

BIOLOGICAL FRAMEWORKS FOR ENGINEERS

Session #5a [nm: Protein Form]

General Objectives:

- ✓ Discuss general functions of proteins and diversity in subunits within the biopolymer
- ✓ Overview of protein structures with respect to their function

Central Framework:

- ✓ A protein is a complex, high-molecular-weight, organic compound that consists of amino acids joined by peptide bonds and is essential to the structure and function of living cells.

Interactive Activity:

- ✓ Worksheet on the relationship between DNA and proteins.

Session Outline:

I. Protein Definition

II. Protein Form and Function

III. The weak can be strong if there are many...

Ionic bonds

Hydrogen bonds

Hydrophobic bonds

van der Waals

IV. Amino Acids form Polypeptides

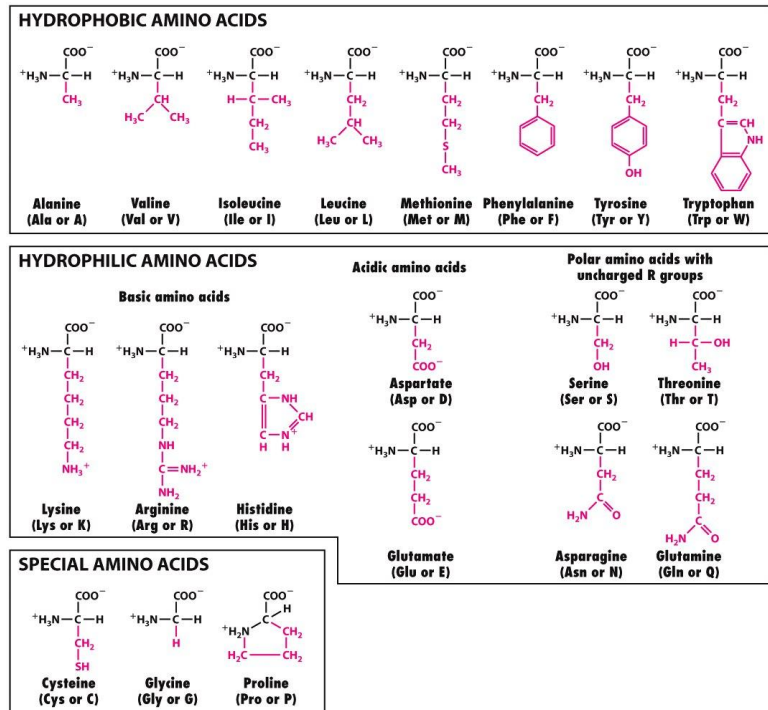


Figure 2-14
Molecular Cell Biology, Sixth Edition
 © 2008 W. H. Freeman and Company

V. Structure of Proteins

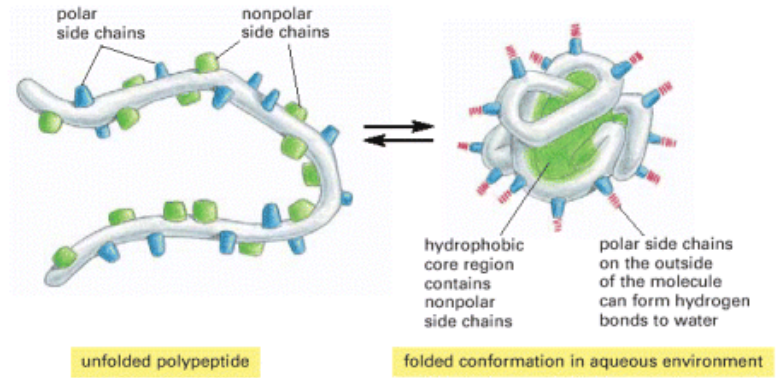
Primary structure:

Secondary structure:

Tertiary structure:

Quaternary structure:

VI. Protein Folding



Spontaneous Folding

Assisted Folding

VII. Post translational modifications

WORKSHEET: DNA Sequence to Protein Function

What is the relationship between:

- a. DNA sequence in a gene and amino acid sequence?
- b. amino acid sequence and structure?
- c. protein structure and protein function?
- d. DNA sequence in a gene and protein function?