

PROTEINS



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Amino Acids

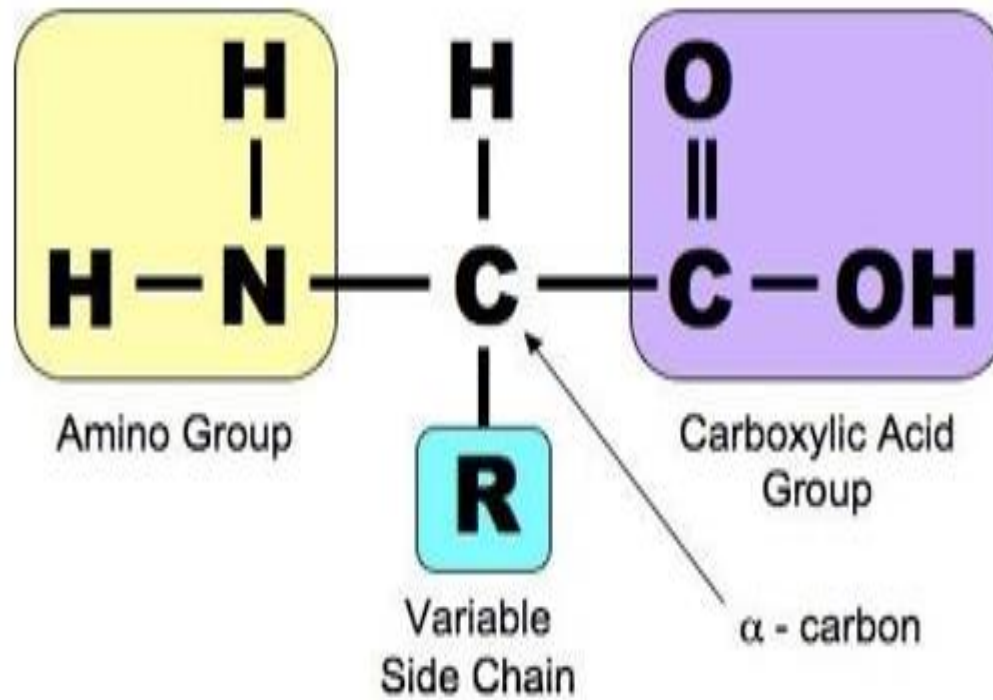
20 of amino acids (**L- isomers**) are commonly found in proteins.

- All amino acids are an **amino (-NH₂)**

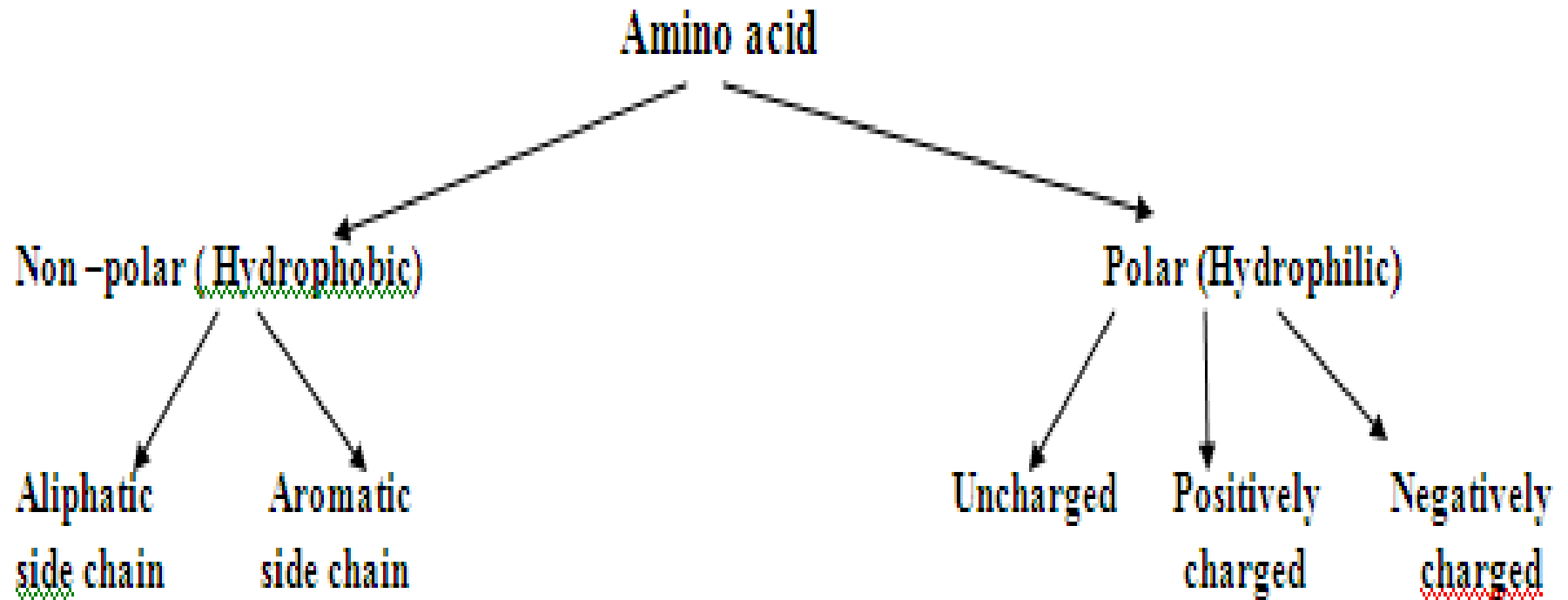
-All 20 of the common amino acids are
***α*-amino acids**

Amino Acids:

The building blocks of proteins



Classification of Amino Acids



Classification of Amino Acids

~~I- Nonpolar, Aliphatic R Groups (7 a.a)~~

Name
Glycine
Alanine
Proline
Valine
Leucine
Isoleucine
Methionine

2- Aromatic R Groups (3a.a)

Name
Phenylalanine
Tyrosine
Tryptophan

3- Polar Uncharged R Groups (5 a.a)

Name
Serine
Threonine
Cysteine
Asparagine
Glutamine

4- Positively charged R Groups (Basic a.a) (3 a.a)

Name
Lysine
Arginine
Histidine

5- Negatively charged R Groups (Acidic a.a) (2 a.a)

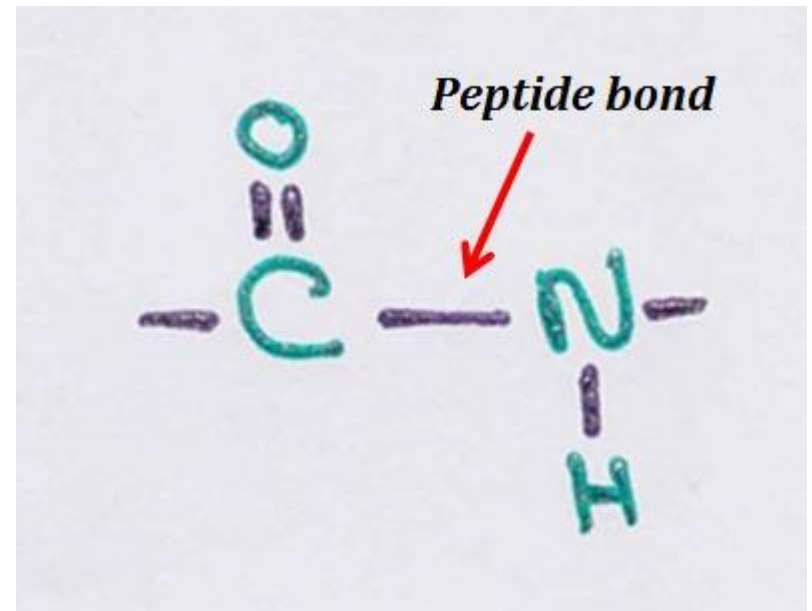
Name
Aspartate
Aspartic acid
Glutamate
Glutamic acid

Peptides

Peptides Are Chains of Amino Acids

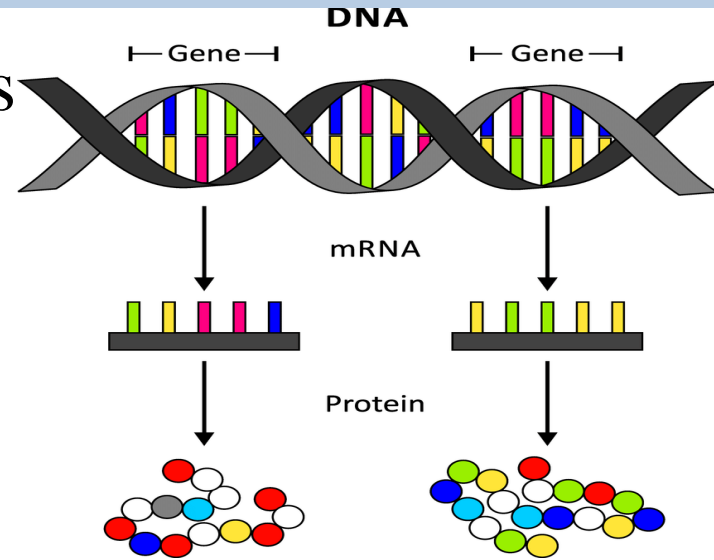
The amino acid units can be joined through a **peptide bond**

Peptides and **Proteins** are polymers of amino acids



Proteins

Proteins are the molecular instruments through which genetic information is expressed.



Proteins are built from 20 simpler compounds called **amino acids**.

- The amino acids in the protein molecule are linked together through **peptide bonds**.

Classification of Proteins

Proteins have been classified in several ways

Based on
Biological Role
(Functions)

1. Catalytic proteins
2. Transport proteins
3. Storage proteins
4. Contractile proteins
5. Structural proteins
6. Defense proteins
7. Regulatory proteins

Based on
Molecular shape

1. Fibrous proteins
2. Globular proteins

Based on Physical
& Chemical
properties

1. Simple proteins
2. Conjugated proteins
3. Derived proteins

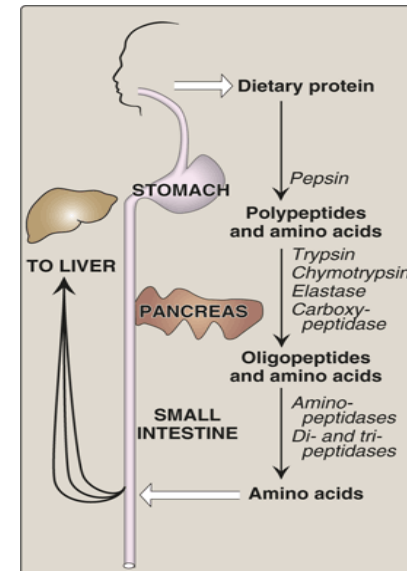
Protein digestion:

- **Proteins** are generally **too large to be absorbed by the intestine**.
- They must be **hydrolyzed** to their constituent **amino acids**, which can be absorbed.

1) Digestion of proteins by gastric secretion(**stomach**)

The **gastric juice** contains two components important for protein digestion:

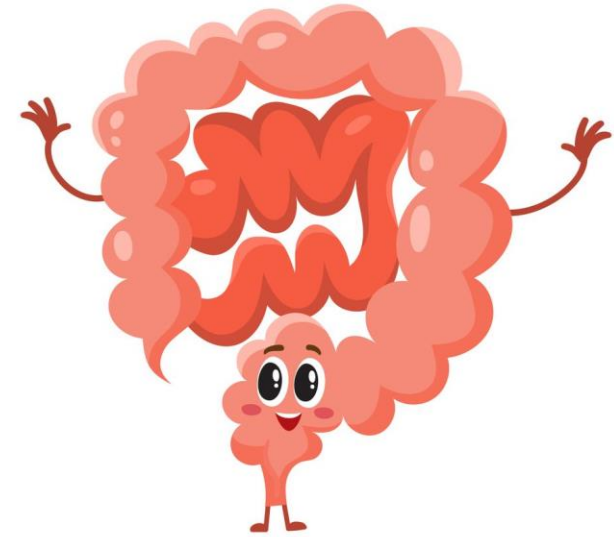
1) Hydrochloric acid (HCL). 2) Pepsin



2) Digestion of proteins in **small intestine**

Digestion by **pancreatic enzymes**.

enzyme
Trypsin
Chymotrypsin
Elastase
Carboxypeptidases



The digestion in small intestine is **hormonally** controlled.

3) Absorption of digested proteins:

amino acids absorption