

Amino Acids

Biology

The general structure, and what the R group determines.

An amino acid has a central carbon bonded to an amine group, a carboxyl group, a hydrogen and a variable R group. The R group determines the amino acid's chemistry.

STANDARD
20

ESSENTIAL
9

BOND
peptide

- Twenty amino acids are used in protein synthesis.
- Nine are essential in humans — they must come from the diet.
- R groups may be polar, non-polar, acidic or basic.
- Non-polar R groups cluster inside the folded protein.
- Cysteine's R group forms disulfide bridges.
- Peptide bonds form between the amine of one and the carboxyl of the next.

LOOK FOR IT

Sickle cell disease is one glutamic acid replaced by valine — polar swapped for non-polar — in a 146-residue chain.

That single substitution changes the surface chemistry enough to make haemoglobin polymerise, deforming the whole cell.