

Nomenclature of enzymes

→ In most cases ENZYMES name end in - **ase**

→ Urea ⇒ Urease. // Lactose ⇒ Lactase. **substrate.**
① remove **a**
② replace with **ase**
① remove **ose**
② replace with **ase**

Lactate dehydrogenase // pyruvate decarboxylase.

* pyruvate carboxylase.
addition of carbon dioxide.

pyruvic acid.

remove carbon dioxide
CO₂

Substrate
anal

reaction catalyzed!

more preferable because it shows the type of reaction and its nature.

Catalase / pepsin / chymotrypsin / Trypsin.

→ Peptidase's enzyme which break down peptides into amino acids.

* peptidases are included under a large category of enzymes called (Hydrolases).

no direct relationship

to substrate or reaction

type!

Classification of Enzymes

* Enzyme Commission (EC). according to IUBMB ^{unit} ^{Biochemistry} ^{Molecular} ^{Biology} _{international}

* Each Enzyme was given 4 digit numbers. (Numerical code).

- major class \Rightarrow 1st \Rightarrow enzyme activity.
- subclass \Rightarrow 2nd \Rightarrow substrals, bond cleaved.
- sub-subclass \Rightarrow 3rd \Rightarrow group acted upon / cofactor required
- 4th \Rightarrow Serial number.

* in Biological system oxidation reaction must be coupled with reduction rxn.

① oxidoreductases catalyze redox reaction.

Reductases \leftarrow Oxi dases.

[Alcohol dehydrogenase]

* ① is not allowed to be alone because it will change the pH it need a carrier [NAD⁺].

② Transferases transfer a group from one molecule to another

[Hexokinase].

* Kinases \Rightarrow transfer a phosphate group

* Transaminases \Rightarrow transfer of an amino group.

[phenyl ethanolamine transferase enzyme]

PNMT \Rightarrow Nor. Norepinephrine \rightarrow Epinephrine. (أدرينالين)

* Methyl group \Rightarrow CH₃

* is Methionine (SAM) S-adenosine methionine.

* SAM will be converted to SAH SA Homocysteine.

* Kinases transfers phosphate group. from [ATP] molecule to another molecule

① 1.1.1.

* Lactate dehydrogenase. Lactate $\xrightarrow{NAD^+}$ Pyruvate. \xrightarrow{NADH}

② 7.1.2.

ATP \rightarrow Kinase ADP \rightarrow إنزيم الكيناز

انزيمات الأكل
③ Hydrolases : cleave bonds by adding water. [2.1.3.1] (Esterases) ester in Lipid

* phosphatases (phospholipases) (Glycosidases) glycosidic

* peptidases.

break down fats.

* Lipases. (Triglyceride \Rightarrow fatty acids + Glycerol)

* [Alkaline phosphatase].

④ كذاب

④ Lyases : catalyze removal of groups to form a double bond or the reverse.

[pyruvate decarboxylase]. [4.1.1.1].

* Decarboxylases

* Synthase.

* Fumarase.

Fumarate \Rightarrow Malate. \Rightarrow فومارات \rightarrow مالات

double \Rightarrow single.

* triglyceride Lipase. (glycerol + 3fat).
* they are digestive enzymes.

5 Isomerases. catalyze intramolecular rearrangement.
[Alanine racemase]. [5.1.1.1].

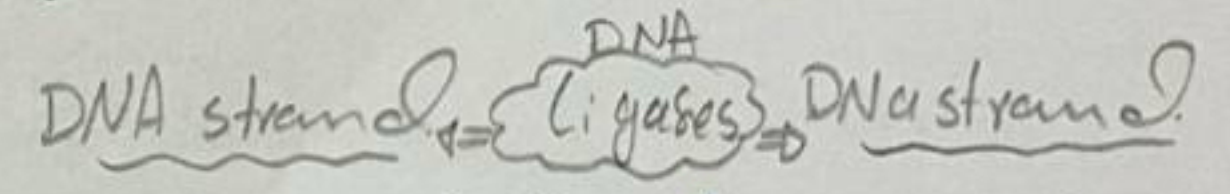
- * Epimerases
- * Mutases
- * phosphoglycerate mutase
- 3-phosphoglycerate \Rightarrow 2-phosphoglycerate.

* Change the position of some groups intramolecular.

* aldehyde \Rightarrow ketone

* Epimers: they are different forms of one molecule with the same number of carbon atoms and the same carbonyl group.
(aldehyde \Rightarrow ketone). glucose / galactose.

6 Ligases. catalyze a reaction in which $\boxed{C-C}$ $\boxed{C-S}$ $\boxed{C-O}$ $\boxed{C-N}$ bonds are made or broken
[Isoleucine-tRNA ligase] [6.1.1.5].



- * result in linking of two molecules with each other
- * require energy for catalyzing the reaction.