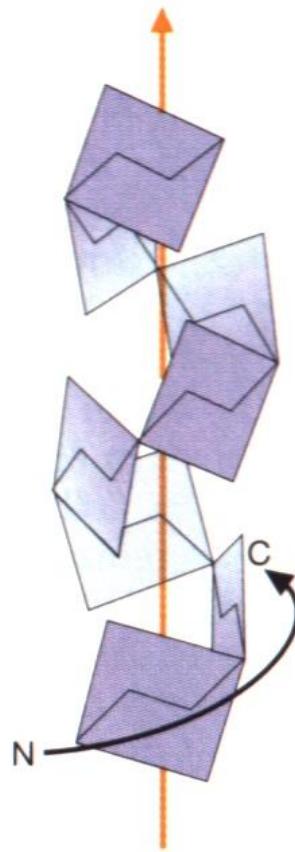
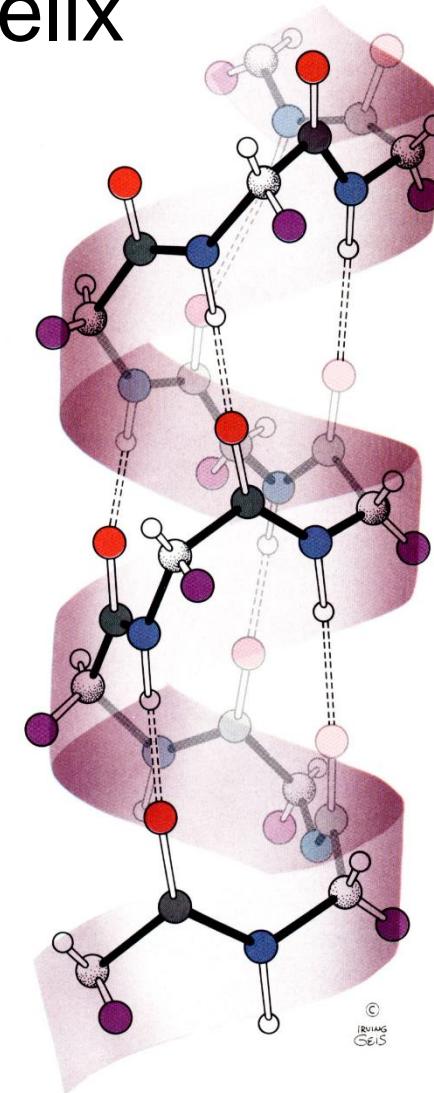
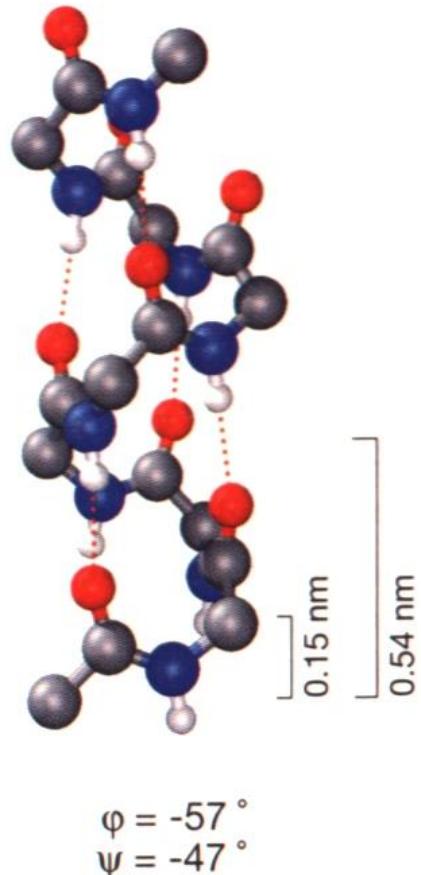


Proteine - Die α -Helix



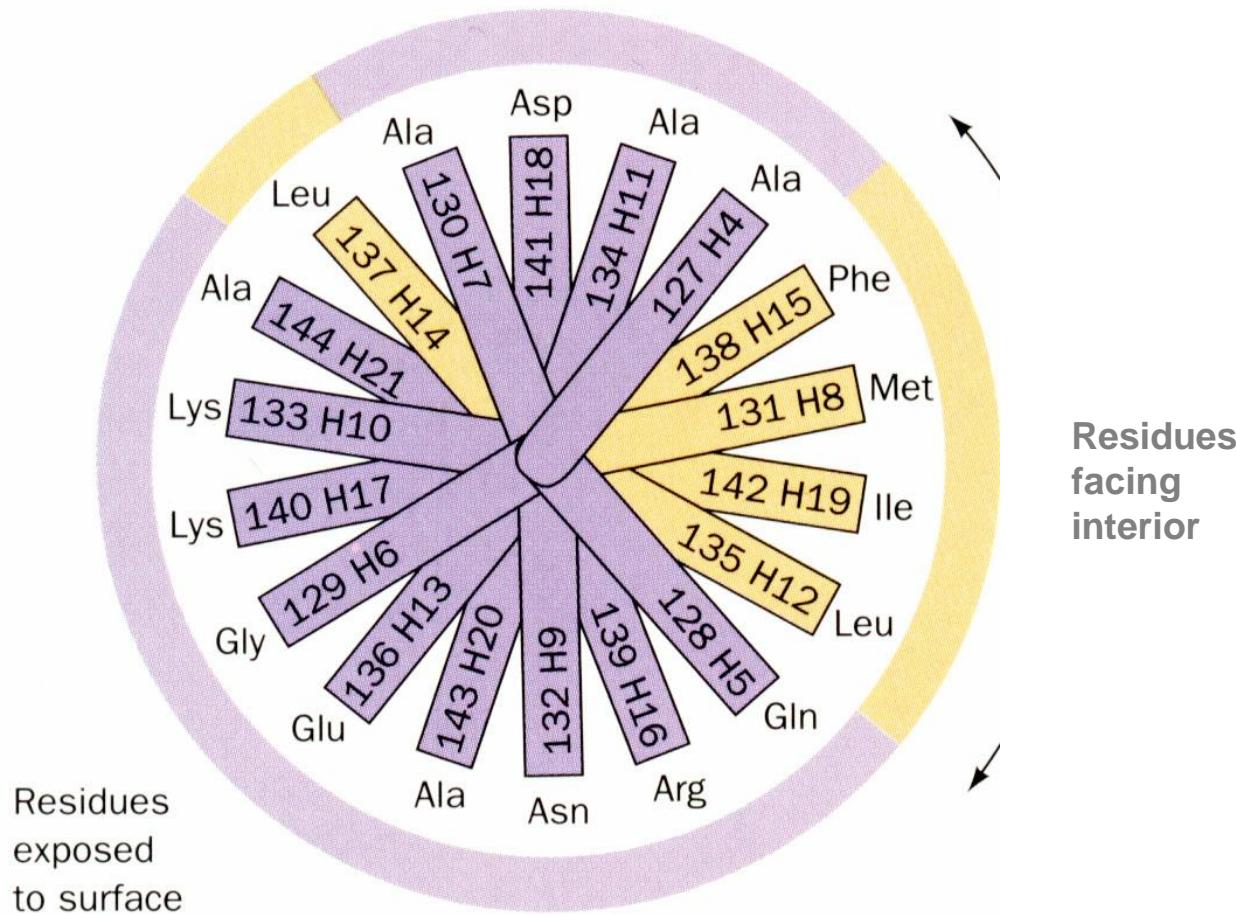
A. α -Helix

Globuläre und Faserproteine
 $\phi = 57^\circ$ und $\psi = 47^\circ$



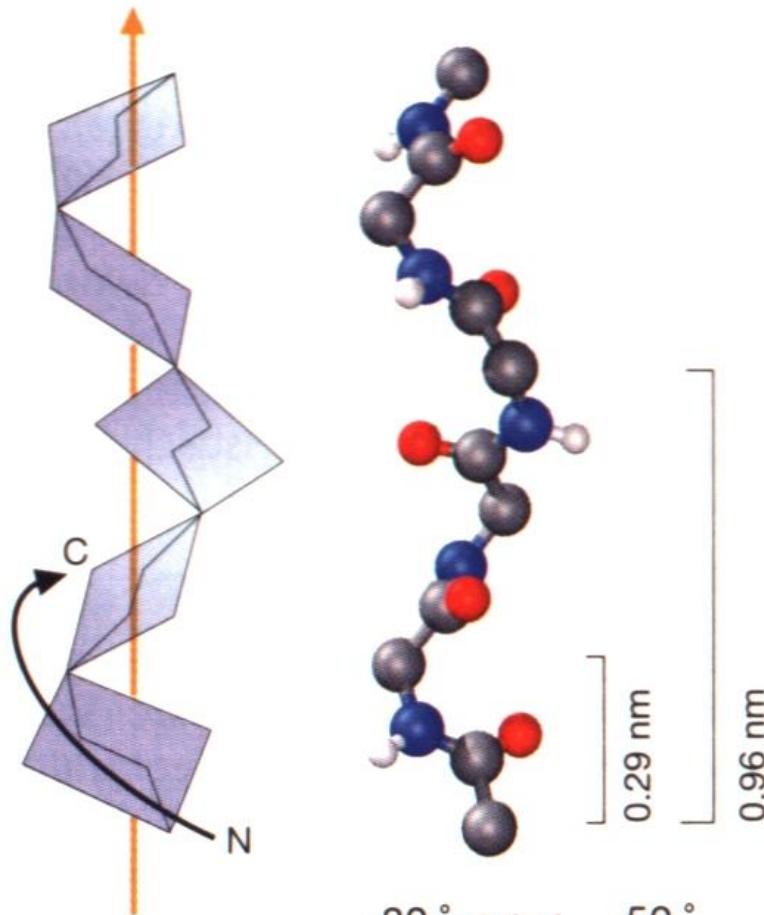
3.6 Aminosäurereste pro Windung
Ganghöhe p (pitch): 0.54 nm.

Die α -Helix des Pottwal-Myoglobins



Funktionales Helixrad: Hydrophile und hydrophobe Flächen!

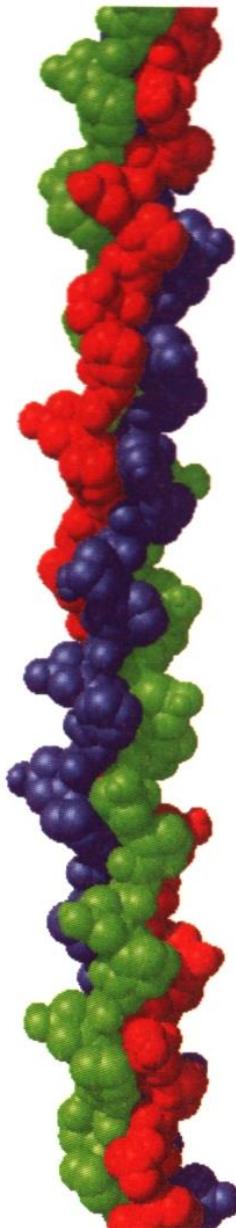
Die Kollagen-Helix



B. Collagen-Helix

3_{10} -Helix: allein nicht stabil!

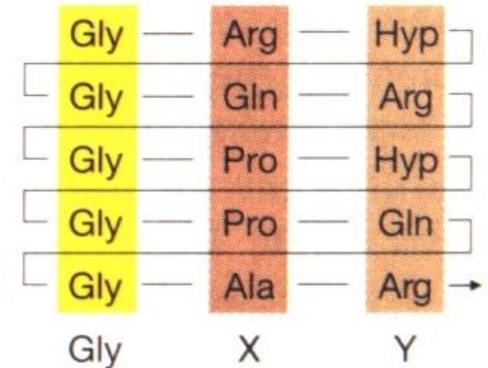
Die Kollagen-Helix



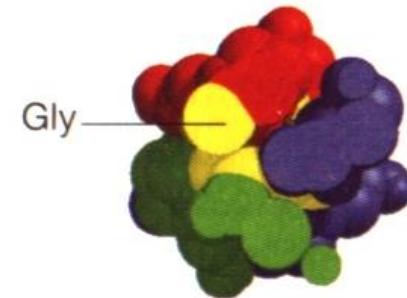
Viel Prolin und Hydroxyprolin

Alle 3 AS Glycin:
hydrophobe WW
im Inneren

1. Tripelhelix (Ausschnitt)



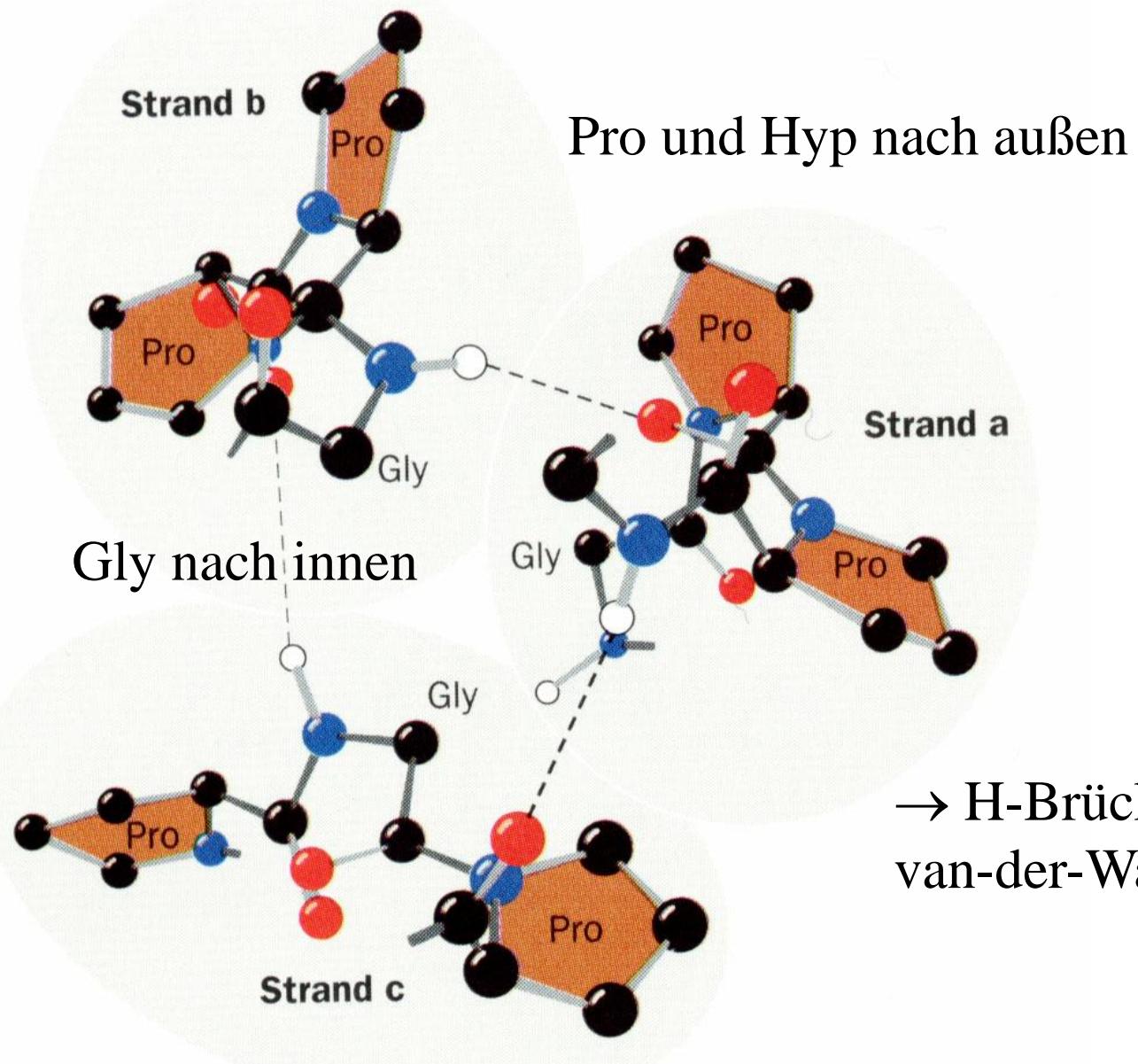
2. Typische Sequenz



3. Tripelhelix (Aufsicht)

B. Collagen

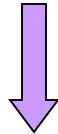
Die Kollagen-Helix



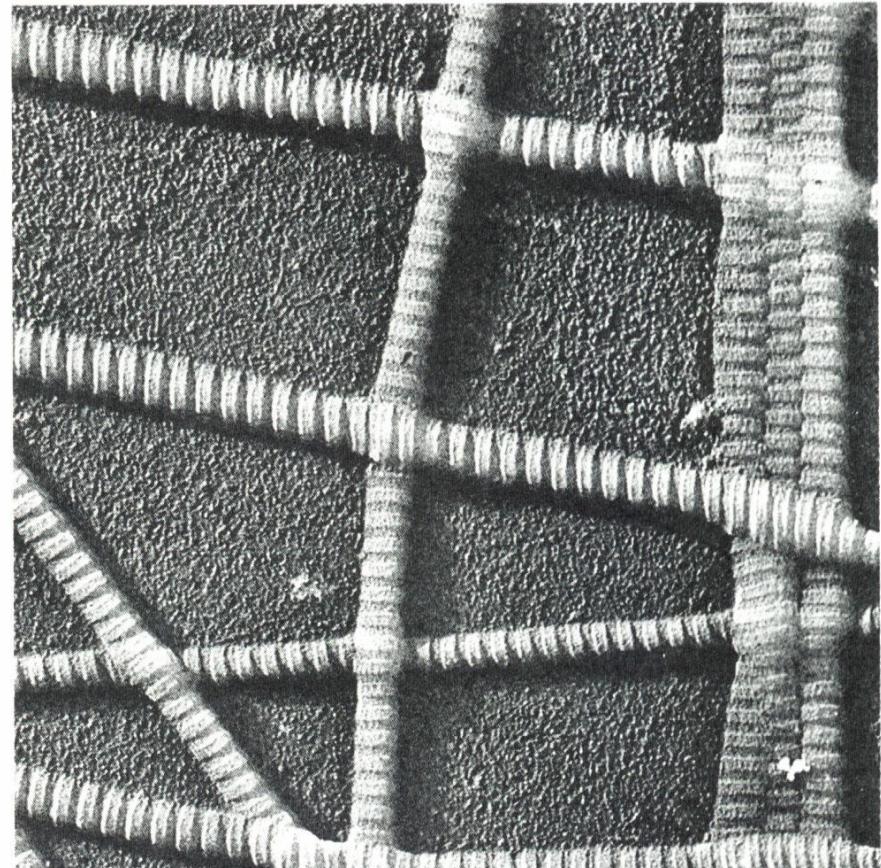
Elektronenmikroskopie



Aggregation
zu Fibrillen



Zugfestigkeit
Faserprotein

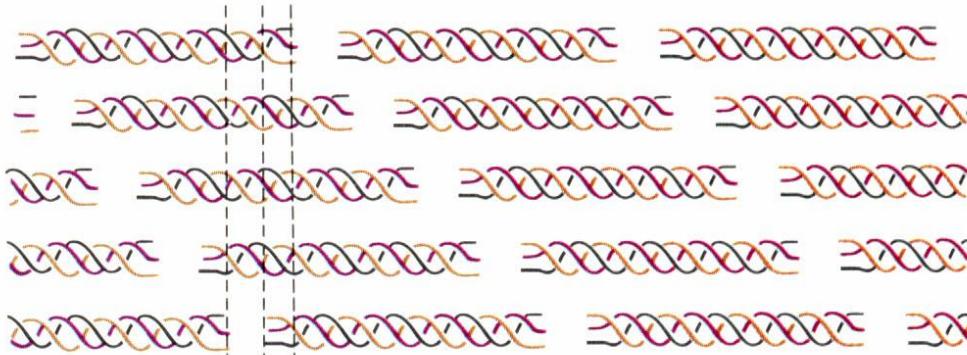


Packung im Fibrillenstrang

Collagen molecule



Packing of molecules

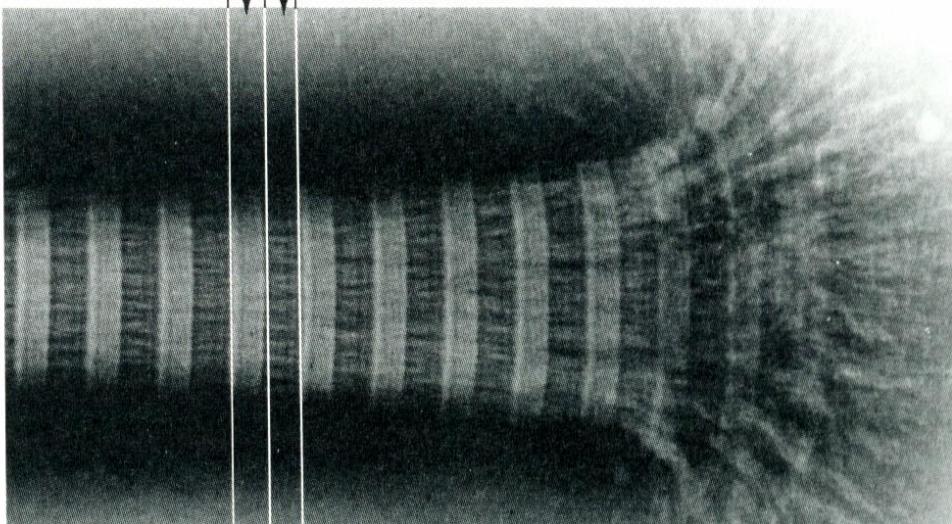


Hole zone

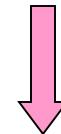
0.6D

Overlap zone

0.4D



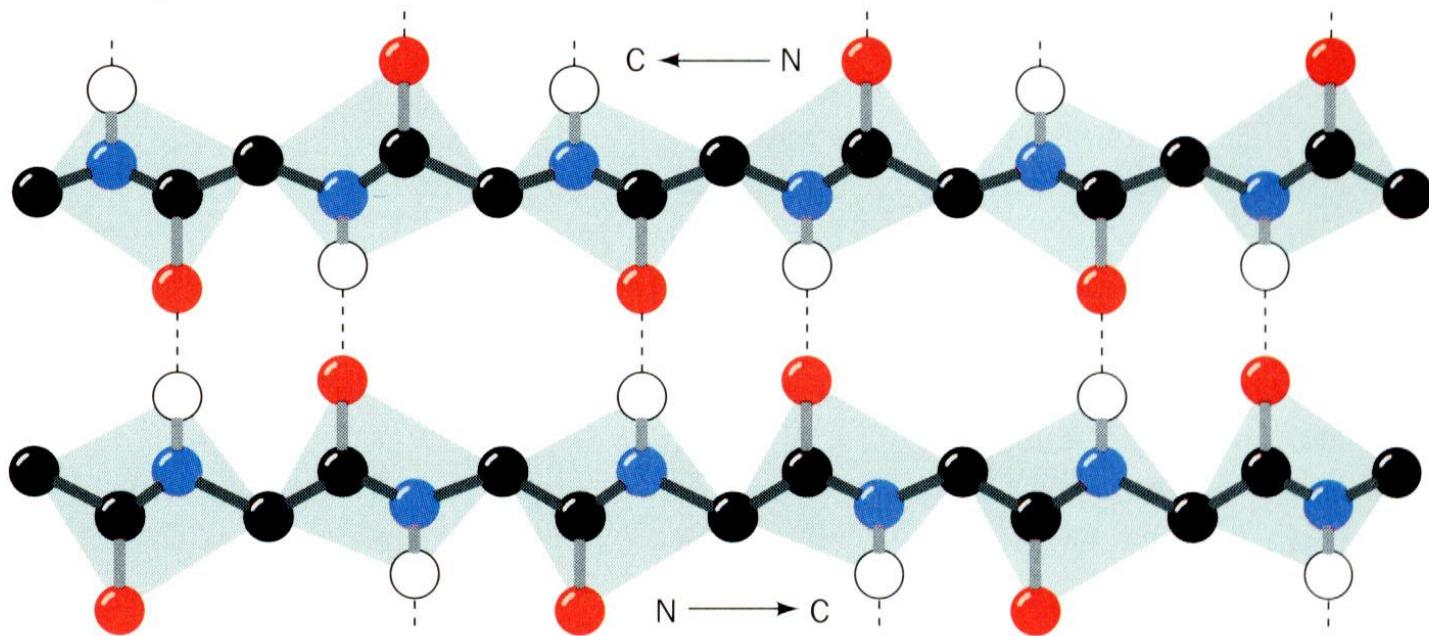
präzis
gestaffelt



Periodisch
eingekerbte
Oberfläche

β -Faltblatt

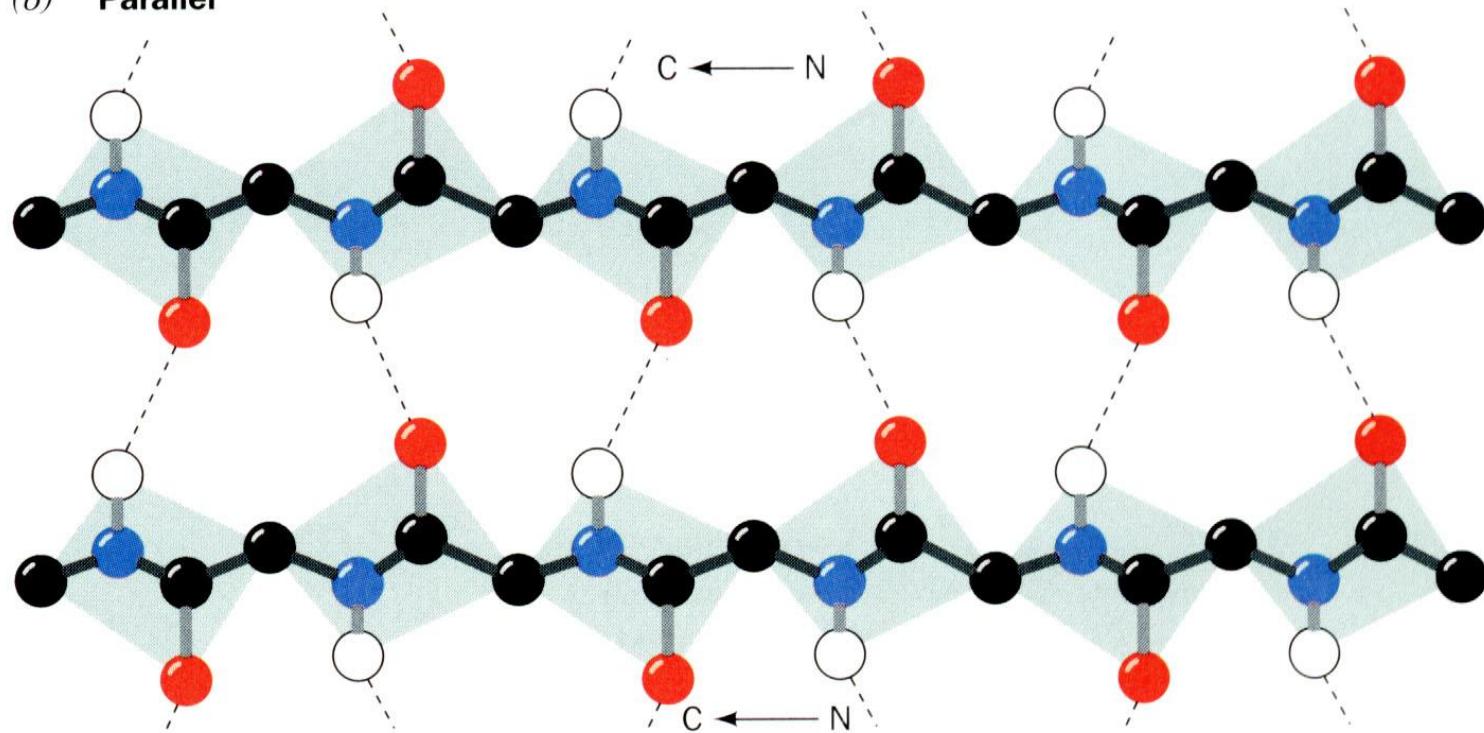
(a) **Antiparallel**



Gestreckte Kette: zwei benachbarte Stränge paaren

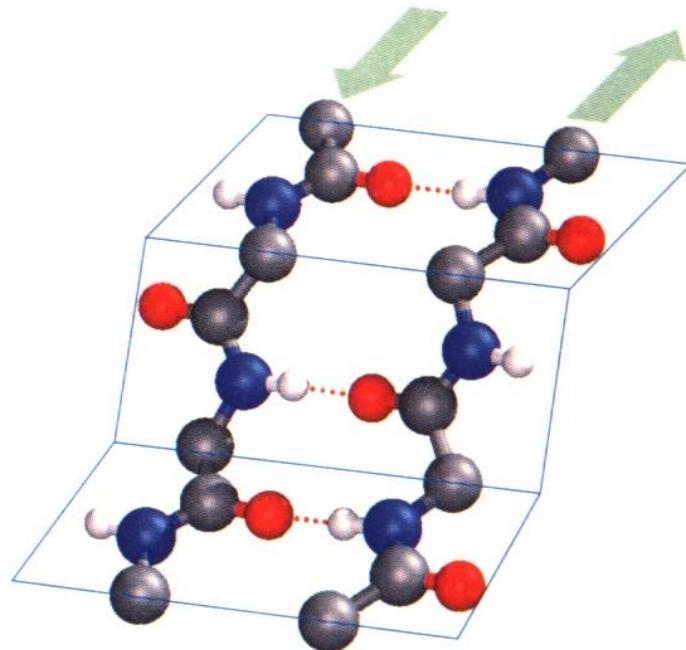
β -Faltblatt

(b) **Parallel**



Parallel: Gewinkelte H-Brücken - schwächere Bindung

Erscheinungsbild



1. antiparallel

C. Faltblatt-Strukturen

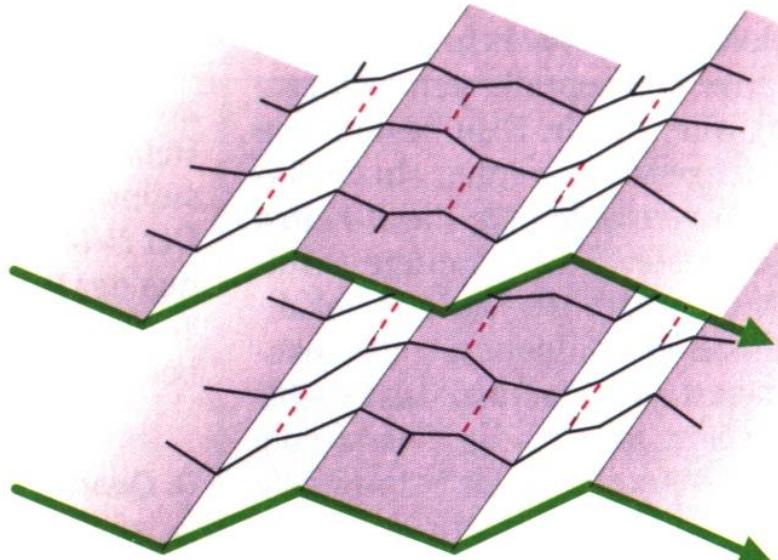
$$\begin{aligned}\varphi &= -139^\circ \\ \psi &= +135^\circ\end{aligned}$$

2. parallel

$$\begin{aligned}\varphi &= -119^\circ \\ \psi &= +113^\circ\end{aligned}$$

Knicke des Faltblatts nur an α -C-Atomen (sp^3)

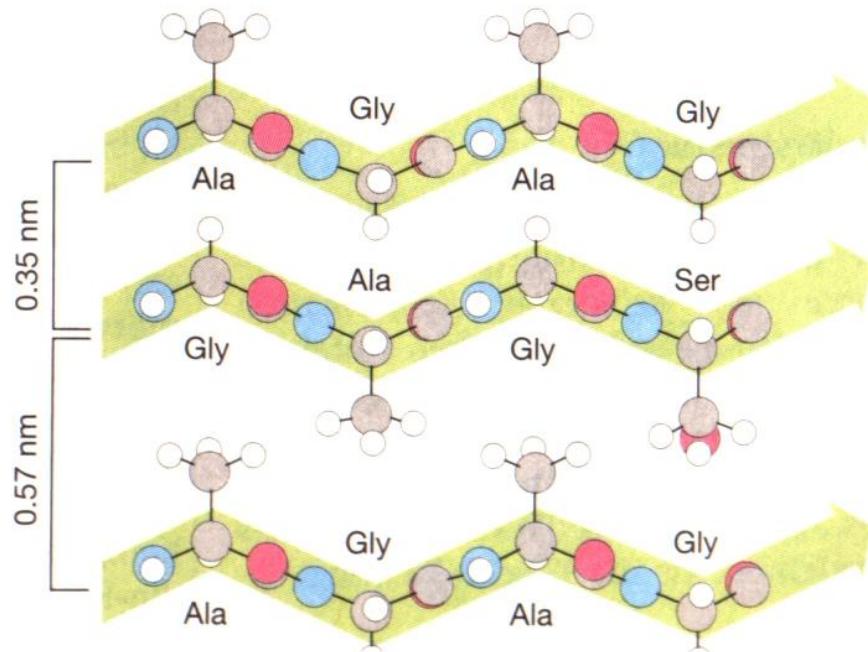
Seidenfibroin



1. Räumliche Darstellung

Viel Ala und Gly: →
verschiebbar - geschmeidig

β -Faltblatt-Stapel



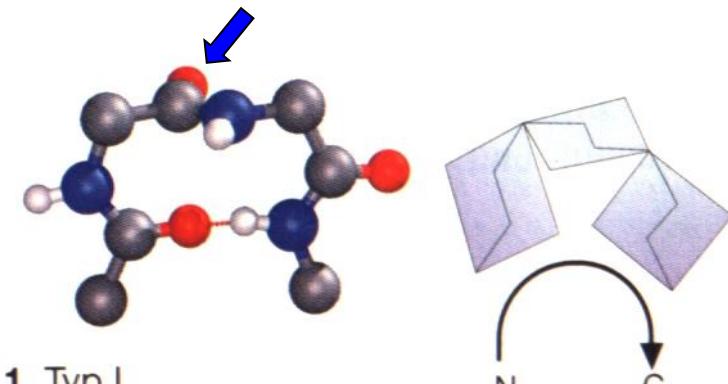
2. Frontalansicht

C. Seiden-Fibroin

β -Schleifen

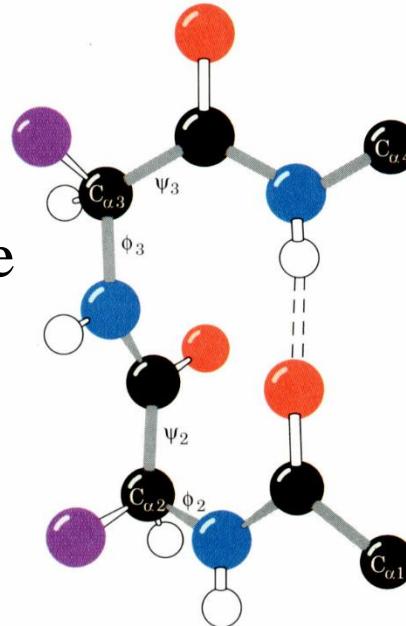
4 Aminosäuren mit $1 \rightarrow 4$ H-Brücke

Typ I und II: Peptidbindung $2 \rightarrow 3$

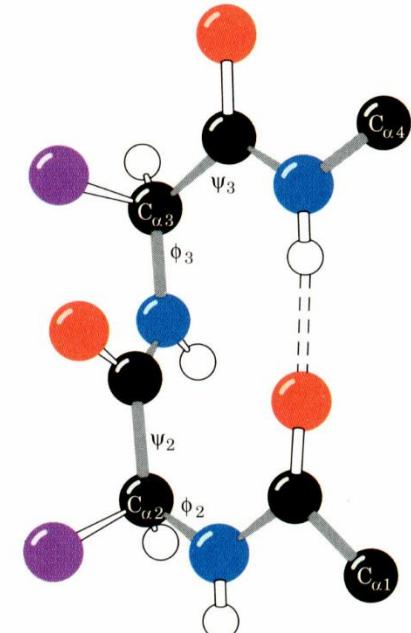


D. β -Schleifen

(a) Type I β bend



(b) Type II β bend

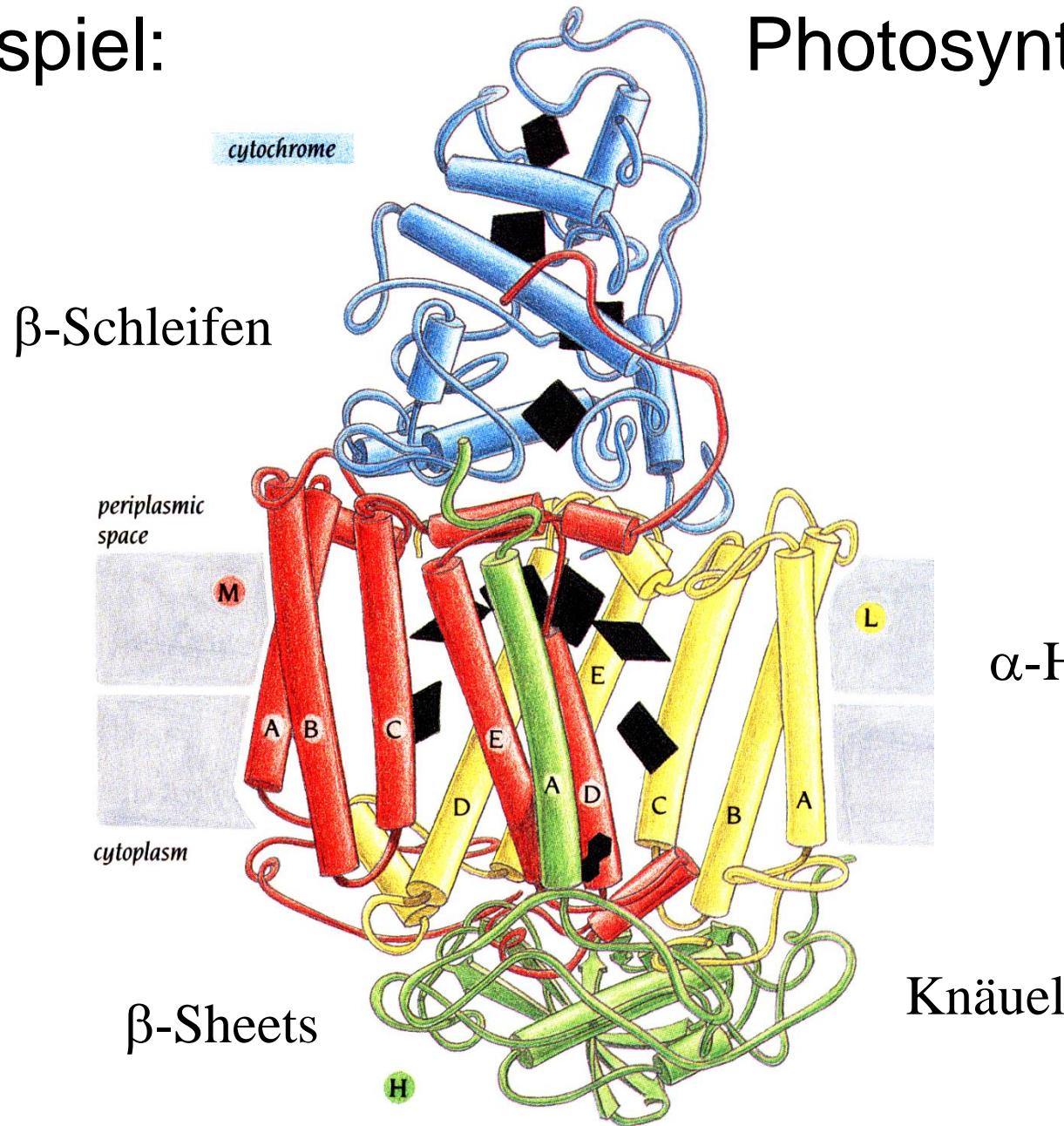


2. Typ II

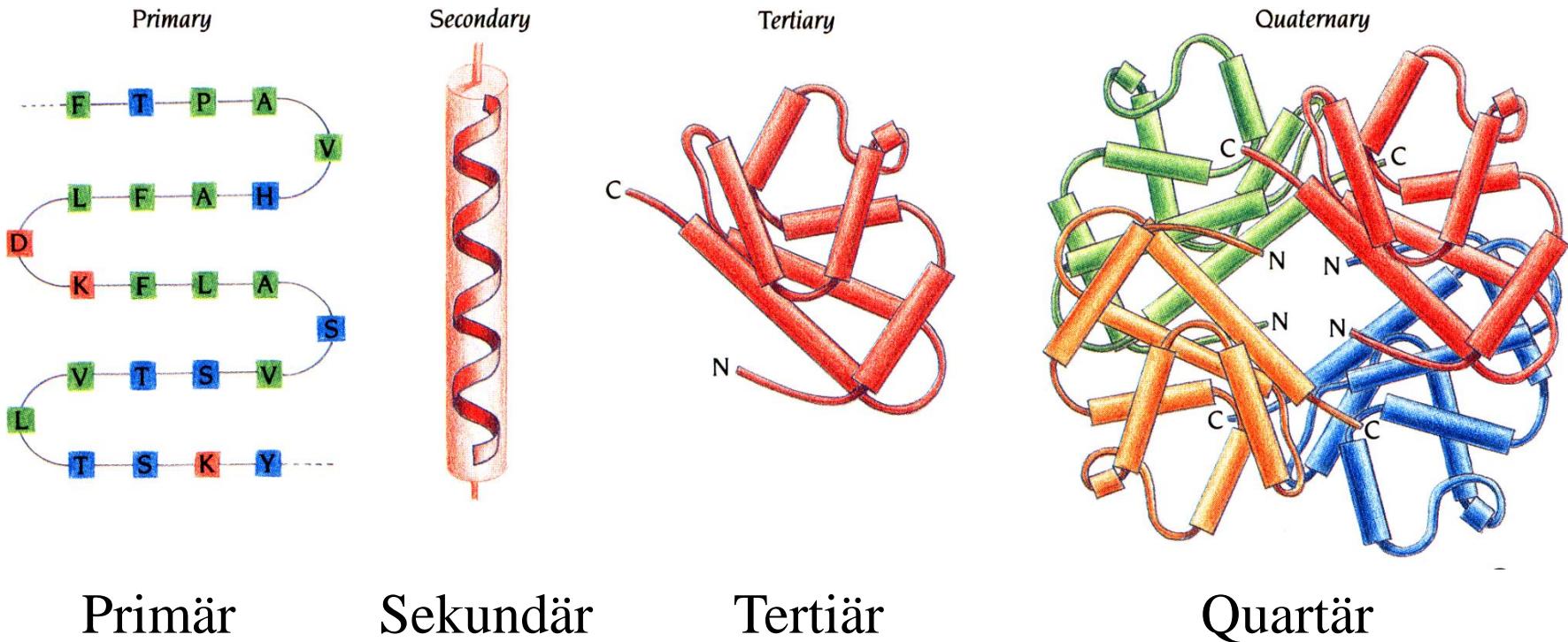
Richtungsänderungen - β -turns!

Beispiel:

Photosynthese-
zentrum



Von der Sequenz zur Quartärstruktur



→→→ Die Primär- bestimmt die Tertiärstruktur!