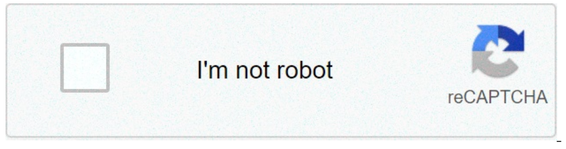

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The secondary structure of proteins is

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Understanding:â¢ The sequence and number of amino acids in a polypeptide is the primary structure Primary (1o) Structure The first level of structural organization in a protein is the order/sequence of amino acids that make up the polypeptide chain The primary structure consists of covalent peptide bonds between amine groups and carboxyls of adjacent amino acids Primary structure controls all successive levels of protein organization because it determines the nature of the interactions between R groups of different amino acids Understanding:â¢ The secondary structure is the formation of Î±-helices and Î2-pleate sheets stabilized by hydrogen bonding Secondary (2o)) Structure The secondary structure is the way a polypeptide bends into a repetitive arrangement to form Î±-helices and Î2-pleated sheets This folding is a result of hydrogen bonding between amine groups and carboxyls of non-adjacent amino acidsSequences that do not form an alpha sheet elix or beta-pleated will exist as a random coilThe secondary structure provides the polypeptide chain with a level of mechanical stability (due to the presence of hydrogen bonds) In the pictures, the alpha helices are represented as spirals (taple; right arrow) Understanding:â¢ The tertiary structure is the further fold Polypeptide stabilized by interactions between R groups Tertiary (3o) Structure Tertiary structure is the way in which the coils of the polypeptide chain transform into a complex molecular shape (i.e. the 3D shape) is caused by interactions between R groups; including H-bonds, disulfide bridges, ionic bonds and hydrophobic interactionsRelative amino acid positions are important (e.g. non-polar amino acids usually avoid exposure to aqueous solutions) Tertiary structure can be important for protein function (e.g. specificity of the active site in enzymes) Understanding:â¢ Quaternary structure exists in proteins with more of a Quaternary polypeptide chain (4o) StructurePolypeptides or protein groups can interact to form a single, larger, biologically active protein (quantitative structure) A prosthetic group is an inorganic compound involved in the structure or function of proteins (e.g. the heme group in hemoglobin) A protein containing a prosthetic group is called a conjugated proteinQuaternary structures can be held together by a variety of bonds (similar to the tertiary structure) Summary of the Four Levels of Protein Structure Tutorial to help answer the question The tertiary structure of a protein refers to: A. Amino acid sequence B. Presence of alpha-elices or beta-sheets C. Unique three-dimensional folding of the molecule D. Interactions of a protein with other enzyme subunits E. Interaction of a protein with a nucleic acid Tutorial Describe the Protein in terms of 4 different aspects of the covalent structure and folding models. The different different The protein structure is known as the primary, secondary, tertiary and quaternary structure. Primary structure of protein The primary structure is the sequence of amino acids that constitute a chain of polypeptidic. 20 different amino acids are found in proteins. The exact order of amino acids in a specific protein is the primary sequence for that protein. The secondary structure of the secondary structure of proteins refers to regular and repeated patterns of protein spine folding. The two most common folding models are the Helix alpha and beta sheet. Alpha Helix In an alpha helix, the backbone of the polypeptide approaches an imaginary helix axis clockwise. In this illustration, only the N-C-Co backbone atoms are shown. Note the plating of the spine around an imaginary axis along the center of the propeller. Beta Sheet In the secondary structure of the beta sheet, the backbone of the polypeptide is almost completely extended. R groups (not shown) are alternately pointed over and then under the extended spine. The tertiary structure of the tertiary structure of proteins refers to the overall bending of the entire polypeptidic chain in a specific 3D form. The tertiary structure of enzymes is often a compact and globular form. Tertiary structure of the molecule of Triose Fosphate Isomerase (TPI). Quaternary structure of proteins Many proteins are formed by more than one polypeptidic chain. The quaternary structure describes how different subunities are packed together to form the general structure of the protein. For example, the human hemoglobin molecule shown below is composed of four subunits. The Biology Project Department of Biochemistry and Molecular Biophysics The University of Arizona has reviewed: October 2004 Contact the development team BiopharmaSpec Ltd Suite 3.1, Lido Medical Center St. Salvatore, Jersey JE2 7LA, UK Tel: +44 (0) 1534 483493 Fax: +44 (0) 1534 483494 Biopharmaspec Inc 363 Phoenixville Pike Malvern, PA 19355 USA Tel: +1 610 -640-5866 Fax: +1 610-640-5773 Levels of protein organization 2014 Medical Foundations ELAB The primary structure of a protein is defined as the sequence of amino acids of its polypeptidic chain; The secondary structure is the local spatial arrangement of the spine of a polypeptide (main chain) atoms; The tertiary structure refers to the three-dimensional structure of an entire polypeptidic chain; and the quaternary structure is the three-dimensional disposition of subunits in a multisubunit protein. In this series of pages we examine the different levels of protein organization. We also see structures in many ways - dorsal cî ±, ball and sticks, cpk, tape, spacefilling - also color is used fordifferent aspects of amino acids, structure, etc. When you have gone through this form, please note these aspects. This module includes links to kings (cinemavia, next generation), which displays three-dimensional structures in a Interactive format. These "kinemages" (kinetic images) can be rotated, moved, and enlarged, and the parts can be hidden or shown. Kinemages was initially implemented under the auspices of Innovative Technology Fund and the Society Protein, and the programming and maintenance are made by David C. Richardson and Jane S. Richardson. Reference: "The Kinemage: scientific communication tool" in DC, Richardson and J.s. Richardson (1992) Protein â €