

Protein Structure & Function

- (1) Polypeptide is NOT synonymous with Protein
- (2) Globular (spherical) Proteins
Fibrous Proteins (long fibres) } two categories
- (3) Form & Function
 - antibodies
 - endorphin receptors
- (4) Quaternary only if composed of more than one polypeptide chain
- (5) Hydrogen bonds of secondary structure are NOT between the side chains (R-groups) but rather the polypeptide backbones.
- (6) α -keratin - hair - helix over whole length
- (7) β pleated sheets $\Rightarrow$ globular and fibrous (silk)

(8) Tertiary structure - interactions of side chains

- hydrogen bonds between side chains
- hydrophobic "clustering" in middle
- VDW's
- ionic bonds between side chains
- Disulfide bridges S - S

PS7 diagram

- (9) Q-structure
- collagen (40% of human protein)
- hemoglobin (4 polypeptides)

(10) sickle-cell - one substitution in primary structure.

(11) DENATURATION

- pH
 - salt
 - temp
- > affect protein structure

↳ fevers can de-nature proteins in blood.

(12) MISFOLDED PROTEINS $\Rightarrow$ DISEASE - Alzheimer's, Parkinson's

(13) X-ray crystallography
NMR spectroscopy.

NUCLEIC ACIDS

(1) monomers are nucleotides

(2) m RNA
~ RNA
* RNA

(3) DNA $\Rightarrow$ RNA $\Rightarrow$ protein

(4) ribosomes (in cytoplasm) are site of protein synthesis

(5) NUCLEOTIDE

Nitrogenous base

5 carbon sugar - a pentose

phosphate group

nucleoside

(6) Pyrimidines

- one ring
- Cytosine and Thymine - uracil in RNA

Purines

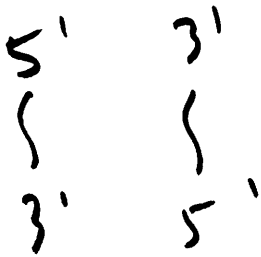
- 2 rings
- Adenine and Guanine

(7) Deoxyribose in DNA - lacks an O on the second carbon
see p 61 diagram on right

5' carbon with Phosphate group attached



3' carbon with -OH attached



Anti-parallel

(8) Double helix

(9) A - T
C - G

in DNA

base pairing rules

A - U

in RNA