

Chapter 5-Part 2
Overhead Notes

I. Proteins

- **Proteins have many structures, resulting in a wide range of functions.**

I. Proteins

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I. Proteins

- **Polypeptide chains** = Polymers of amino acids.
- **Protein** = One or more *polypeptide chains* folded into a specific conformation.

II. Amino Acids

Amino acids = monomer unit of a protein

- 1.
- 2.
- 3.
- 4.
- 5.

- 20 different amino acids

II. Amino Acids

A.

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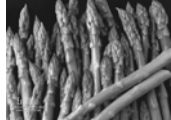
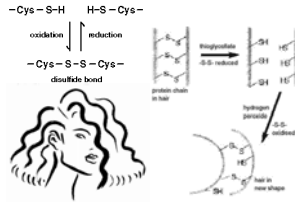


II. Amino Acids

B. Polar side groups (hydrophilic).

1.

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II. Amino Acids

B. Polar side groups

2.

- Acidic side groups;
(-) charge

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II. Amino Acids

B. Polar side groups

2.

- Basic side groups;
(+) charge

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III. Amino Acid Polymers

- Amino acids are covalently linked to form a polypeptide chains.

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IV. Determining the amino acid sequence of a polypeptide.

- The amino acid sequences were first determined using chemical means.
- Can now be determined by automated machines

Question 5.5: A small polypeptide is nine amino acids long. Using different enzymes to hydrolyze the polypeptide, we obtain the following five fragments (N = amino terminus):

Ala-Leu-Asp-Tyr-Val-Leu
Tyr-Val-Leu
N-Gly-Pro-Leu
Asp-Tyr-Val-Leu
N-Gly-Pro-Leu-Ala-Leu

- a)
- b)
- c)
- d)

V. Protein Conformation

- **Native conformation** =

- Two models for protein conformation

VI. Four Levels of Protein Structure

- A. Primary structure (1°)**
- B. Secondary structure (2°)**
- C. Tertiary structure (3°)**

When a protein has two or more polypeptide chains, it also has:

- D. Quaternary structure (4°)**

A. Primary (1°) Structure

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A. Primary (1°) Structure

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B. Secondary (2°) Structure

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-

B. Secondary (2°) Structure

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C. Tertiary (3°) Structure

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1. Weak Interactions

- H-bonds
- Ionic bonds
- Hydrophobic interactions

2. Covalent Linkages

Disulfide bonds (bridges)

C. Tertiary (3°) Structure

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Question 5.6

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D. Quaternary (4°) Structure

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D. Quaternary (4°) Structure

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– **Involves the same weak and covalent interactions found in 3° structure**

VII. Protein Conformation can be disrupted.

• Denaturation =

• Renaturation =

VII. Protein Conformation can be disrupted.

Heat Denaturation

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Question 5.7

- Heat denaturation effects the weak bonds that hold proteins together and can cause permanent brain damage in a person running a high fever for extended periods.
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- A.
- B.
- C.
- D.
- E.
- F.

VIII. Nucleic Acids (polymers)

Two types:

1. Deoxyribonucleic Acid (DNA)
2. Ribonucleic Acid (RNA)

IX. Nucleotides (monomers)

Structure:

- 1.
- 2.
- 3.

IX. Nucleotides (monomers)

Function:

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