

Keypoints Amino Acids and Proteins

Definitions

You will not be asked to write a definition of any of these but I do expect you to recognize them when they are used in problems, etc.

α -helix
Achiral
Acidic Side Group
Amino Acid
Amino Acid R Group (or Amino Acid Side Group)
 β -pleated Sheet
Basic Side Group
Chiral
Conjugated Protein
Denaturation
Denatured Protein
Disulfide Bond (or -S-S- bond)
Hydrogen Bonds
Hydrophilic Interactions
Hydrophobic Interaction
Nonpolar Side Group
Peptide
Polymer
Polar Side Group
Primary Protein Structure
Protein
Quaternary Protein Structure
Salt Bridge (Ionic Interaction)
Secondary Protein Structure
Tertiary Protein Structure

Concepts

1. When given a line structure of an amino acid be able to categorize it as having a basic side group, an acidic side group, or a side group that is neither of these. (You should not memorize these. If there is a -COOH in the side group it is acidic. If there is a nitrogen atom in the side group it is basic, except for histidine.)
2. Be able to predict what an amino acid will predominate a high, middle, and low pHs.
3. Be able to tell whether or not a carbon atom in a molecule is chiral or achiral.
4. Be able to give examples of proteins that are enzymes, structural proteins, transport proteins, and hormones.
5. Be able to define primary, secondary, tertiary, and quaternary structure of proteins.

6. Be able to describe the type of interactions between amino acids and proteins that give rise to primary, secondary, tertiary, and quaternary structure of proteins.
7. Be able to describe the difference between the hydrogen bonding that forms secondary structure and that that is used in tertiary structure.
8. Be able to explain how different types of intermolecular interactions stabilize the structure of proteins.
9. Be able to give the instance in which covalent bonds help determine tertiary and quaternary structure of proteins. (Giving a type of interaction and not a specific protein is fine)
10. Be able to explain what happens when a protein is denatured. (Does it retain quaternary structure but lose secondary structure?)
11. Be able to describe how heat, strong bases, and detergents can be used to denature proteins.
12. Recognize that proteins are polymers of amino acids.
13. Be able to describe how amino acids are linked together to form peptides.
14. When given a short polypeptide be able to identify the amino acids that make up the polypeptide.
15. Be able to explain how a change in the overall fold of a protein can be changed by the environment of the protein.
16. Be able to explain how a change in the primary structure of a protein can lead to an overall change in protein structure.
17. When given a chart that identifies amino acids as polar or non polar be able to describe the types of interactions likely to occur between these amino acids that will hold them together.
18. Be able to predict whether or not you expect to find a type of amino acid side group on the inside or outside of a protein.