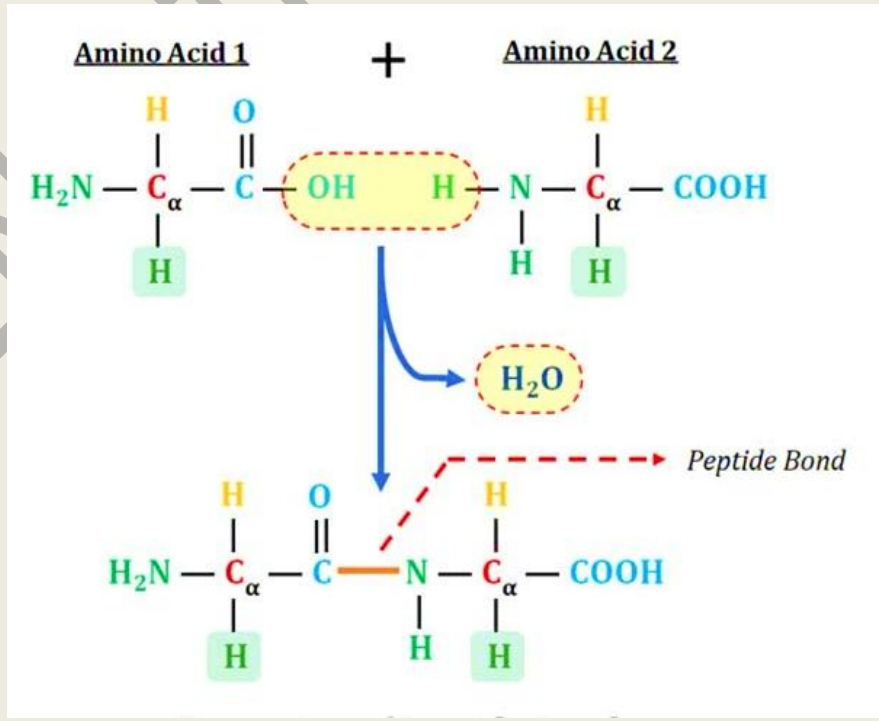
Protein structure

Amino acids are the **structural units (building blocks = الوحدات البنائية) of proteins.**

A specific **sequence**, **number**, and **type** of amino acids are **bonded** together by peptide bonds to form different proteins in our body.



Peptide Bonds:

peptide bond formation is a **condensation** (dehydration) **reaction** *between* an **α-carboxyl group** of **one amino acid** and an **α-amino group** of the **following amino acid** in the polypeptide chain.

Properties of Peptide Bonds :

A.Rigid: There is **NO freedom** of rotation of groups around the bond.

B. Polar and Uncharged

C. Resistant to denaturation: to break a peptide bond ***in vitro***, في المعمل we need to add a **strong acid or strong base and expose it to a high temperature**. However,

in vivo داخل الجسم peptide bonds can be **BROKEN** **by peptidases (proteolytic enzymes).**

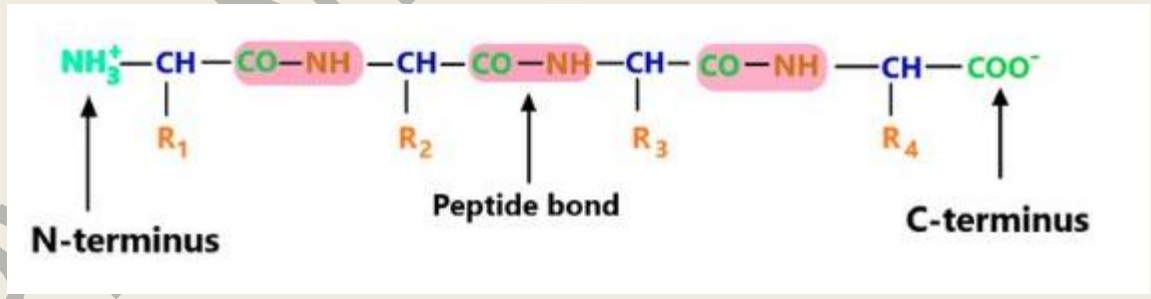
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Peptides

- Are polymers of A.A.s linked by peptide bonds.
- Peptide chain has 2 ends : Amino terminal (N terminal) to the left and marks beginning of the chain And carboxyl terminal (C terminal) to the right and marks the end of the chain

- A dipeptide is formed of two amino acids linked together by 1 peptide bond
- A tripeptide is formed of three amino acids linked together by 2 peptide bonds
- A tetrapeptide is formed of four amino acids linked together by 3 peptide bonds , and so on

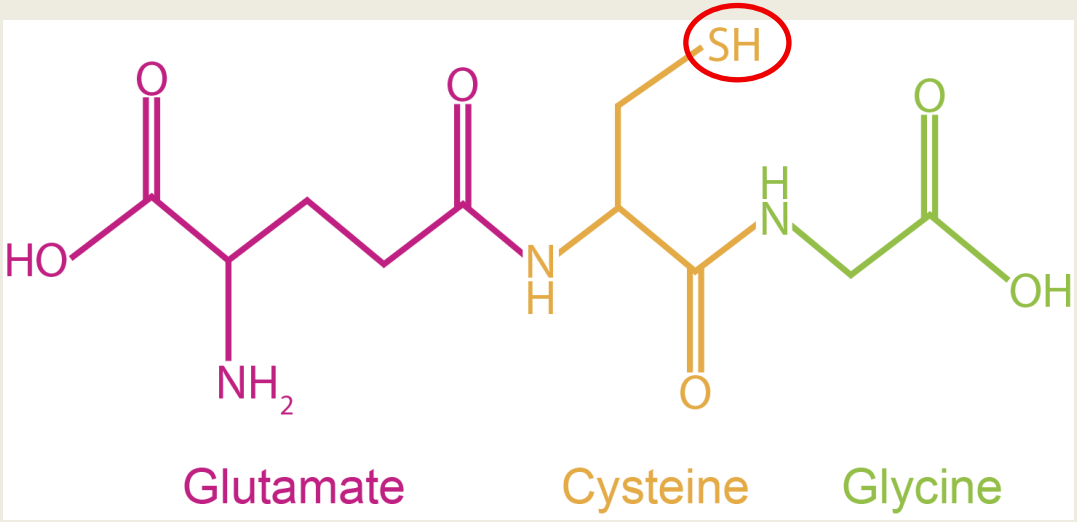
A Polypeptide is un-branched chain of many amino acids residues connected by peptide bonds.



Biologically active peptides: **Short peptide chains (less than fifty amino acid residues)** have specific biological functions

Example : **Glutathione (GSH) :**
A biologically active **tripeptide** that is formed of **glutamate, cysteine, and glycine**

- **It is an important tripeptide acting as reducing agent; Reduce toxic H2O2 into H2O in RBCs; protect the wall of RBCs against hemolysis because of the toxic H2O2.**



BIOCHEMISTRY