

# **Classification and Nomenclature of Enzymes** (6<sup>th</sup> Sem)

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# The Six Classes

1. Oxidoreductases
2. Transferases
3. Hydrolases
4. Lyases
5. Isomerases
6. Ligases

- Oxidoreductases :
  - Catalyze the transfer of hydrogen or oxygen atoms or electrons from one substrate to another, also called oxidases, dehydrogenases, or reductases. Note that since these are 'redox' reactions, an electron donor/acceptor is also required to complete the reaction.
- Transferases :
  - catalyze group transfer reactions, excluding oxidoreductases (which transfer hydrogen or oxygen and are ec 1). These are of the general form:
    - $A-x + b \leftrightarrow bx + a$
- Ligases:
  - Catalyzes the synthesis of various (mostly C-X) bonds, coupled with the breakdown of energy-containing substrates, usually AT

- Hydrolases :

- Catalyze hydrolytic reactions. Includes lipases, esterases, nitrilases, peptidases/proteases. These are of the general form:



- Lyases:

Catalyze non-hydrolytic removal of functional groups from substrates, often creating a double bond in the product; or the reverse reaction, i.e., Addition of function groups across a double bond.



- includes decarboxylases and aldolases in the removal direction, and synthases in the addition direction.

- Isomerases :

- Catalyzes isomerization reactions, including racemizations and cis- tran isomerizations.