



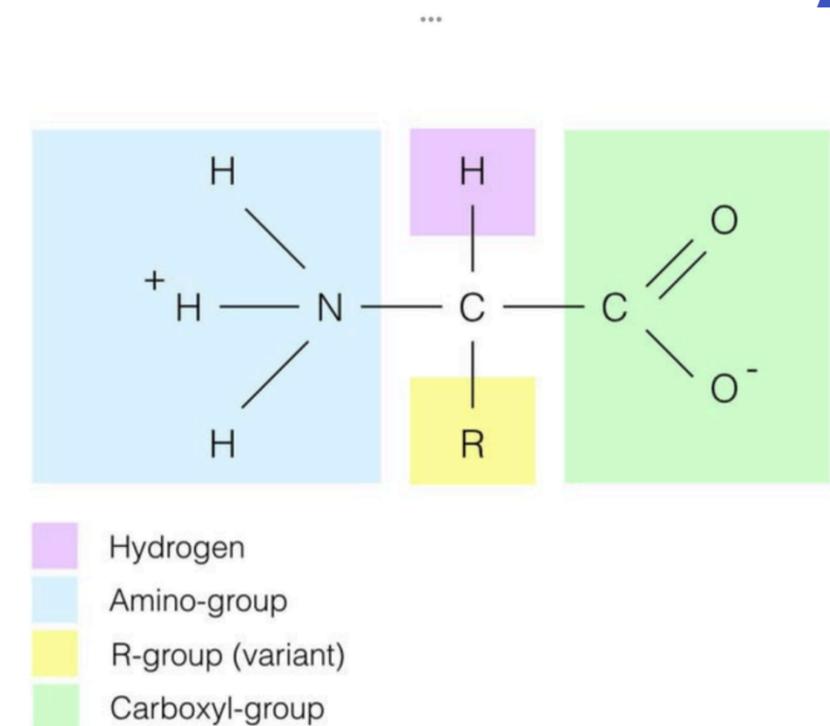
Amino Acid

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MEDICAL BIOCHEMISTRY

Amino Acids

- Amino acids are the building blocks of proteins.
- Each amino acid contains:
 - Amino group (NH₂)
 - Carboxyl group (COOH)
 - Hydrogen atom
 - Side chain (R group)

These groups determine the chemical behaviour of amino acids



Classification of Amino Acids

Amino acids are classified into two types:

1. Essential amino acids
2. Non-essential amino acid

This classification depends on whether the body can synthesize them or not.



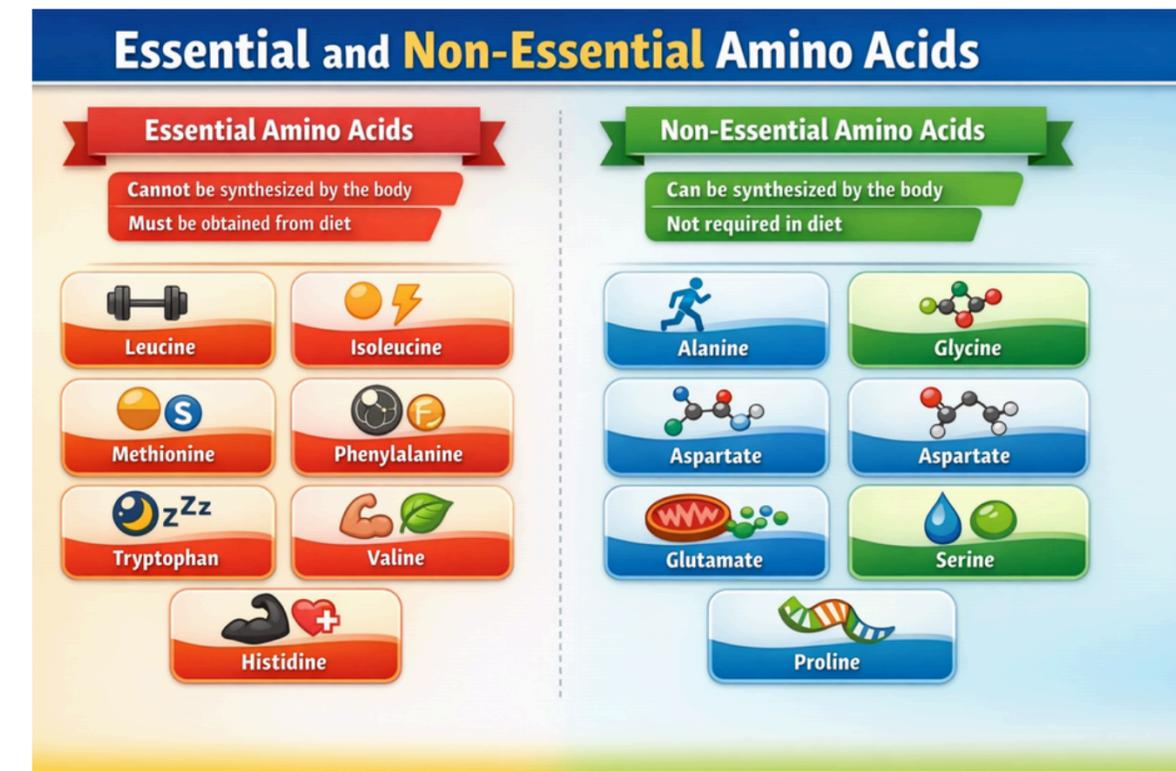
ESSENTIAL AMINO ACIDS

Essential amino acids:
Cannot be synthesized by the body
Must be obtained from diet

Examples:

Leucine
Isoleucine, Lysine
Methionine, Phenylalanine
Threonine, Tryptophan
Valine, Histidine

PVT TIM HLL



NON-ESSENTIAL AMINO ACIDS

Non-essential amino acids:

- Can be synthesized in the body
- Do not need to be obtained from diet

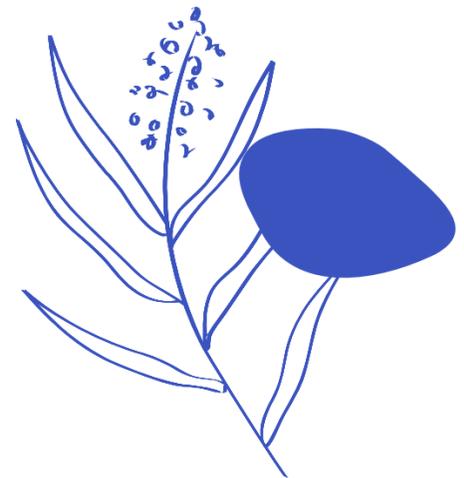
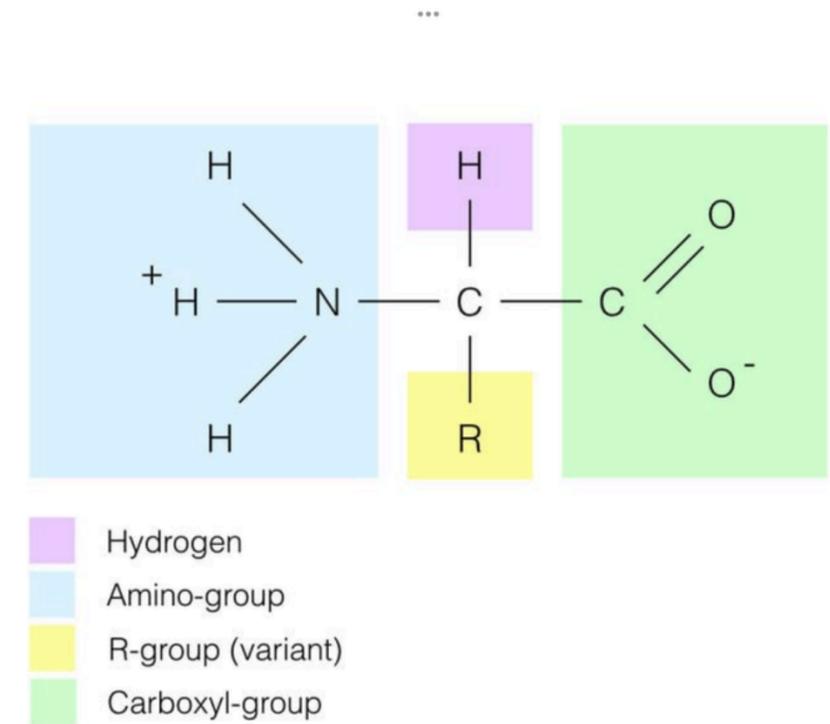
Examples:

- Alanine, Glycine, Aspartate, Glutamate, Serine, Proline

AMINO GROUP

The amino group (NH₂):

- Contains a nitrogen atom
- Has a lone pair of electrons
- Participates in several biochemical reactions





REACTIONS DUE TO THE AMINO GROUP

Important reactions include:

1. Transamination
2. Deamination
3. Formation of carbamino compounds

These reactions are important in amino acid metabolism.



TRANSAMINATION

Definition

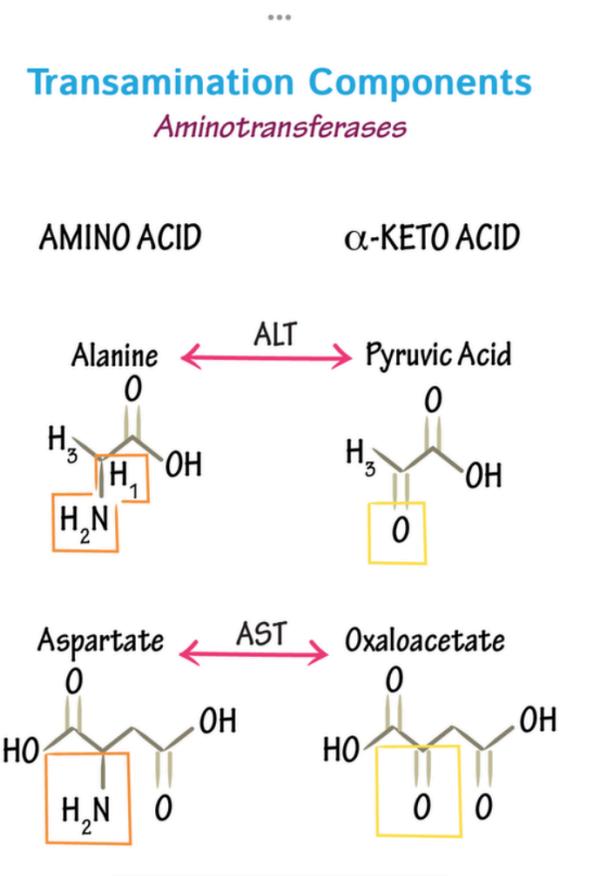
Transfer of the amino group from an amino acid to a keto acid.

General reaction:

Amino acid + α -keto acid

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New amino acid + new keto acid



Enzymes and Cofactor

Transamination requires:

Enzymes:

- Aminotransferases

Examples:

- ALT
- AST

Cofactor: Pyridoxal phosphate (PLP)

Derived from Vitamin B6

Deamination

Definition

Removal of the amino group from an amino acid.

Result:

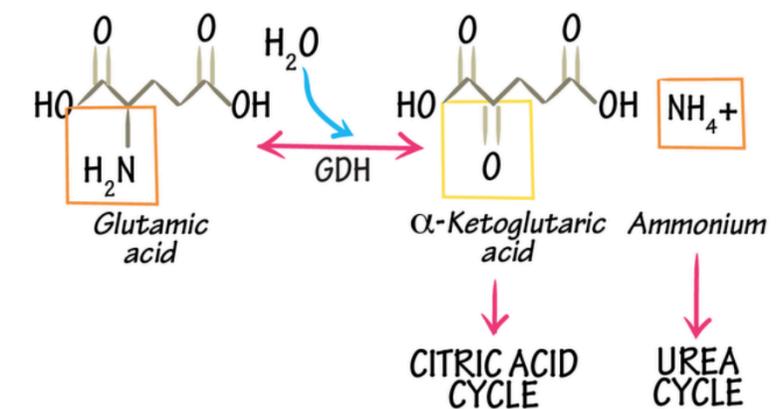
Amino acid

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Keto acid + Ammonia (NH₃), Occurs mainly in the liver.

Oxidative Deamination Components *Glutamate Dehydrogenase*

AMINO ACID KETO ACID WASTE
Glutamate α-Ketoglutarate + Ammonia



Carbamino Compound Formation

Amino groups can react with carbon dioxide (CO₂).

Example:

Hemoglobin + CO₂

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Carbaminohemoglobin

This reaction contributes to CO₂ transport in blood.



**THANK
YOU**