Protein Structure & Function

(1) Polypeptide is NOT synonymous with Protein

(2) Globular (spherical) Proteins
Fibrous Proteins (long fibers) } broad 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 ⇒ globular and fibrous (silk)

(8) **Testing 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

p 57 diagram

(9) Q- structure
- collagen (¼ 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 ⇒ Disease - Alz, Parkinson's

(13) X-ray crystallography
NMR spectroscopy.

NUCLEIC ACIDS

(1) monomers are nucleotides

(2) mRNA
rRNA
tRNA

(3) DNA ⇒ RNA ⇒ 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

5' 3'
((
3' 5'

Anti-parallel

(8) Double helix

(9) A – T
C – G
in DNA

base pairing rules A – U
in RNA