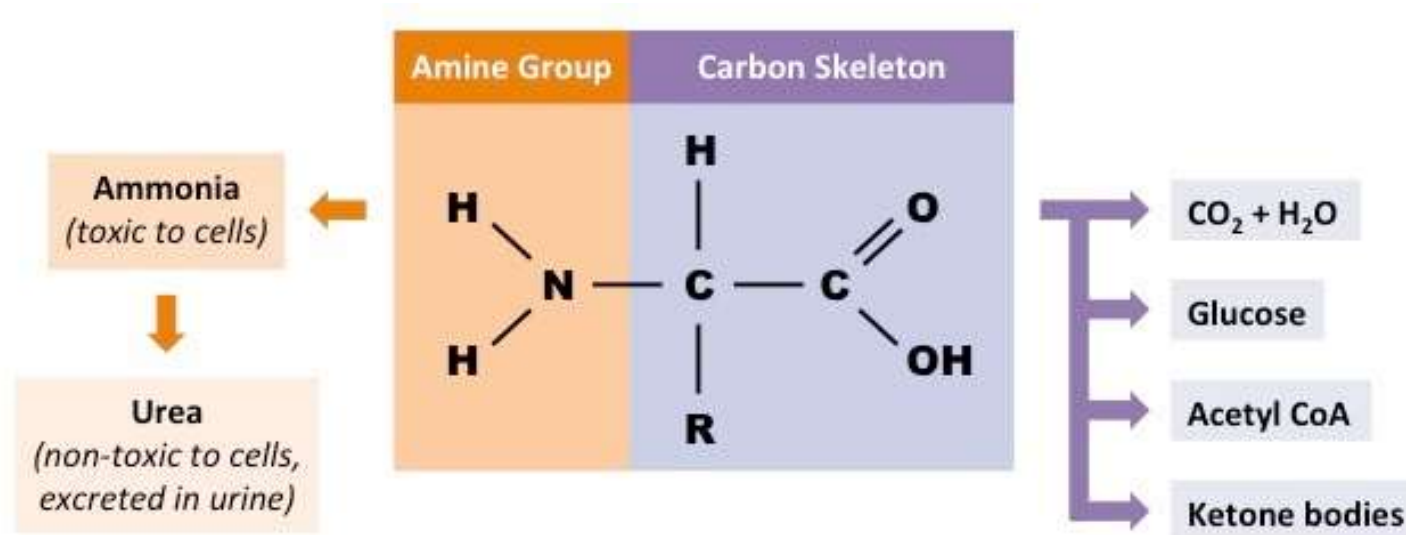


Deamination



Fate of Amino acid



- **Deamination** is the removal of an **α amino group** from a molecule. Amino group is converted into ammonia while the amino acid itself converts into its corresponding keto acid.
- Enzymes that catalyse this reaction are called deaminases.
- In the human body, deamination takes place primarily in the **liver**, **however it is also deaminated in the kidney.**

Oxidative deamination

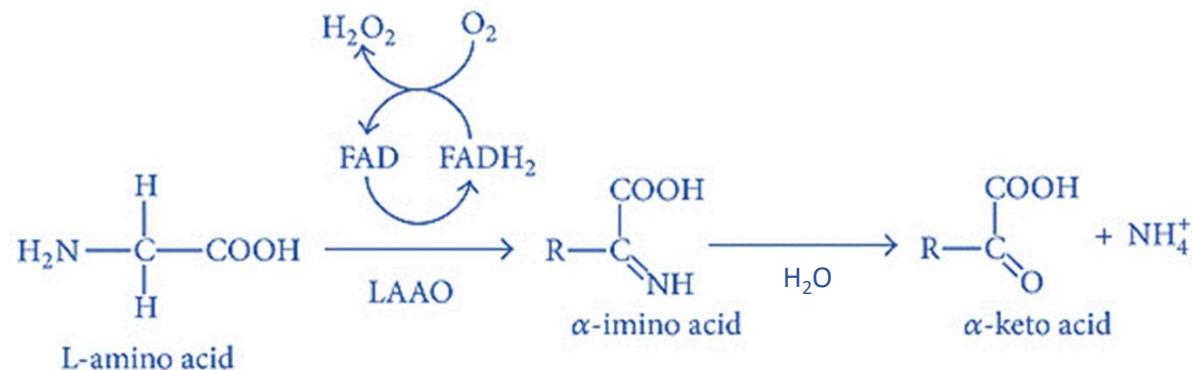
Subhadipa 2020

Oxidative deamination is stereospecific and is catalyzed by L- or D-amino acid oxidase. The initial step is removal of two hydrogen atoms by the flavin coenzyme, with formation of an unstable α -amino acid intermediate. This intermediate undergoes decomposition by addition of water and forms the ammonium ion and the corresponding α -keto acid. Presence of O_2 is essential.

By the help of

L-amino acid oxidase (LAAO)

- Enzyme present in mitochondria, peroxisomes and ER of mammalian kidneys and liver only.
- It contains FMN/FAD as the prosthetic group.
- It can't act on glycine and L-isomers basic amino acids.

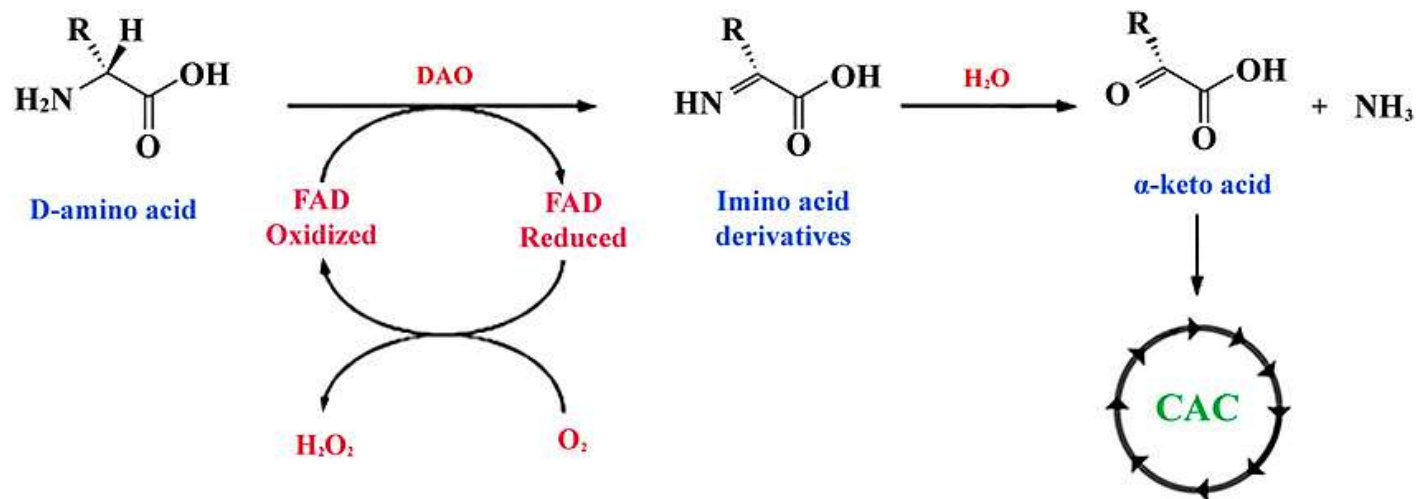


By the help of
D-amino acid oxidase (DAO)

It occurs in peroxisomes of mammalian liver and kidneys.

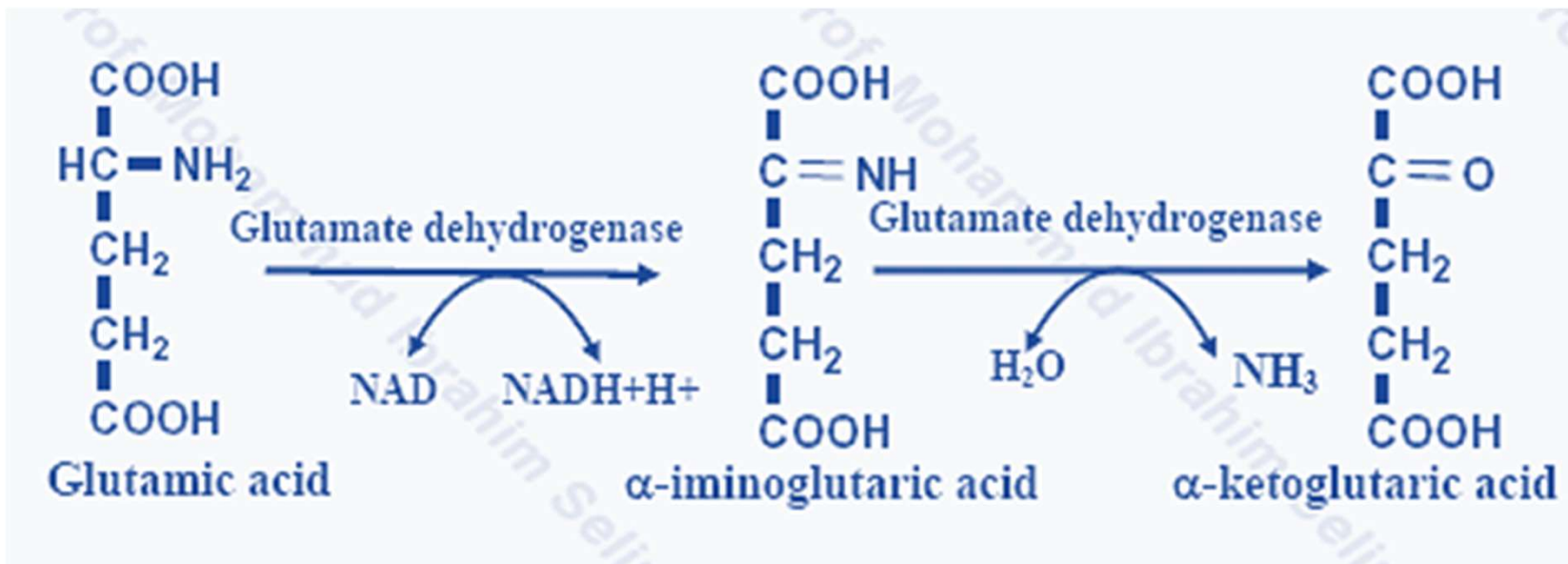
It can't act on D-isomers of glutamic acid, asparagine, dicarboxylic acid and basic amino acids.

It contains FAD as prosthetic group.



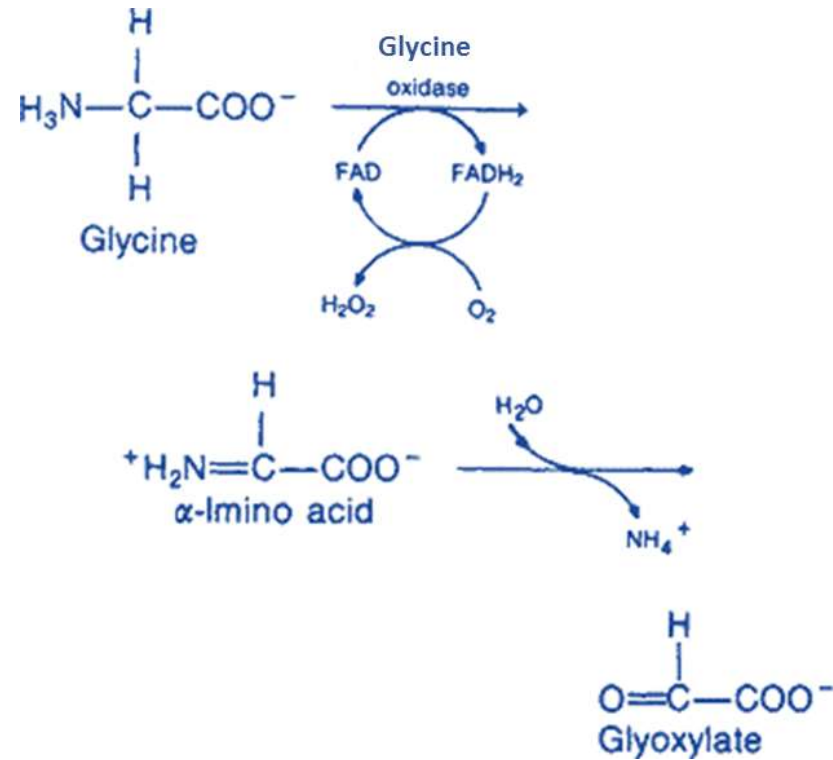
By the help of
Glutamate dehydrogenase

- It is present in all tissue.
- It needs NAD or NADP as coenzyme.



By the help of Glycine oxidase

- FAD as a prosthetic group.
- Act on glycine.

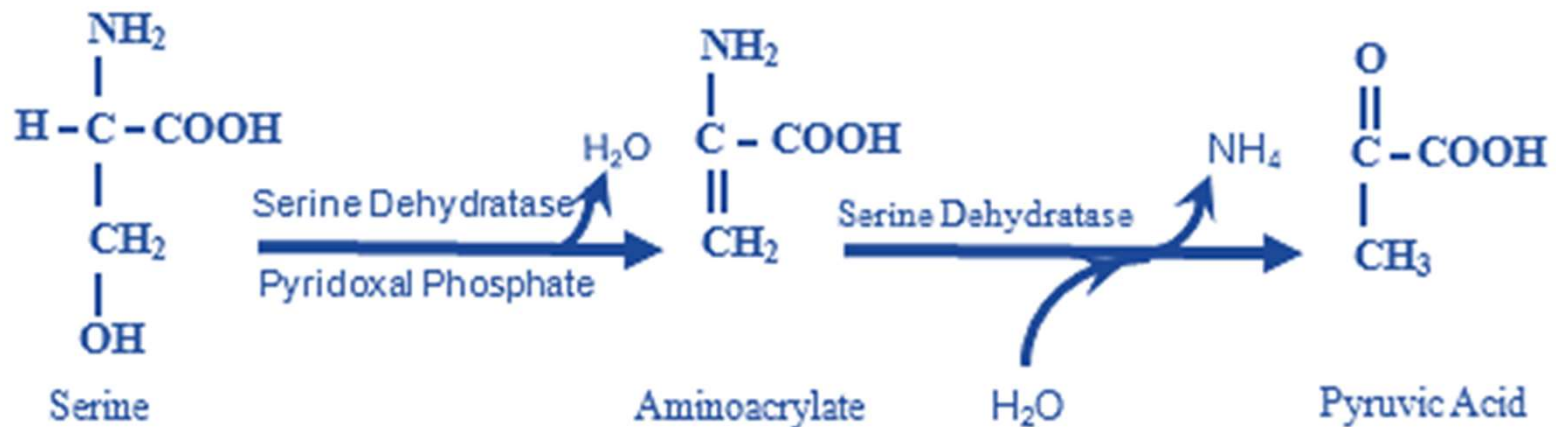


Non-oxidative deamination

Molecular O₂ is non essential.
Occurs mainly in liver.

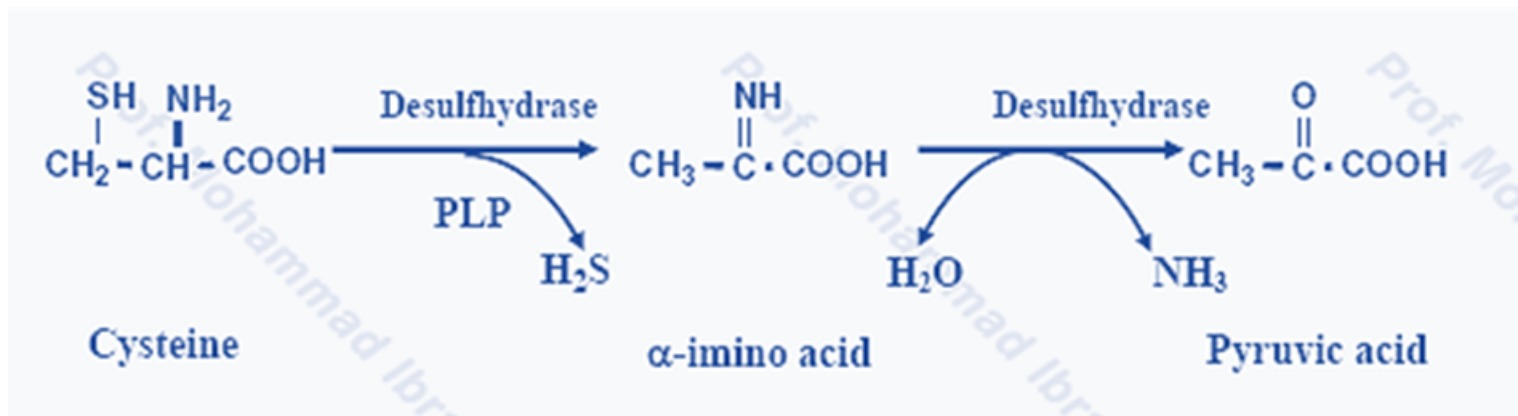
By the help of amino acid dehydratase (serine and threonine), amino acid lyase (histidine and aspartic acid), amino acid desulfhydrase (cysteine), trans-sulfurase (partial deamination, cysteine), amide hydrolase (asparagine).

By the help of
Amino acid dehydratase



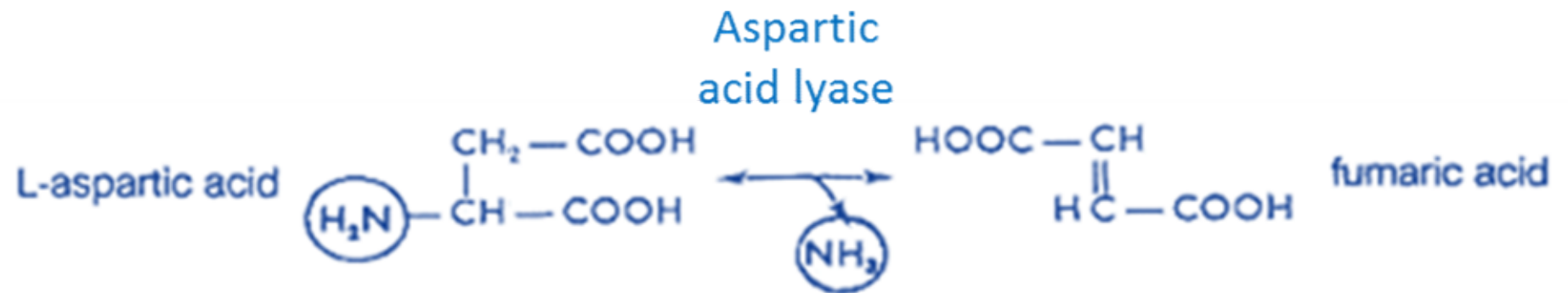
By the help of

Desulfhydrase



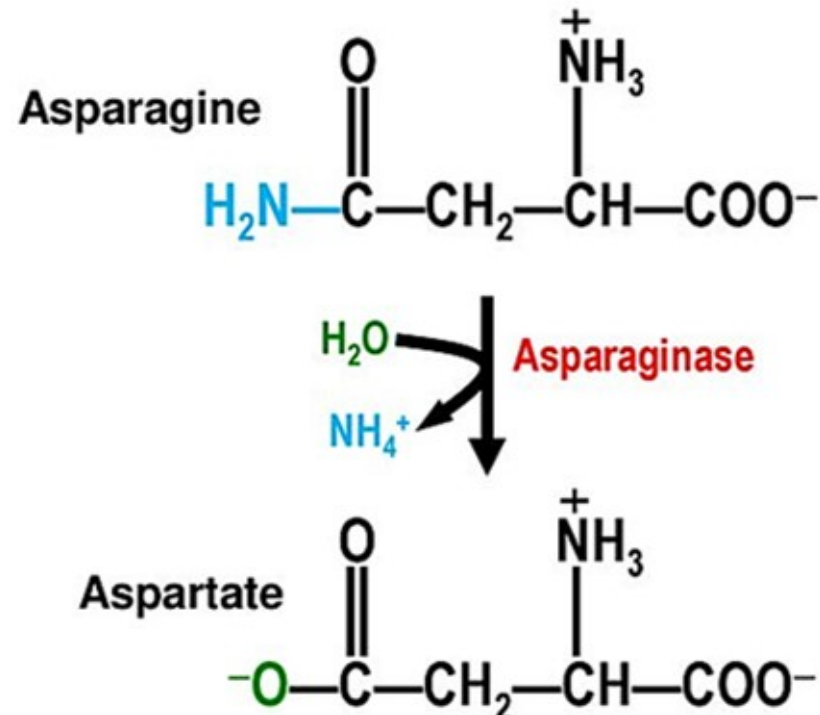
By the help of

Amino acid lyase



By the help of

Amide hydrolase/asparaginase



OXIDATIVE DEAMINATION
VERSUS
NONOXIDATIVE DEAMINATION

OXIDATIVE DEAMINATION	NONOXIDATIVE DEAMINATION
A form of deamination, which generates α -keto acids and other oxidized products from amine-containing compounds	A form of deamination, which liberates ammonia without undergoing oxidation
Only occurs in the liver and kidney	Occurs in other types of organisms
Enzyme: Glutamate dehydrogenase	Main form of enzymes: amino acid dehydratases
Primary type of amino acid: glutamic acid	Hydroxy amino acids including serine, homoserine, and threonine
Coenzymes are responsible for the oxidation reactions	No oxidizing agents Visit www.PEDIAA.com

Significances

- a) Ammonia utilized for → Urea formation
- b) α keto acids for energy
- c) Glutamate accepts amino group from amino acids (Transamination)
- d) **Glutamate –is collection center for amino group oxidative deamination**