

3° Structure

3° Structure- Global 3-D shape

How are the 2° structures arranged in relation to each other?

3° Structure

Huge (∞) number of possible structures

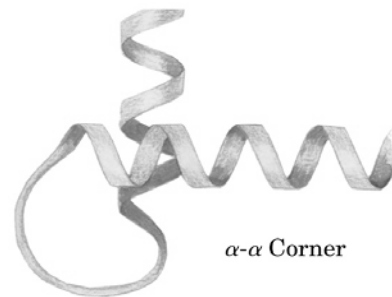
Generalizations:

1. interior hydrophobic, exterior hydrophilic
2. form follows function: *motifs*

Predicting 3° Structure:
The Shape of About 6,000 Proteins
has been Determined by X-ray
Crystallography

Movie clip

The Helix-Loop-Helix Motif



Predicting 3° Structure

More than 500,000 proteins have been sequenced

Computers allow prediction if sequence known

The Beta Bend Motif

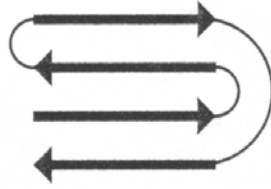


AKA hairpin



(e) Right-handed connection between β strands
not as common

The Greek Key motif



Protein Domains

Domains-several motifs often combine to form compact globular structures
Domains ~50-400 aa that act independently
Structural domains
Often have functional domains
Insulin Receptor Example

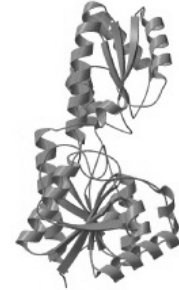
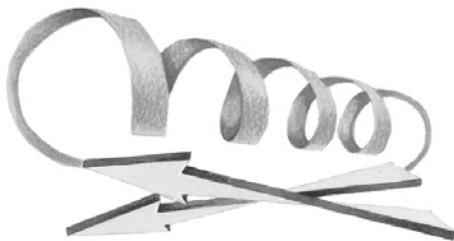


Fig. 6-22 Lehninger POB 3rd ed.

The β - α - β Motif



(a) β - α - β Loop

Conserved Sequence

Protein Folding

Not just any old way.
For a given protein, all molecules have the same shape.
Folding occurs in stages.
Folding can be assisted by other proteins called *chaperones* (\approx 50% use chaperones).

Forces Involved in 3^o Structure

Weak
hydrogen bonds
electrostatic interactions
metal ion coordination
hydrophobic effect

Denaturation

Denaturation- disruption of the normal 3D shape by physical or chemical agents:

alcohol

weak acid or base

heat

detergents

reducing agents

Denaturing is reversible- *Renaturation*