Amino acid,Protein structure Cheat Sheet

by rhettbro via cheatography.com/133961/cs/27512/

Amino Acids

Amino acids -> Peptide -> Protein

8 Hydrophobic amino acids

Hydrophobic effect: important for protein folding and ligand binding

Hydrophobic effect: maximizing contact with one another -> squeezing out the cage of water that were surrounding the both -> got rid of some waters, going to a HIGHER entropy situation

9 Hydrophilic amino acids

1.Got charge (basic, acidic) 2. Polar group (OH, NH2) (partial charge) (electronegative O and N)

H-bond not only in water, but also in OH group or nitrogen (h-bond donor)

Lots of interactions between polar compound and polar compound, or polar compound and water -> important in basic amino acids

All acidic residues and basic residues can be protonated

pKa: shorthand of showing protonation and deprotonation equilibrium (= -logKa)

If pKa = 4: that compound will be exactly 50% protonated and 50% deprotonated at pH = 4

All side chains will be negatively charged at pH = 7

Histidine is the weakest base among the three basic amino acids	Useful in enzyme catalytic site: to receive and donate protons

Special amino acids

Glycine	without a sidechain,It takes up so little space that it allows tight turns in a folded polypeptide.
Proline	It is an IMINO acid, because the sidechain curls round to rejoin the main chain at the alpha carbon.

Amino Acids (cont)

Cysteine	it's reactive –SH group offers a lot of chemistry and also the possibility of covalent disulphide links, especially in proteins that have to survive in a challenging environment – e.g. digestive enzymes.

Amino Acids

Solubility: Amino acids are soluble in water, acids, alkalies, but sparingly soluble in organic solvents.

Color: Amino acids are colorless, white solids.

State: Amino acids are solid crystalline compounds.

Melting points: Amino acids have high melting points. Due to presence of basic and acidic groups in the same molecule, they may be regarded as salts and hence, most of them either possess higher melting point or melt with decomposition.

Protein Structure

Primary structure

-Ala-Glu-Val-Thr-Asp-Pro-Gly-

Secondary structure

alpha helix, beta sheet

Tertiary structure

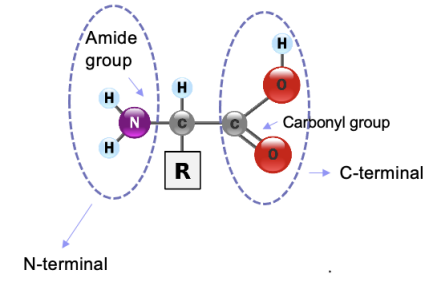
each clump is called a domain

Quaternary structure

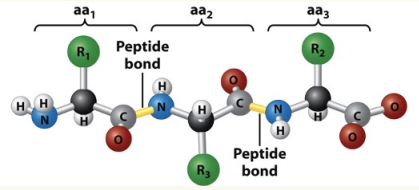
These proteins are referred to as monomeric (1) or oligomeric (several), and more specifically in the case of haemoglobin, tetrameric (4).

Soluble proteins are often able to refold even in vitro.

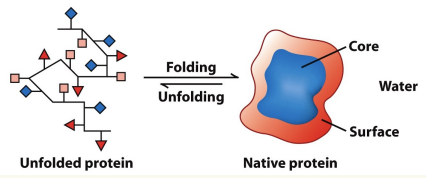
Amino Acids



Peptide



Protein folding



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