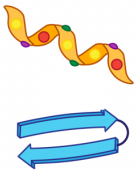
CONCEPT: SUMMARY OF PROTEIN STRUCTURE

- Proteins are very complex molecules with four levels of structural organization.

Summary of Protein Structure

Structure Level	Characteristics	Stabilized By
Primary 	• _____ of amino acid.	• _____ bonds.
Secondary 	• _____ arrangement of polypeptide chain.	• H-bonds between _backbone_ atoms.
Tertiary 	• Overall shape of the _____ polypeptide chain.	• ___ non-covalent interactions and ___ covalent bond. 1) Hydrophobic & 2) _____ interactions 3) ___-bonds 4) Salt bridge 5) _____ bridge
Quaternary 	• Association of 2 or more _____.	• Same interactions as in ____ structure.

EXAMPLE: Determine whether each of the following statements describes the primary, secondary, tertiary, or quaternary structure of a protein.

_____ a) Side chains interact to form disulfide bonds.

_____ b) Peptide bonds join amino acids in a polypeptide chain.

_____ c) Two polypeptide chains are held together by hydrogen bonds.

_____ d) Hydrogen bonding between amino acids in the same polypeptide gives a coiled shape to the protein.

CONCEPT: SUMMARY OF PROTEIN STRUCTURE

PRACTICE: Determine which of the following statements describes a tertiary structure of a protein.

a) Three polypeptide chains interact to form a biologically active protein.

b) Hydrogen bonds form between adjacent segments of the backbones of the same protein to form its creased structure.

c) Nonpolar side chains are repelled by water and move to the interior of the protein.

d) Amino acids react in a condensation reaction to form a peptide bond.

PRACTICE: Indicate whether each of the following statements describes a primary, secondary, tertiary, or quaternary protein structure:

_____ a) Hydrophobic R groups seeking a nonpolar environment move toward the inside of the folded protein.

_____ b) Protein chains of collagen form a polypeptide chain composed of 3 alpha helices.

_____ c) An active protein contains 4 tertiary subunits.

_____ d) Two polypeptide chains held together by disulfide bridges.