

Chapter 6 Chapter questions
Proteins: Three Dimensional Structure

Study exercises 1, 3, 4, 5, 7, 11, 12, 13 and chapter problems 4, 5, 6, 8, 9.

- 1) What is it about the peptide backbone that allows it to form defined secondary structures?
- 2) Explain why glycine occurs every 3rd residue in a collagen helix .
- 3) A primary structure of a protein
 - a) Is the association of proteins with its subunits
 - b) Is the linear sequence of amino acids
 - c) Is the ordered structure of peptide backbone such as an α helix or a β pleated sheet
 - d) Is detected only by a polyclonal antibody
 - e) None of the above
- 4) The force stabilizing the alpha helix is?
 - a) Hydrogen bonds in the nearby chains
 - b) Hydrogen bonds in the same chain
 - c) Salt bridges
 - d) The decrease in entropy of water
 - e) Water under the bridge
 - f) Disulfide bonds between cysteines
 - g) Hydrophobic interactions
- 5) The proline limits the phi and psi bonds possible in an alpha helix. This is due to?
 - a) The increase in flexibility of the peptide bond
 - b) The small size of proline R group
 - c) The cyclic nature of the side group of proline
 - d) The decreased steric hindrance due to the small side group of proline
- 6) A gene is mutated such that the amino acids glycine and alanine are now glutamate and leucine respectively. What are the potential results of each of these mutations? Assume that the mutations are not near each other in the primary sequence.
- 7) A protein that is normally an alpha helix at low pH is distorted and curves or bends at a neutral and higher pH. Why? The only unique feature about the primary sequence is that every fourth amino acid is glutamate.
- 8) A secondary level of protein structure
 - a) Is the linear sequence of amino acids
 - b) Is the association of proteins with its subunits
 - c) Is the ordered structure of amino acids such as an α helix or a β pleated sheet
 - d) Is detected only by a polyclonal antibody