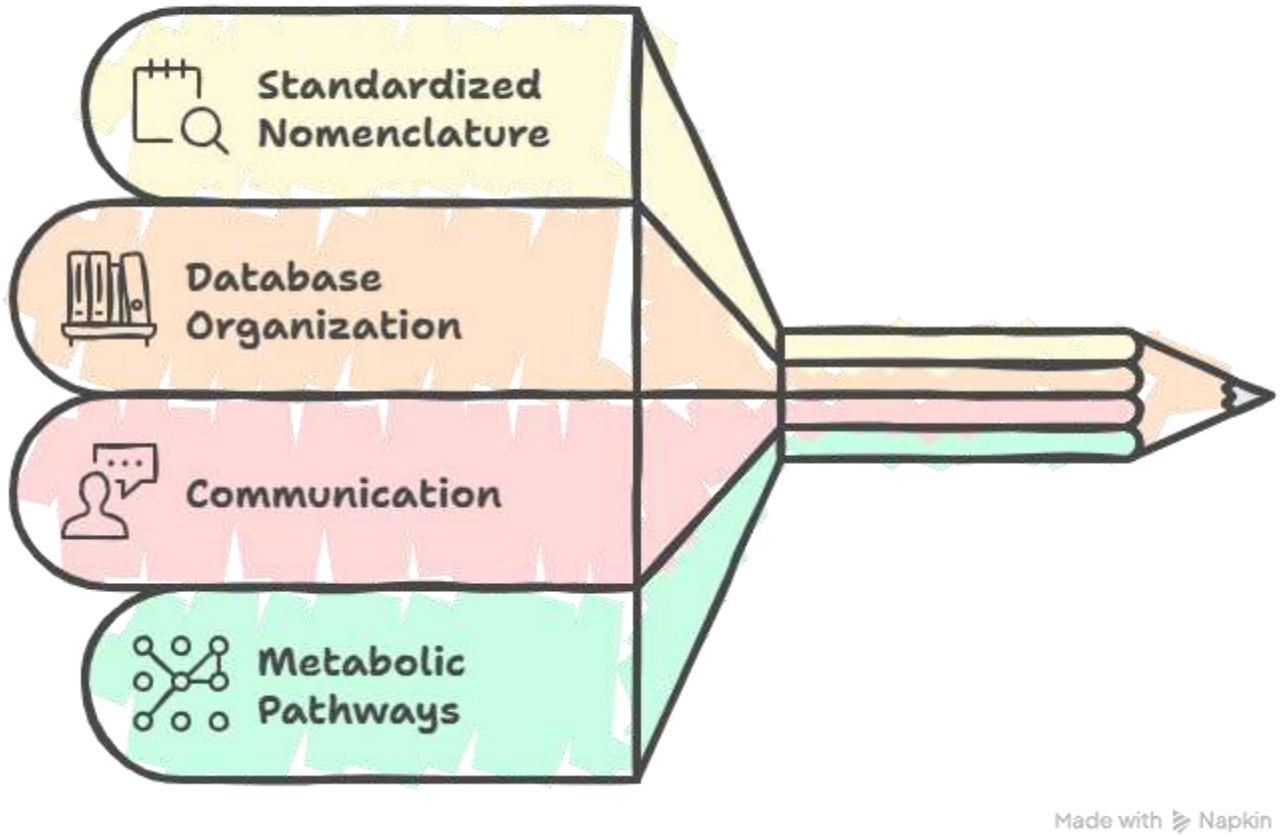
MINDMAP


Enzyme Nomenclature and Classification
Enzyme Definition
Nomenclature System (IUBMB)
Classification (EC Classes 1-7)
EC.1: Oxidoreductases
EC.2: Transferases
EC.3: Hydrolases
EC.4: Lyases
EC.5: Isomerases
EC.6: Ligases
EC.7: Translocases

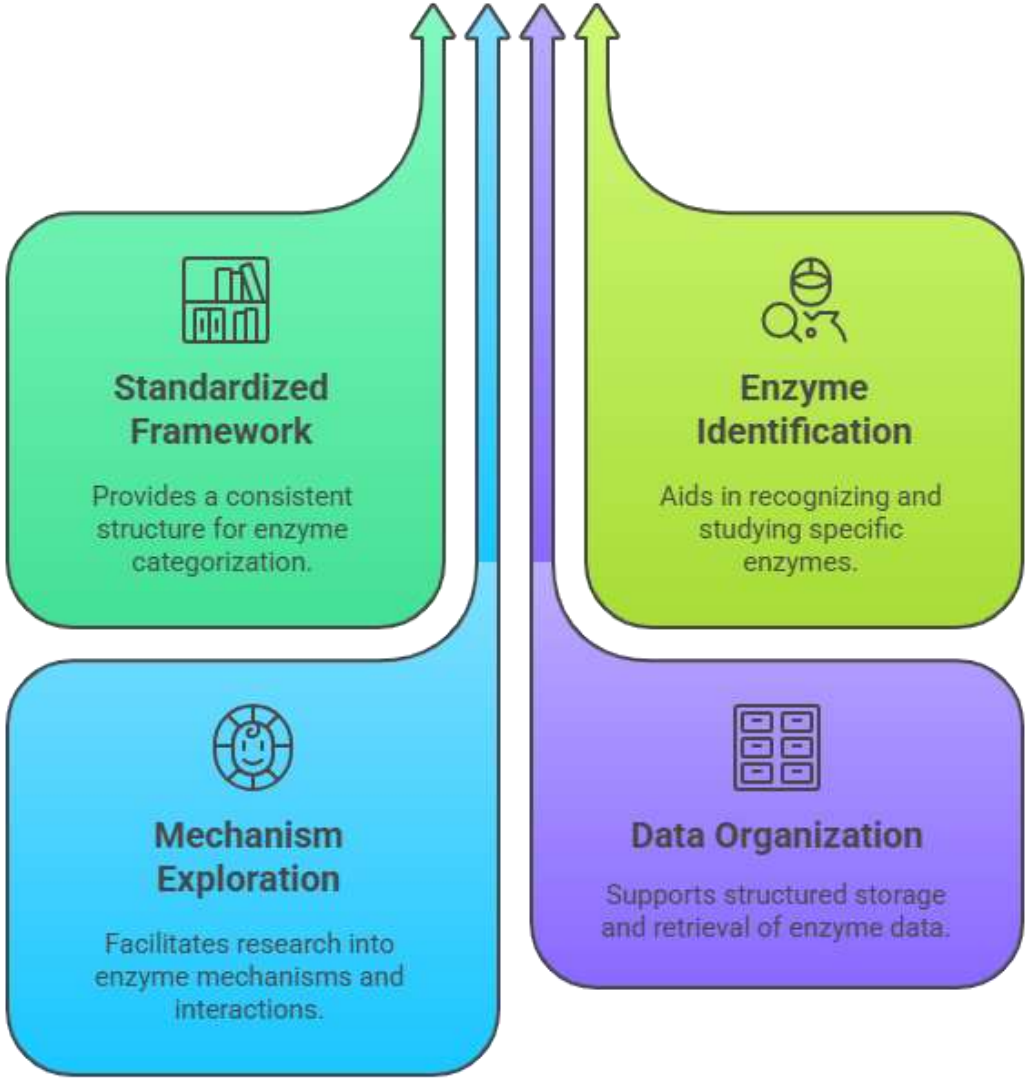
Understanding Enzyme Classification



Pathways to Clarity



Unlocking Enzyme Mysteries



The Role of Ligases in Biochemistry

Subclasses

Forms carbon-oxygen, carbon-sulfur, and carbon-nitrogen bonds

Reaction Type

Joins two molecules using ATP hydrolysis

Mechanism

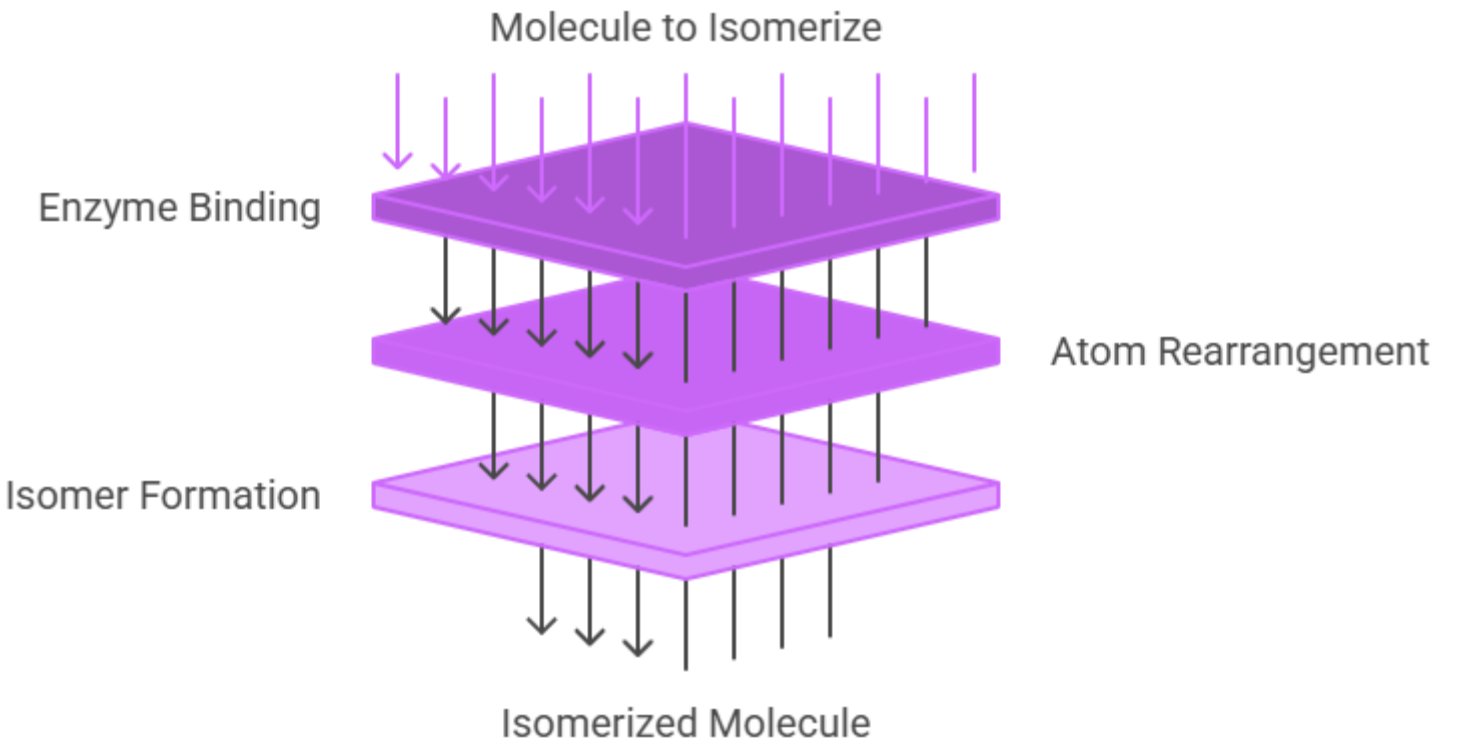
Utilizes ATP energy to form chemical bonds

Examples

Aminoacyl-tRNA synthetases, DNA ligases, carboxylases

Made with Napkin

Isomerization Process Funnel



Which enzyme class catalyzes the cleavage of chemical bonds without hydrolysis or oxidation?

Isomerases

Catalyze isomerization, converting molecules between isomers.

Lyases

Catalyze bond cleavage forming double bonds or rings.

Oxidoreductases

Catalyze oxidation-reduction reactions involving electron transfer.

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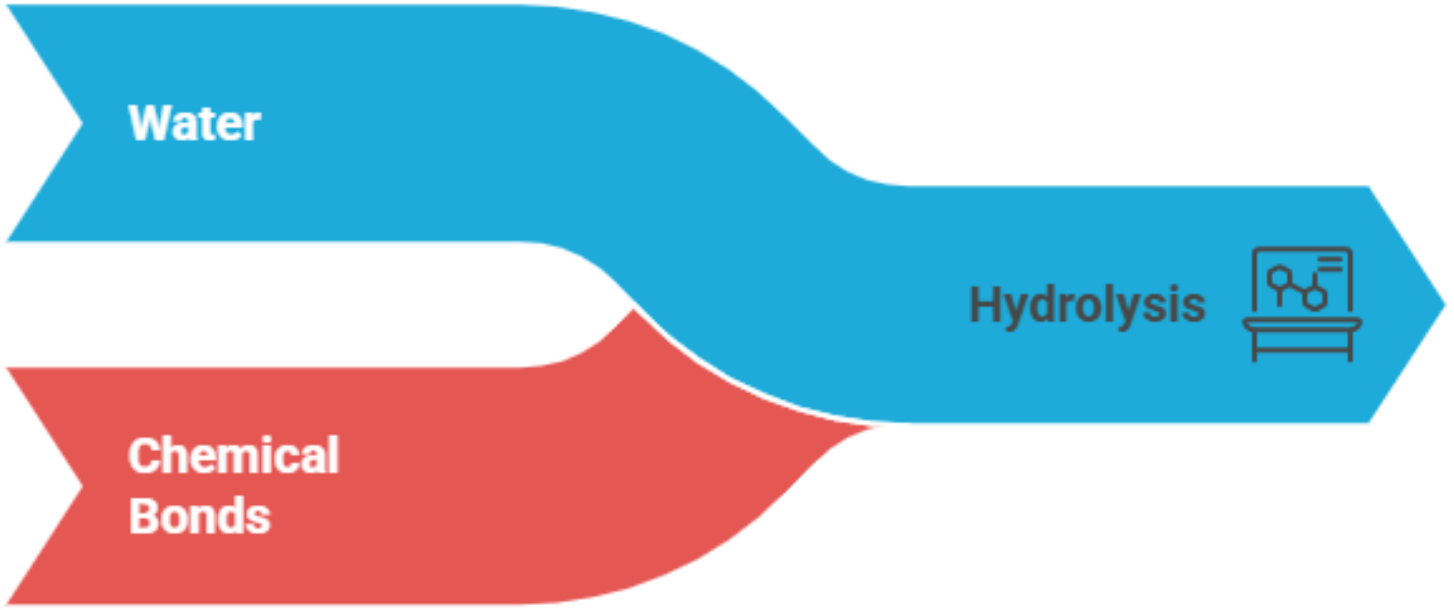
The Role of Water in Hydrolysis

1 Essential reactant for bond cleavage.

2 Bonds broken by water's hydrolytic action.



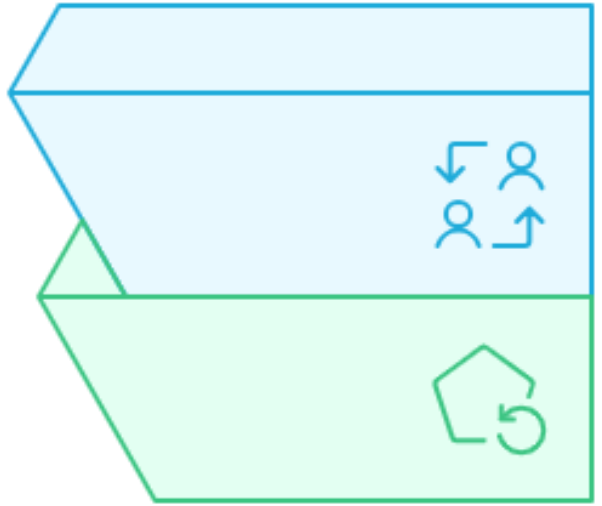
Functional Group Transfer Process

1 **Functional Group Transfer**

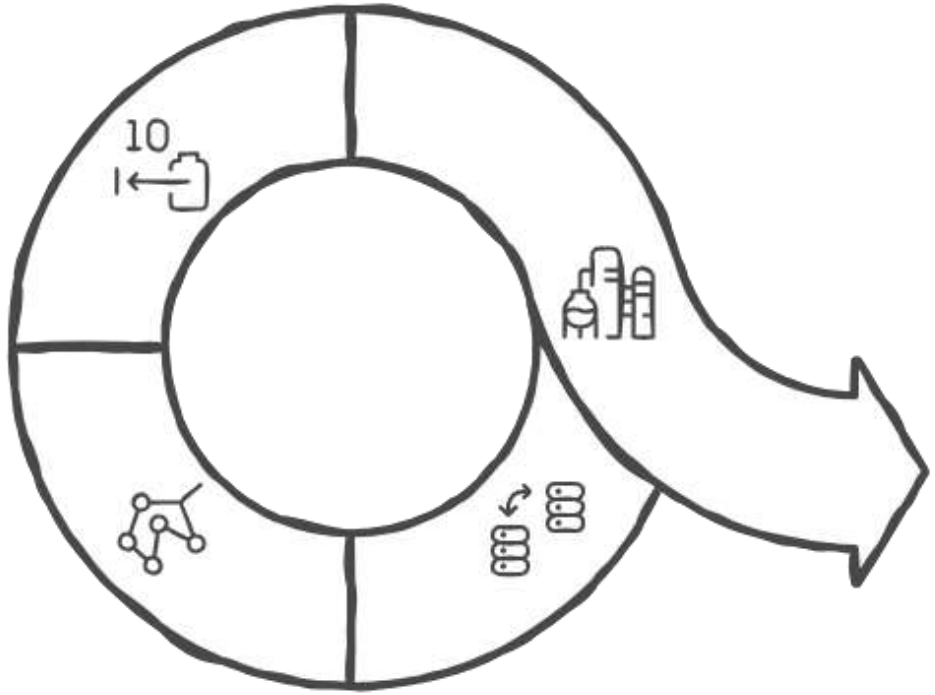
Transfer of the group to the acceptor

2 **Acceptor Molecule**

Molecule receiving the functional group



Oxidoreductase Reaction Cycle



1

Electron Transfer

Electrons move from reductant to oxidant.

2

Oxidation

Reductant loses electrons, becoming oxidized.

3

Reduction

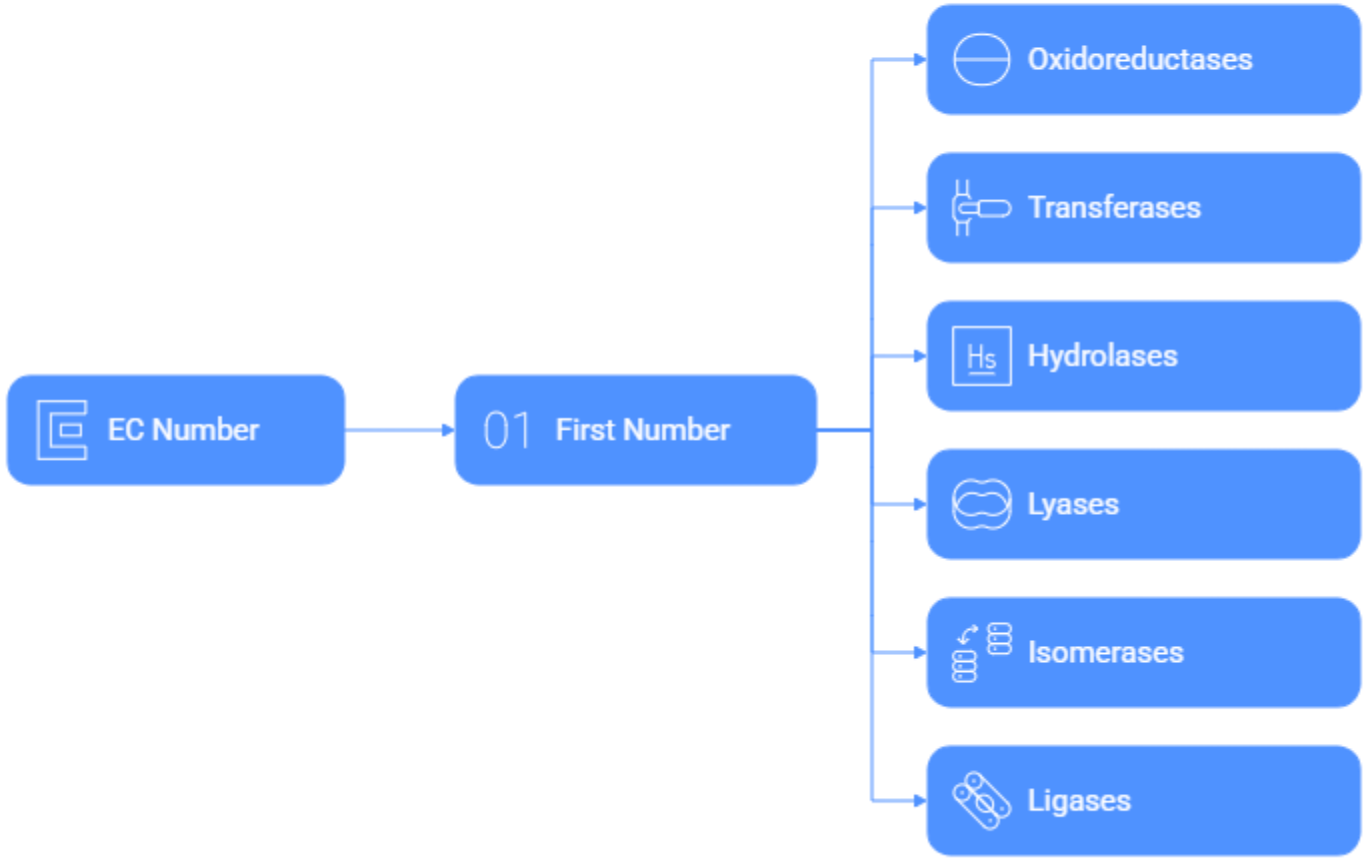
Oxidant gains electrons, becoming reduced.

4

Product Formation

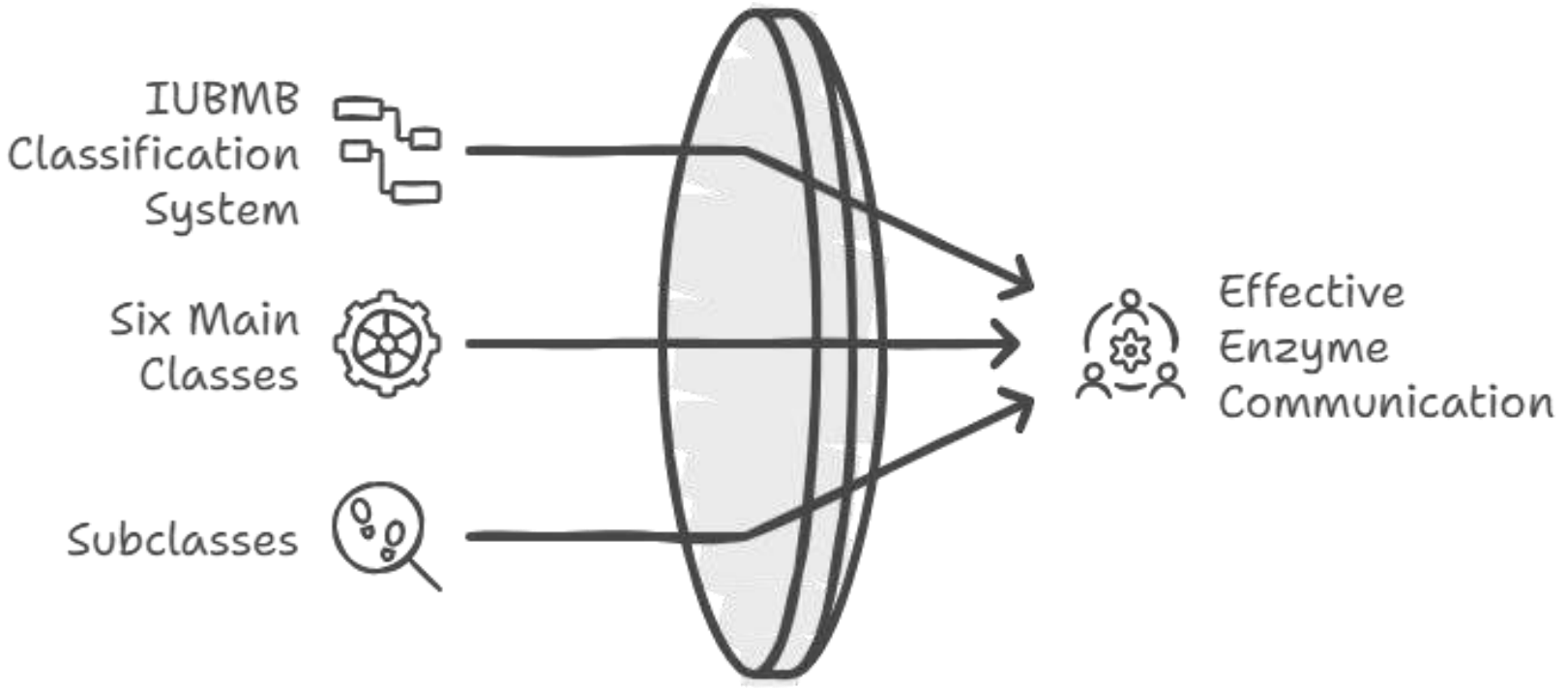
Oxidized and reduced products are formed.

Enzyme Classification System

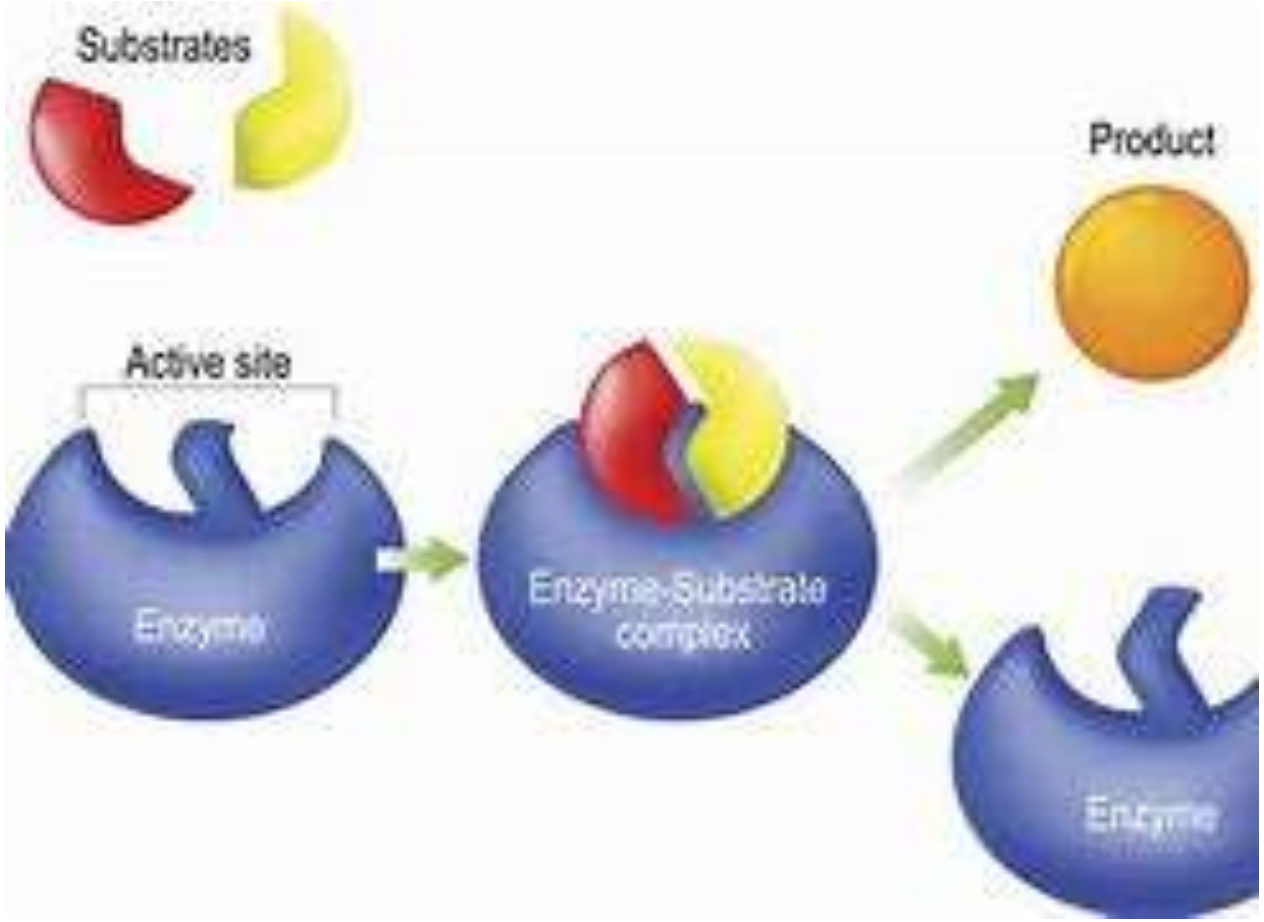


Made with Napkin

Unifying Enzyme Knowledge

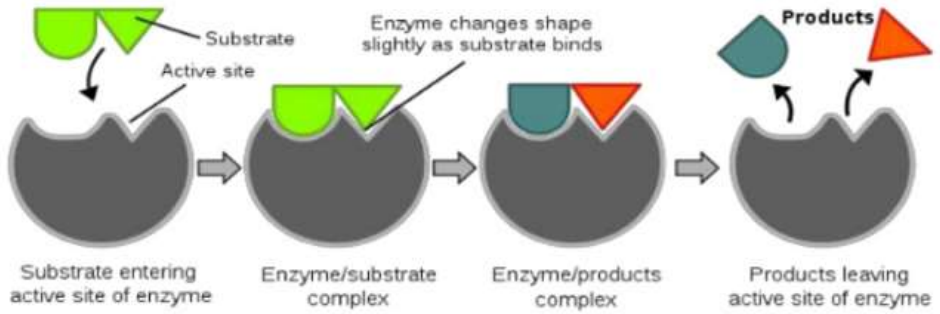


ENZYME & SUBSTRATE



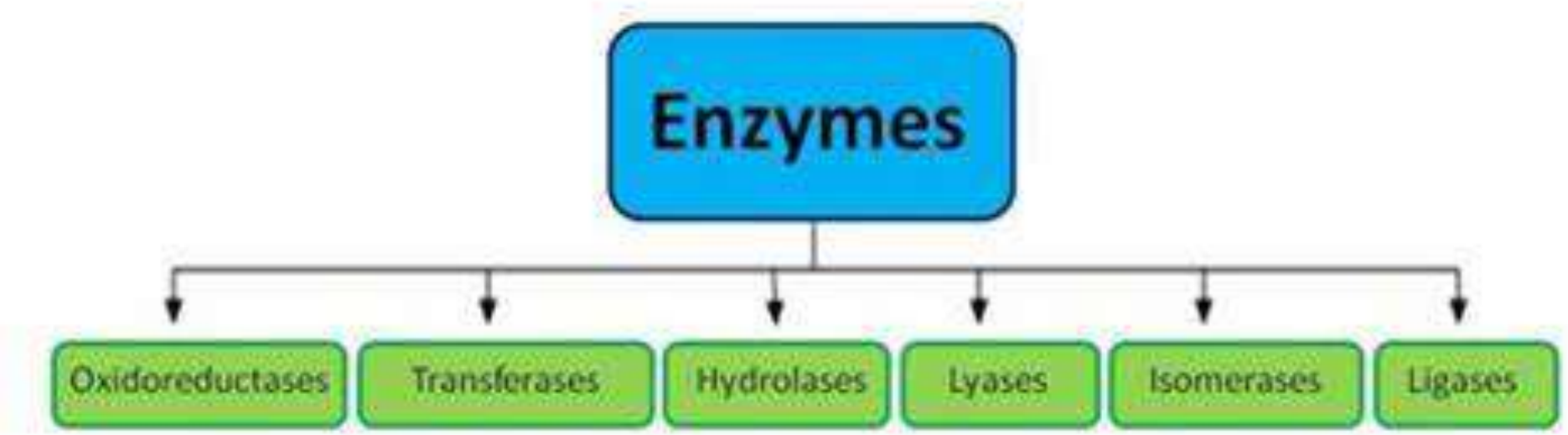
Nomenclature and Classification of Enzymes

$$E + S \rightleftharpoons ES \rightleftharpoons EP \rightleftharpoons E + P$$



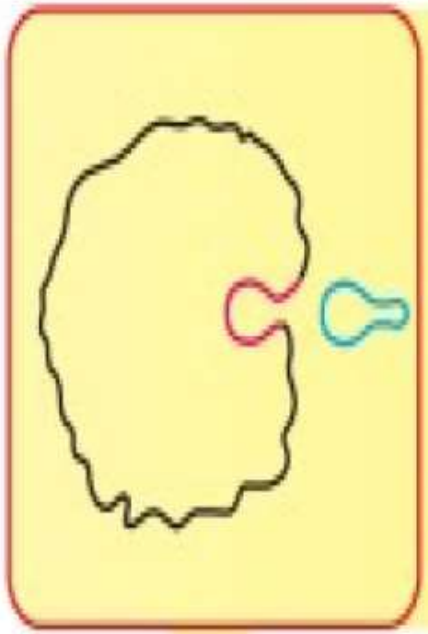
CLASS ASSESSMENTS

Classify enzymes with example?



SUMMARY

ENZYMES



The enzymes speak :

"We are the catalysts of the living world!
Protein in nature, and in action specific,
rapid and accurate;
Huge in size but with small active centres;
Highly exploited for disease diagnosis in lab centres."

A GOOD TEACHER IS ALWAYS A GOOD CATALYST IN STUDENTS' LIFE

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