Classification of the Enzymes

As per international classification**, the enzymes have been classified into six major classes,** each with several subclasses; within each subclass, formal names have been assigned to the known enzymes to describe the reactions they catalyze. **Trivial names for many enzymes, for example, pepsin, trypsin, urease, etc. are still very common** and easy to remember as well. Many enzymes are still easier to recognize them by their trivial names. The newer nomenclature has been less widely adopted due to its own complications.

NO. Major classes	Example
• Oxidoreductases	• Alcohol dehydrogenase, xanthine oxidase.
• Transferases	• Hexokinase, etc.
• Hydrolases	• Glucose-6- phosphatase, pepsin, carboxypeptidase
• Lyases	• Aldolase, pyruvate decarboxylase
• Isomerases	• Phosphotriose isomerase, phosphoglucomutase
• ligases	• Glutamine synthetase, glutathione synthetase

Six major classes are :

1. Oxidoreducatases : They catalyze a wide variety of oxidation-reductions reaction and frequently employ coenzymes such as NAD^+, $NADP^+$, FAD, or lipoate as the hydrogen acceptor. Other acceptors include coenzyme Q or molecular oxygen. **Common trivial names include dehydrogenase, oxidase, peroxides, and reductase.**

2. Transferases : They catalyze various kinds of group transfers. Many important steps in metabolism require transfer from one molecuale to another of amino, carboxyl, carbonyl, methyl, acyl, glycosyl, or phosphoryl groups.

Common trivail names include amino transferase (transaminase), acyl carnitine transferase and transcarboxylase.

3. Hydrolases : They catalyze cleavage of bonds between a carbon and some other atom by addition of water. **Some common trivial names include esterase, peptidase, amylase, urease, phosphatase, pepsin, trypsin and chymotrypsin.**

4. Lyases : They catalyze breakage of carbon-carbon, carbon-sulphur and certain carbon-nitrogen (excluding peptide bonds. **Common trivial names include decarboxylase, aldolase, citrate lyase and dehydratase.**

5. Isomerases : They catalyze racemisation of optical or geometric isomers and certain intramolecular oxidation-reduction reactions. **Trivial names include epimerase, racemase, and mutase.**

6. Ligases : These catalyze the formation of bonds between carbon and oxygen, sulphur, nitrogen and other atoms. The energy required for bond formation is frequently derived from the hydrolysis of ATP. **Some trivial names include synthetase and carboxylase.**

Examples of Isoenzymes are :

- Lactate dehydrogenase **(LDH)**
- Creatine phosphokinase **(CPK or CK)**
- Alkaline phosphatase **(ALP)**
- Malate dehydrogenase
- Carbonic anhydrase
- Hexokinase
- Phoshorylase
- Glucose-6-phosphate dehydrogenase, etc.