PHARM.D • YEAR 1

Medicinal Biochemistry

CHAPTER 2

Enzymes

PPT CHAPTER COVER



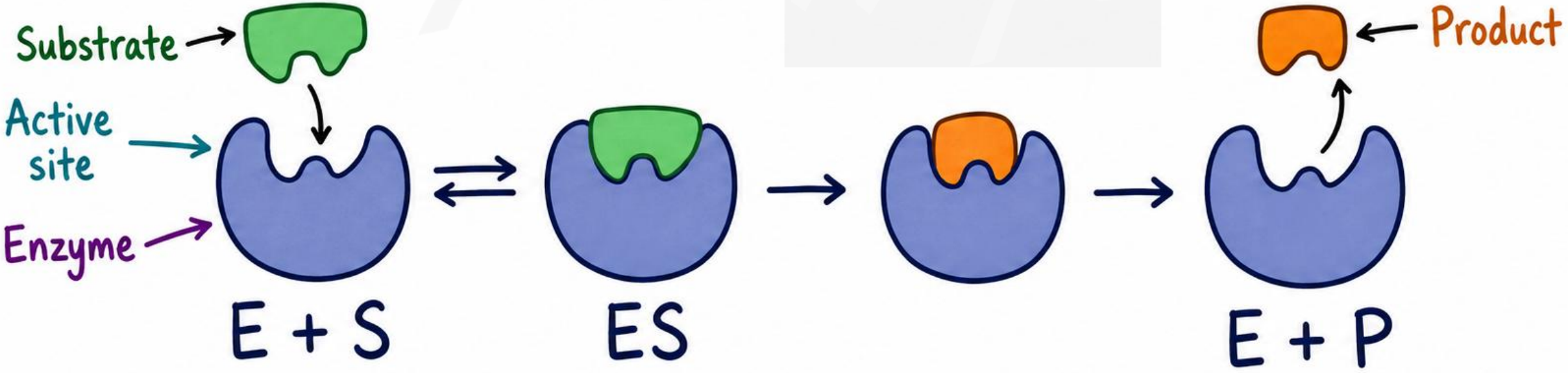
ENZYMES: BIOLOGICAL CATALYSTS

Enzymes accelerate biological reactions without being consumed.

Most are proteins, while catalytic RNA molecules are ribozymes.

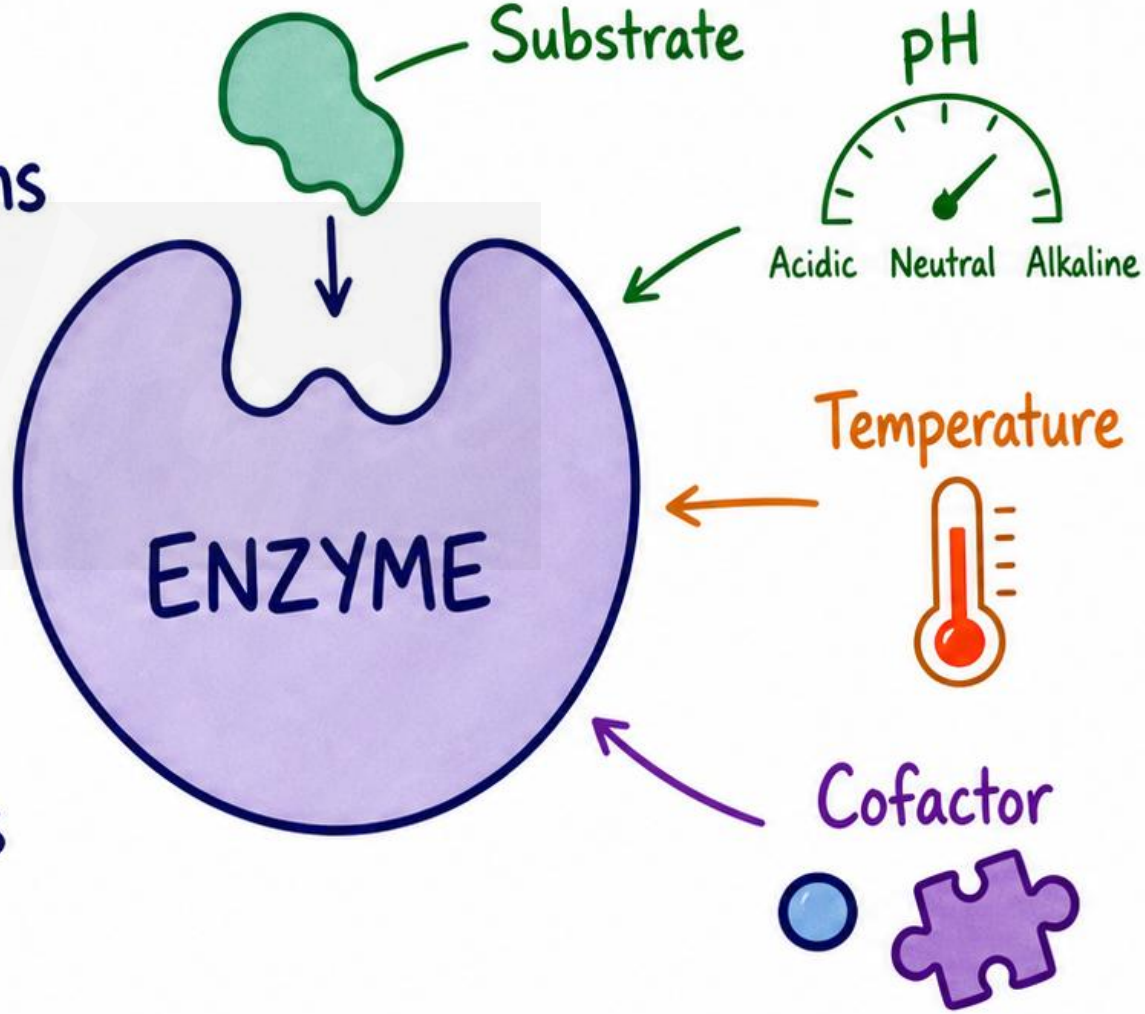
The active site binds substrate and supports catalysis.

Examples include digestive enzymes, metabolic enzymes and DNA polymerases.



KEY PROPERTIES OF ENZYMES

- Enzymes show substrate and reaction specificity.
- Their activity depends on conditions such as pH and temperature.
- Many require cofactors and undergo regulation.
- Increasing substrate eventually saturates active sites.
- Enzymes accelerate both directions of a reversible reaction without changing its equilibrium.



EC CLASSES 1-3

EC classification groups enzymes by the reaction they catalyze.

EC 1: oxidoreductases transfer electrons. Example: alcohol dehydrogenase.

EC 2: transferases move functional groups. Example: hexokinase.

EC 3: hydrolases cleave bonds using water. Example: lipase.

EC 1: oxidoreductases



EC 2: transferases



EC 3: hydrolases



EC CLASSES 4-7

The current EC system has seven main classes.

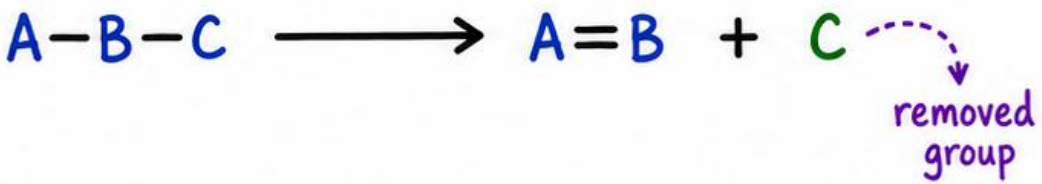
EC 4: lyases remove or add groups without hydrolysis or oxidation.

EC 5: isomerases rearrange molecules.

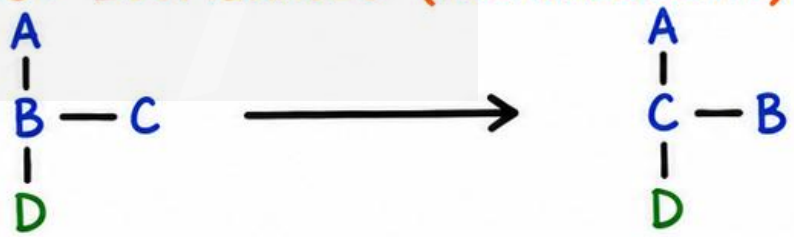
EC 6: ligases join molecules using energy.

EC 7: translocases catalyze movement across membranes.

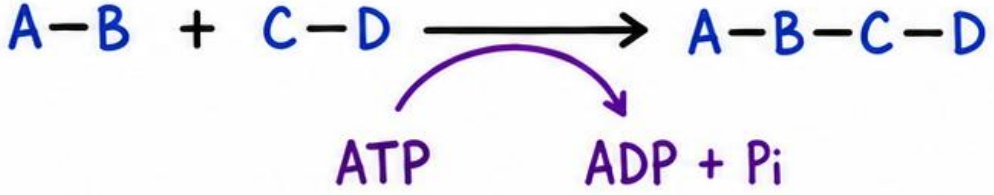
EC 4: LYASES (ELIMINATION)



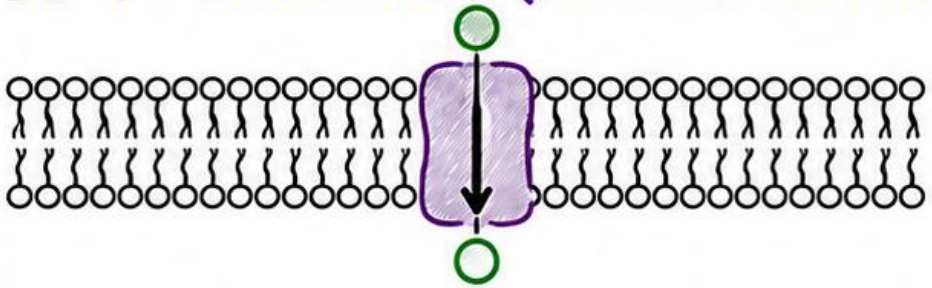
EC 5: ISOMERASES (REARRANGEMENT)



EC 6: LIGASES (JOINING)



EC 7: TRANSLOCASES (MEMBRANE MOVEMENT)



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