Amino acids are the building blocks of proteins

Peptide bond formation

Protein Structure

Primary structure

Secondary structures = alpha helix or beta sheet

Tertiary

Quaternary
Protein Basics

Protein Denaturation

heat, pH, oxidation, mechanical agitation

Protein functions

structural, mechanical
transport
enzymes
channels, pumps
hormones
acid-base balance
fluid balance

Proteins in the Diet

• Protein quality
  – Complete proteins
    • supply all essential amino acids
    • animal proteins, soy proteins
  – Incomplete proteins
    • low in one or more essential amino acids
    • most plant proteins
  – Complementary proteins
    • 2 incomplete proteins = complete protein

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Recommended protein intake

Convert weight to kilograms
(pounds ÷ 2.2)
Multiply kg x 0.8 = protein RDA in g
About 15% caloric intake

average man = 58 g
average woman = 46 g
Americans' average actual intake = 75 g daily!

Proteins in the Body

Protein digestion

<table>
<thead>
<tr>
<th>Where</th>
<th>Digestive enzyme</th>
<th>Source of enzymes</th>
<th>Digestive products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stomach</td>
<td>HCl pepsinogen</td>
<td>variety!</td>
<td>denatured proteins, AAs, oligo- and polypeptides</td>
</tr>
<tr>
<td>Small intestine</td>
<td>variety!</td>
<td>Pancreas, Microvilli</td>
<td>AAs, oligo- and polypeptides, tripeptides, dipeptides, AAs</td>
</tr>
</tbody>
</table>
Protein absorption