Peptide Bonds

Biochem 4511

Figures: Essentials of Biochemistry, 3rd Ed. OSU Custom Edition
Principles of Biochemistry 5th Ed., Moran *et al.*
Lehninger Principles of Biochemistry 5th Ed., Nelson & Cox
Fundamentals of Biochemistry 2nd Ed., Voet, Voet & Pratt

Proteins as Macromolecules

- 1780s: Substances isolated from natural sources that seemed to contain nothing but carbon, hydrogen, nitrogen, and oxygen… and sometimes phosphorus and sulfur

- Protein chemistry until mid-1800s: elemental analysis to try to figure out what these things all had in common!

- Gerrit Mulder (1837): analyzes "albumins" from several sources; declares them to contain (as a minimal unit) $C_{400}H_{620}N_{100}O_{120}$ (8600 Da in today's units), plus assorted other groups

- Meaning of this: **Proteins are very big.**

Peptide Bond Formation

- Practice drawing the peptide TEST using the amino acid line structure drawing rules you have learned:

Restraints on Local Protein Structure

C_α – CO – NH – C_α – CO – NH – C_α

ψ ϕ ψ ϕ

ϕ = Phi

ψ = Psi

In this figure, ϕ = ψ = 180°
"extended conformation"

- Free rotation is limited to the NH-C_α (ϕ) and C_α-CO (ψ) bonds
- The angles around these bonds are known as "dihedral" or "torsion" angles