Proteins (7.5)

Explain the levels of protein structure (7.5.1)

Primary Structure:

- The order of amino acid sequence
- Held together by peptide bonds

Secondary Structure:

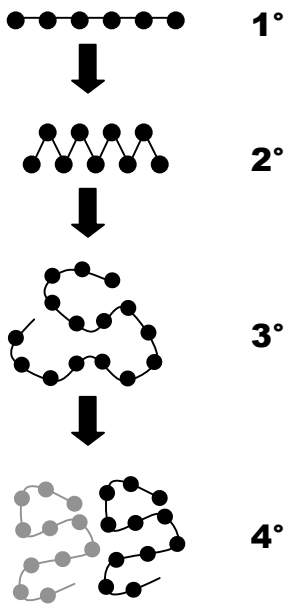
- The way the amino acid chain folds (α-helix / β-sheet)
- Held together by hydrogen bonds between non-adjacent C-O and N-H groups

Tertiary Structure

- The 3-dimensional shape of the polypeptide chain
- Held together interactions between R groups

Quaternary Structure:

- The interaction between multiple polypeptides or prosthetic groups to form a biologically active protein



Explain the significance of polar and non-polar amino acids (7.5.3)

Polar amino acids:

- Are hydrophilic (water-loving)
- Can make hydrogen bonds
- Found on the surface of most water-soluble proteins (i.e. most globular proteins)
- Found on the inner lining of protein channels (allows passage of polar molecules)

Non-polar amino acids:

- Are hydrophobic (water-hating) but lipophilic
- Forms van der Waals / hydrophobic interactions with other hydrophobic amino acids
- Found on interior of water-soluble proteins
- Found on surface of integral membrane proteins and most fibrous proteins

Fibrous versus globular proteins (7.5.2)

Properties	Fibrous Protein	Globular Protein
Sequence	Repetitive	Irregular
Shape	Long and narrow	Rounded
Role	Structural	Functional
Main level of organisation	2° structure	3° structure
Solubility (in water)	Usually insoluble	Usually soluble
Examples	Collagen, keratin, myosin, actin, fibrin	Insulin, hemoglobin, amylase, histone

Functions (7.5.4)

Remember: **SHED IT**

Structure *(collagen)*

Hormone *(insulin)*

Enzyme *(amylase)*

Digestion *(trypsin)*

Immunity *(antibody)*

Transport *(hemoglobin)*