

**Topic: Amino Acid(Structure & Classification)**

**Class: B.Sc Part –III (Hons.)**

**Paper- V**

**Group – A**

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# AMINO ACID

- Amino acid: a compound that contains an amino group, a carboxyl group and a side-chain that is specific to each amino acid.
- Amino acid: an amino acid in which the amino group is on the carbon adjacent to the carboxyl group
- • There are 20 common  $\alpha$ -amino acids used by the ribosomes to make proteins. These 20 have L chirality at the  $\alpha$ - carbon.

- The building blocks of proteins
- • 20 amino acids are naturally incorporated into polypeptides and are called proteinogenic or standard amino acids. These 20 are encoded by universal genetic code.
- • 10 standard amino acids (Lys, Met, His, Leu, Ile, Thr, , Try, Phe, Val & Arg) are called "essential" for humans because they cannot be created from other compounds by the human body, and so must be taken in as food.
- • From these building blocks different organisms can make such widely diverse products as enzymes, hormones, antibodies, antibiotics, and a myriad of other substances having distinct biological activities.
- • Also used as single molecules in biochemical pathways
- | H<sub>2</sub>N— C —COOH | H<sub>3</sub>

- **Chemistry of Amino Acids**

- Two functional groups: –

carboxylic acid group

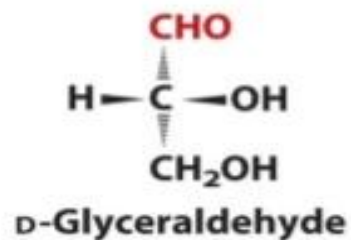
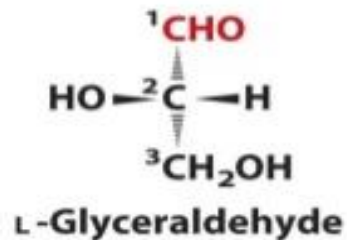
–amino group on the alpha ( $\alpha$ ) carbon

- Have different side groups (R)

–Properties dictate behavior of AAs

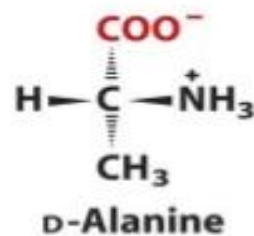
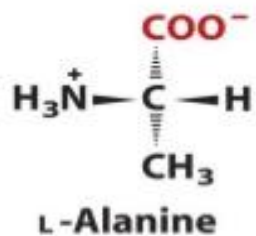
# Stereochemistry of AAs

- All amino acids (except glycine) are optically active (chiral)



2 forms of enantiomers/stereoisomers

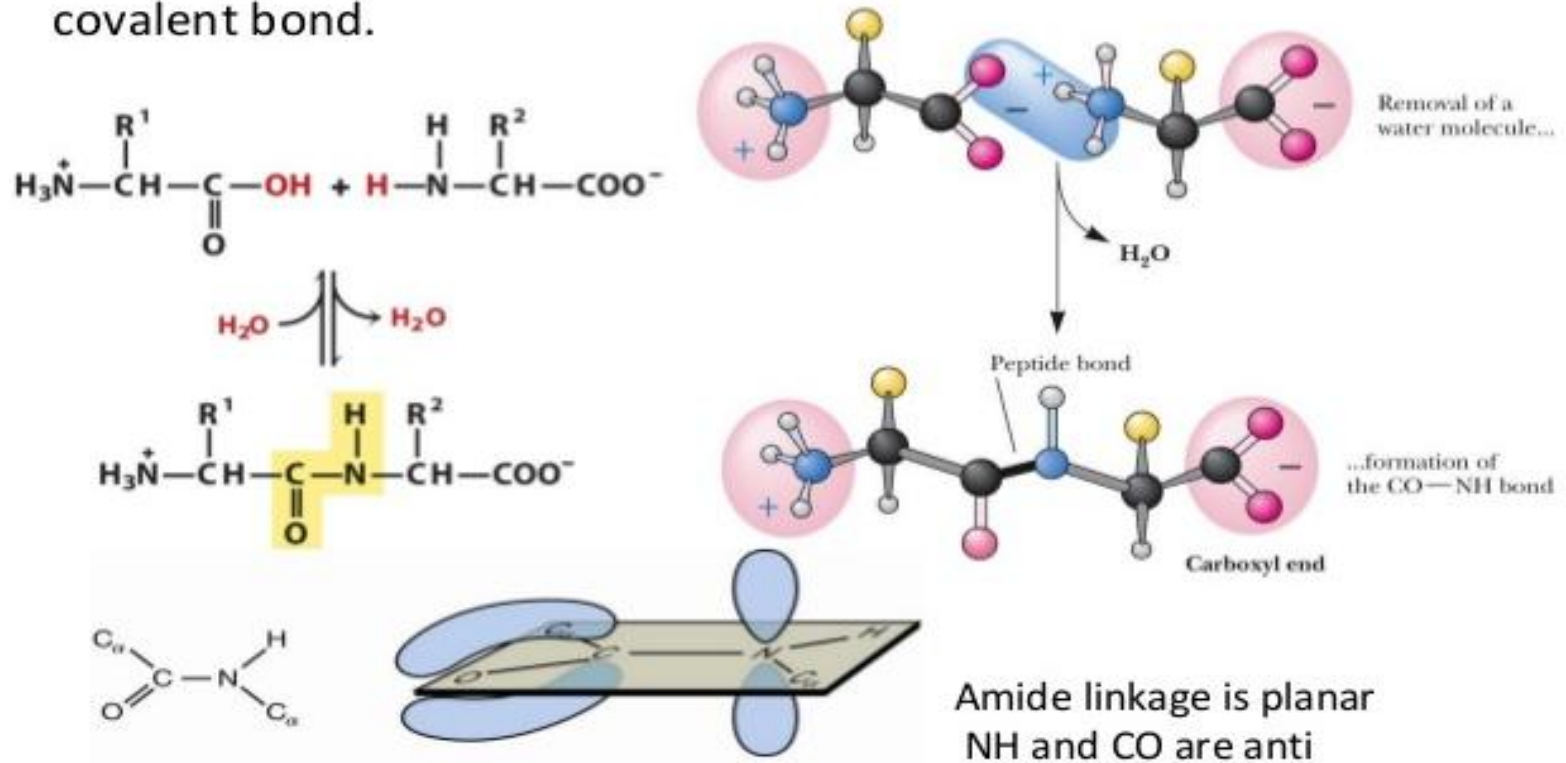
- d* = dextrorotatory, *dextro* means right
- l* = levorotatory, *levo* means left
- D, L = relative to glyceraldehyde



# Amino acids join together via peptide bonds

- Chain of amino acids = peptide or protein

Two amino acids can react with loss of a water molecule to form a covalent bond.



A pure double bond between C and O would permit free rotation around the C—N bond.