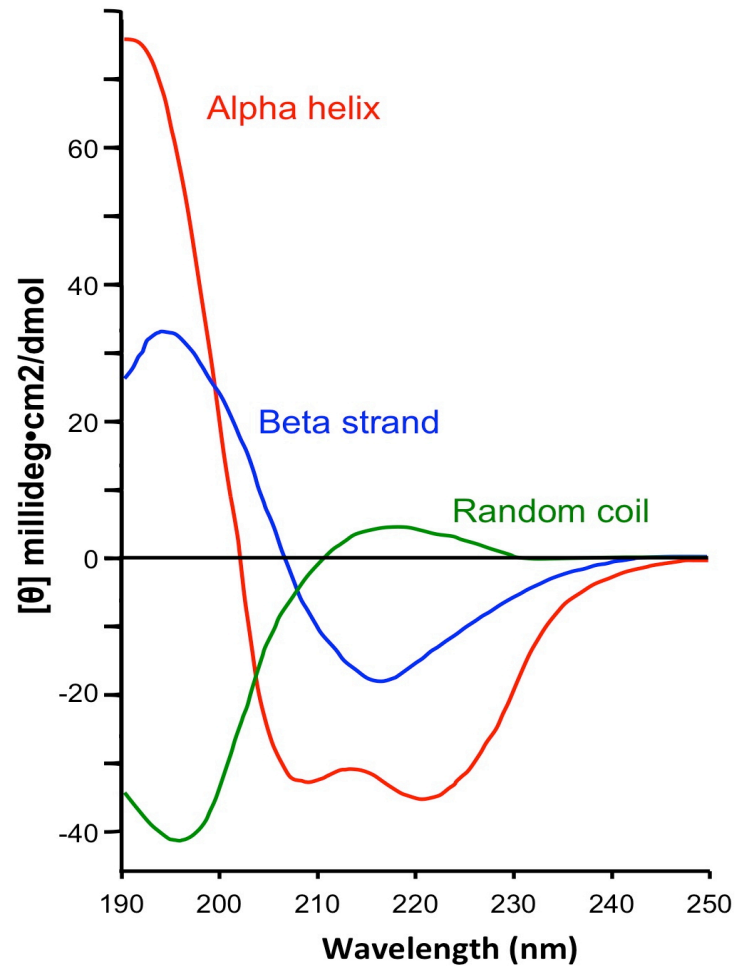


CD Spectra of 2° Structure

θ = ellipticity

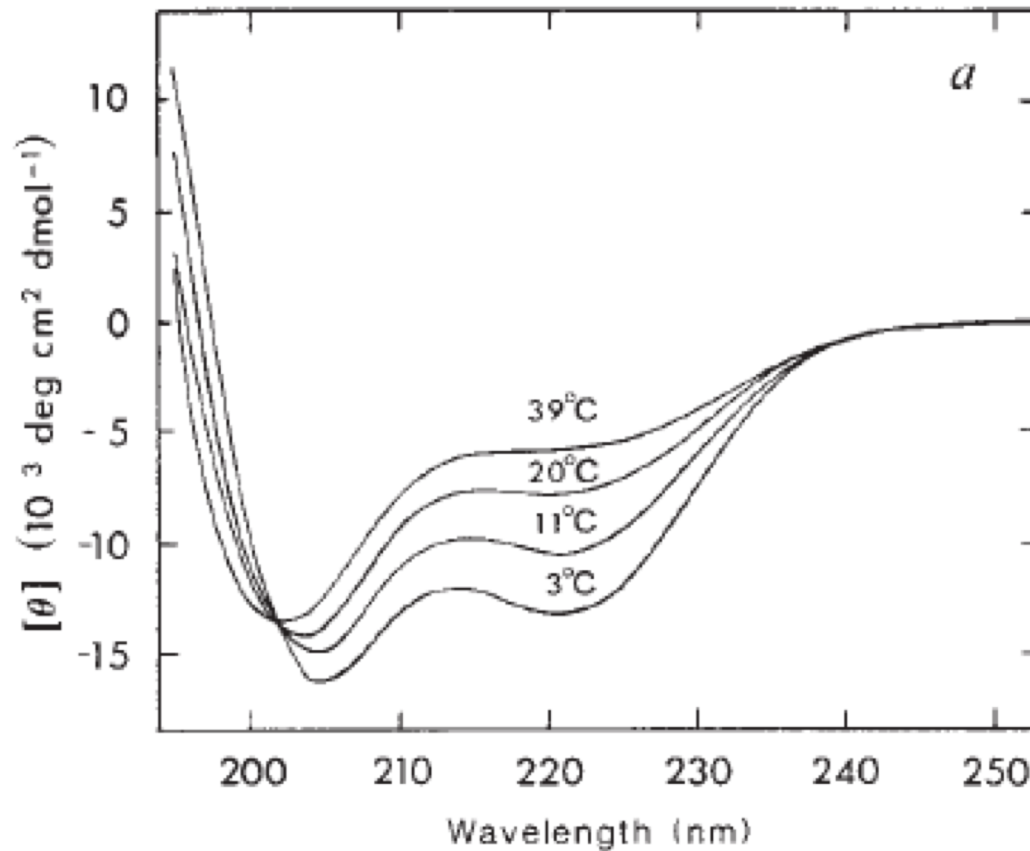
$[\theta]$ = molar ellipticity

$[\theta] = 3298(\epsilon_L - \epsilon_R)$



Temperature & Helix Stability

Sequence: Ac-AETAAAKFLRAHA-NH₂



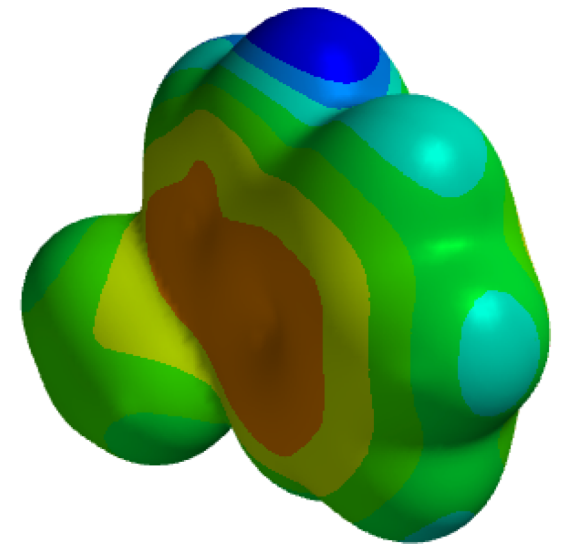
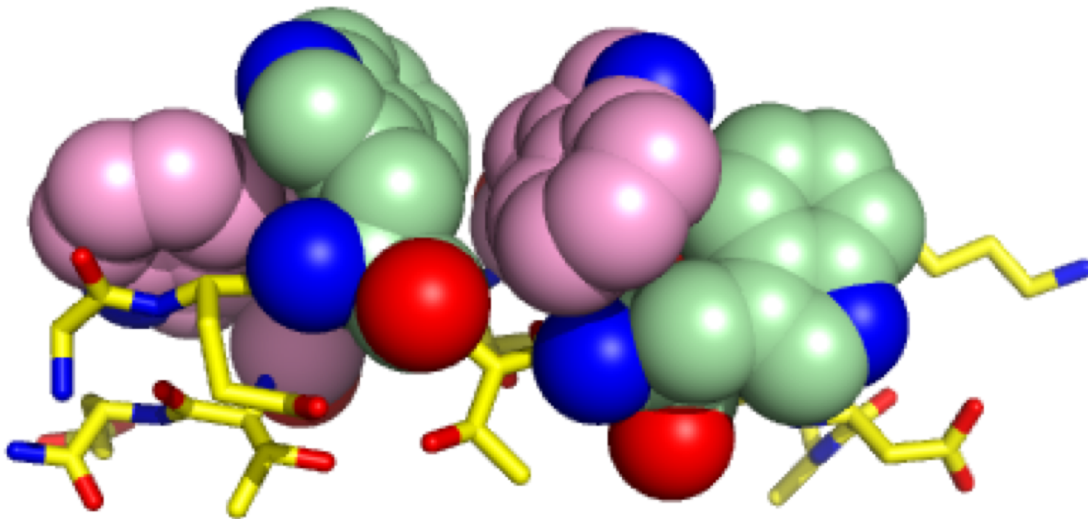
Chou-Fasman Parameters

Amino Acid	P_{α}	P_{β}
Alanine	142	83
Arginine	98	93
Aspartic Acid	101	54
Asparagine	67	89
Cysteine	70	119
Glutamic Acid	151	137
Glutamine	111	110
Glycine	57	75
Histidine	100	87
Isoleucine	108	160
Leucine	121	130
Lysine	114	74
Methionine	145	105
Phenylalanine	113	138
Proline	57	55
Serine	77	75
Threonine	83	119
Tryptophan	108	137
Tyrosine	69	147
Valine	106	170

The **propensities** (in %)
 P_{α} and P_{β} are calculated from
fraction of residues of each
amino acid in that conformation
divided by fraction of all residues
occupying that conformation.

TrpZip: Stable Hairpin Turn

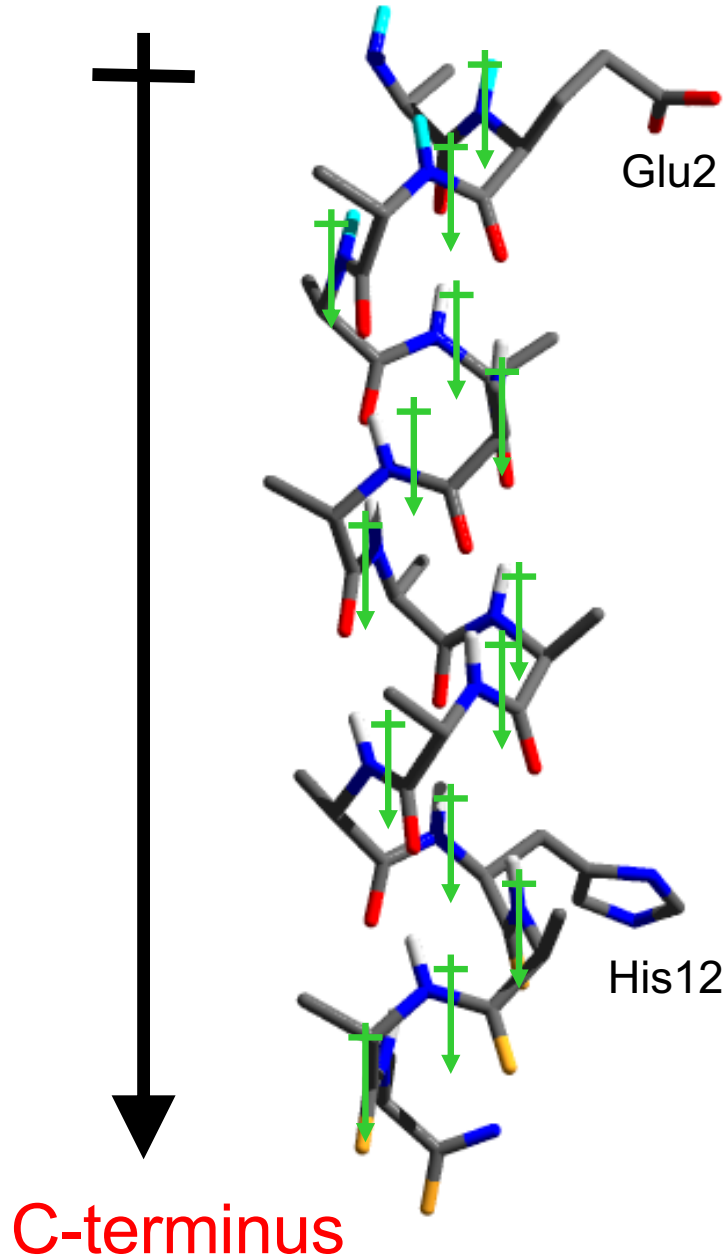
gb1 GEWTYDDATKTFVTE $T_m \approx 0^\circ\text{C}$
Trpzip GEWTWDDATKKTWTWTE $T_m = 70^\circ\text{C}$



$$\Delta H_{\text{fold}}^\circ = -17 \text{ kcal/mol}$$
$$\Delta S_{\text{fold}}^\circ = -48 \text{ cal/molK}$$

N-terminus

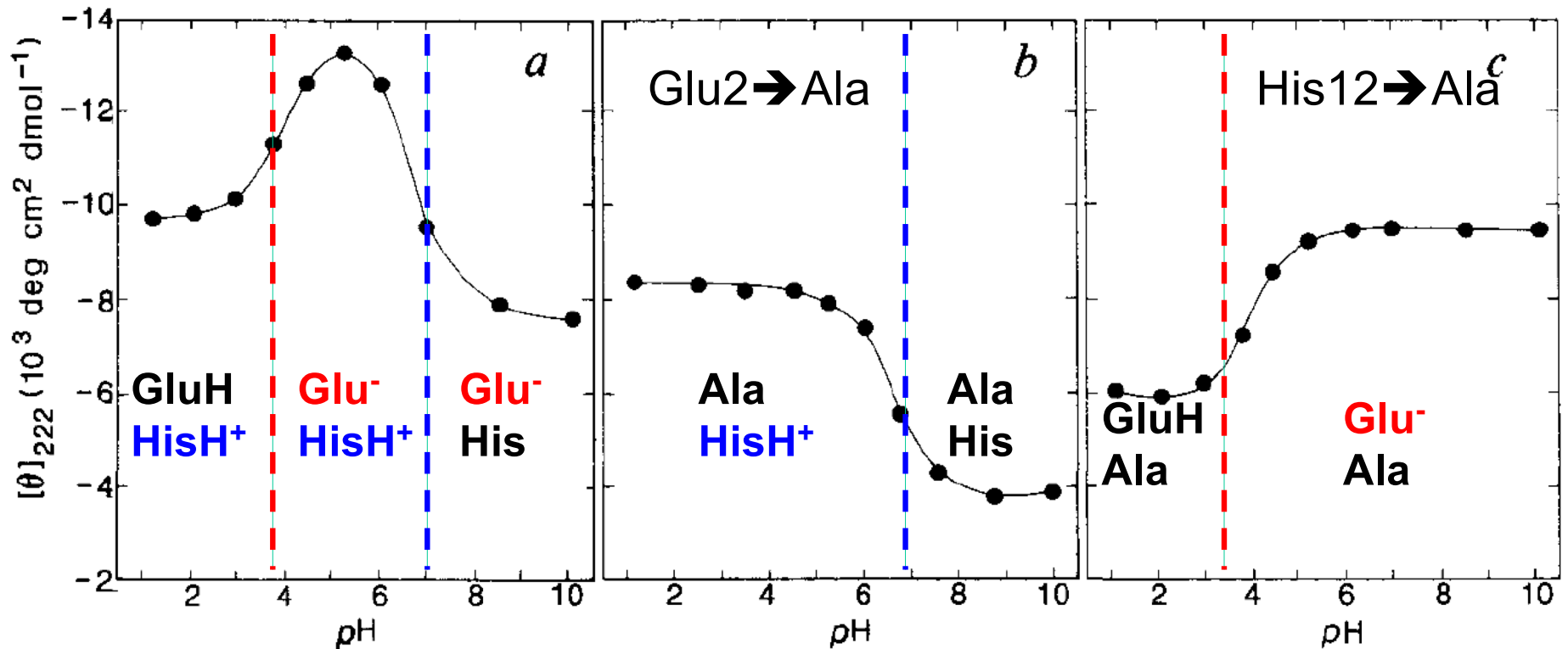
Helix Dipole



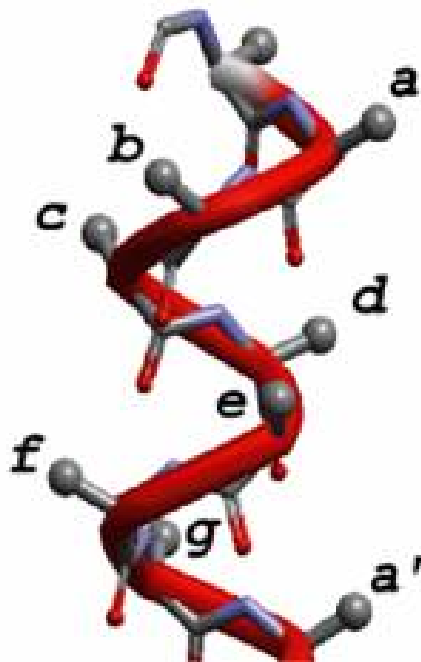
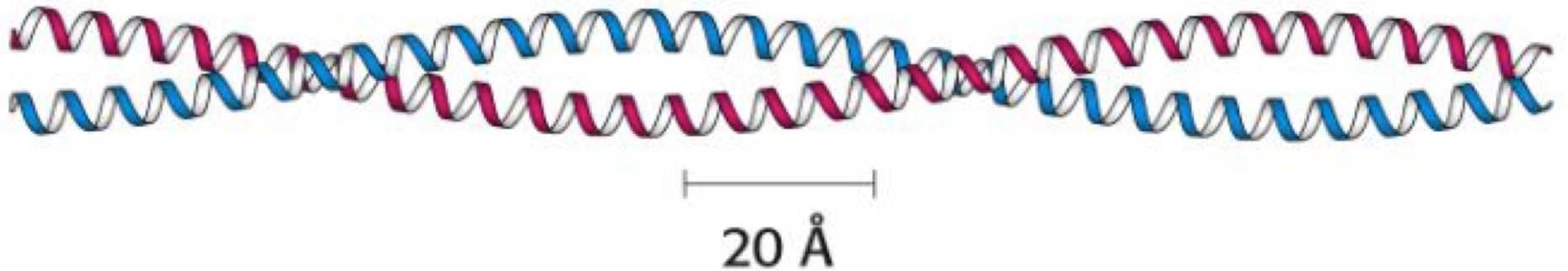
The Helix Dipole, proposed by Wim Hol, predicts that there will be an overall separation of charge related to the alignment of each individual amide group dipole within the helix. The N-terminus will experience the **positive** end of the dipole, and the C-terminus will experience the **negative** end.

Test of the Helix Dipole Model

Sequence: Ac-A**E**TAAAKFLRA**H**A-NH₂



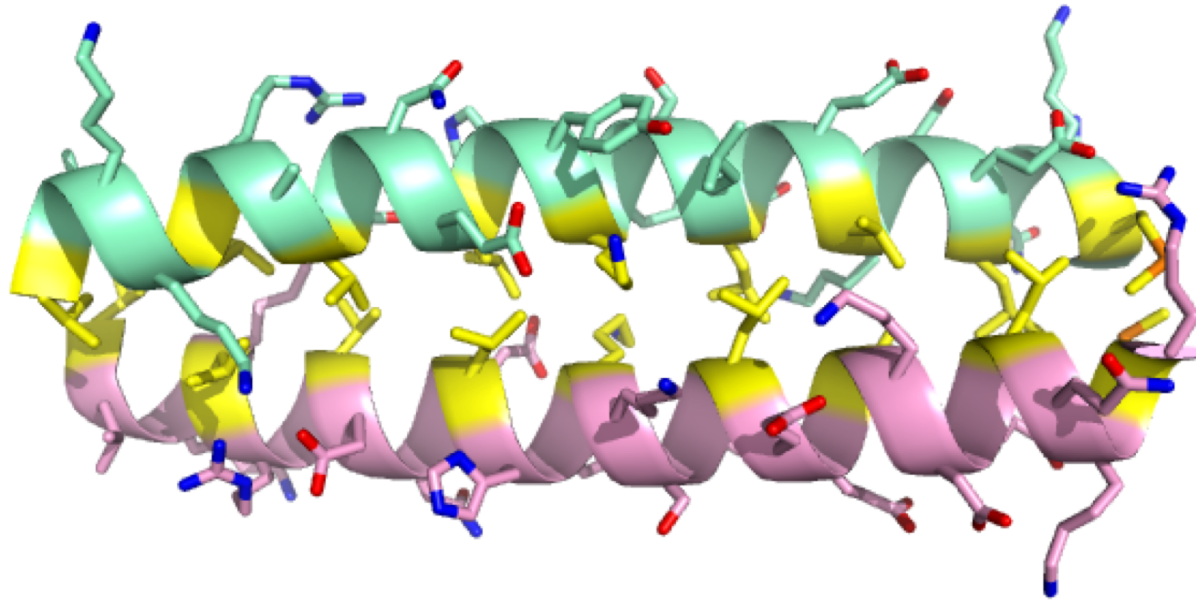
α -Keratin: A Stable Dimer of Helices



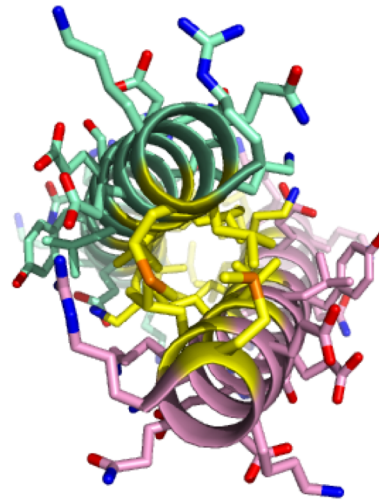
The “Heptad Repeat”

a	Leu
b	Xaa
c	Xaa
d	Leu
e	Xaa
f	Xaa
g	Xaa
a'	Leu

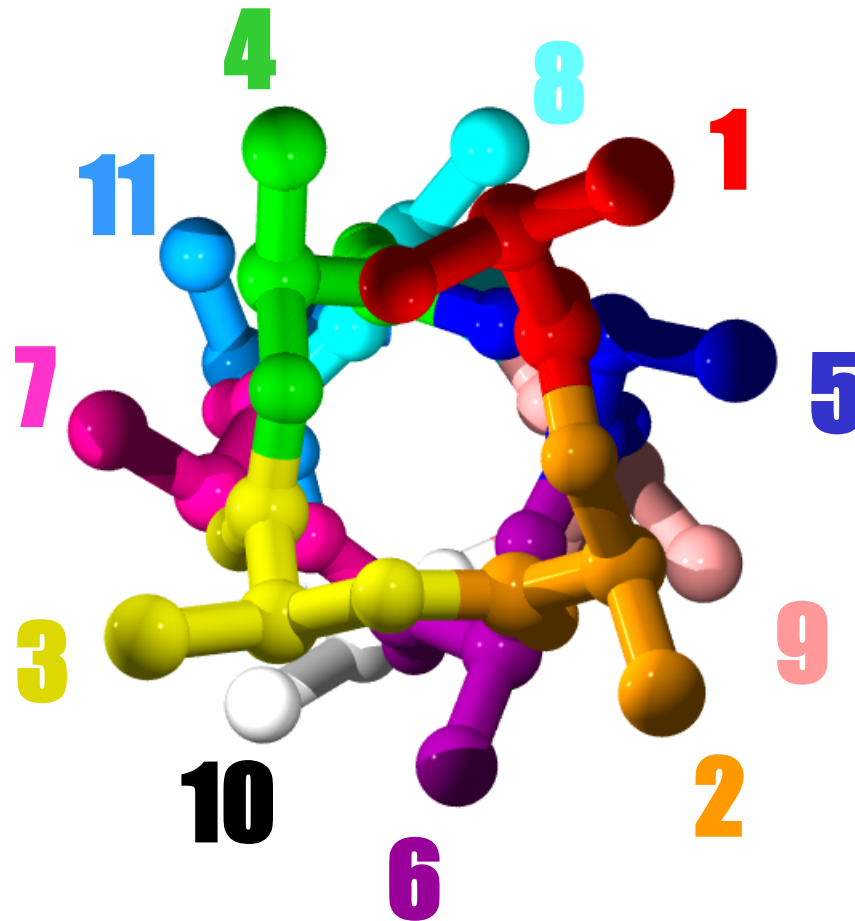
Coiled coil dimer



Heptad repeat residues
shown in yellow



The Helical Wheel

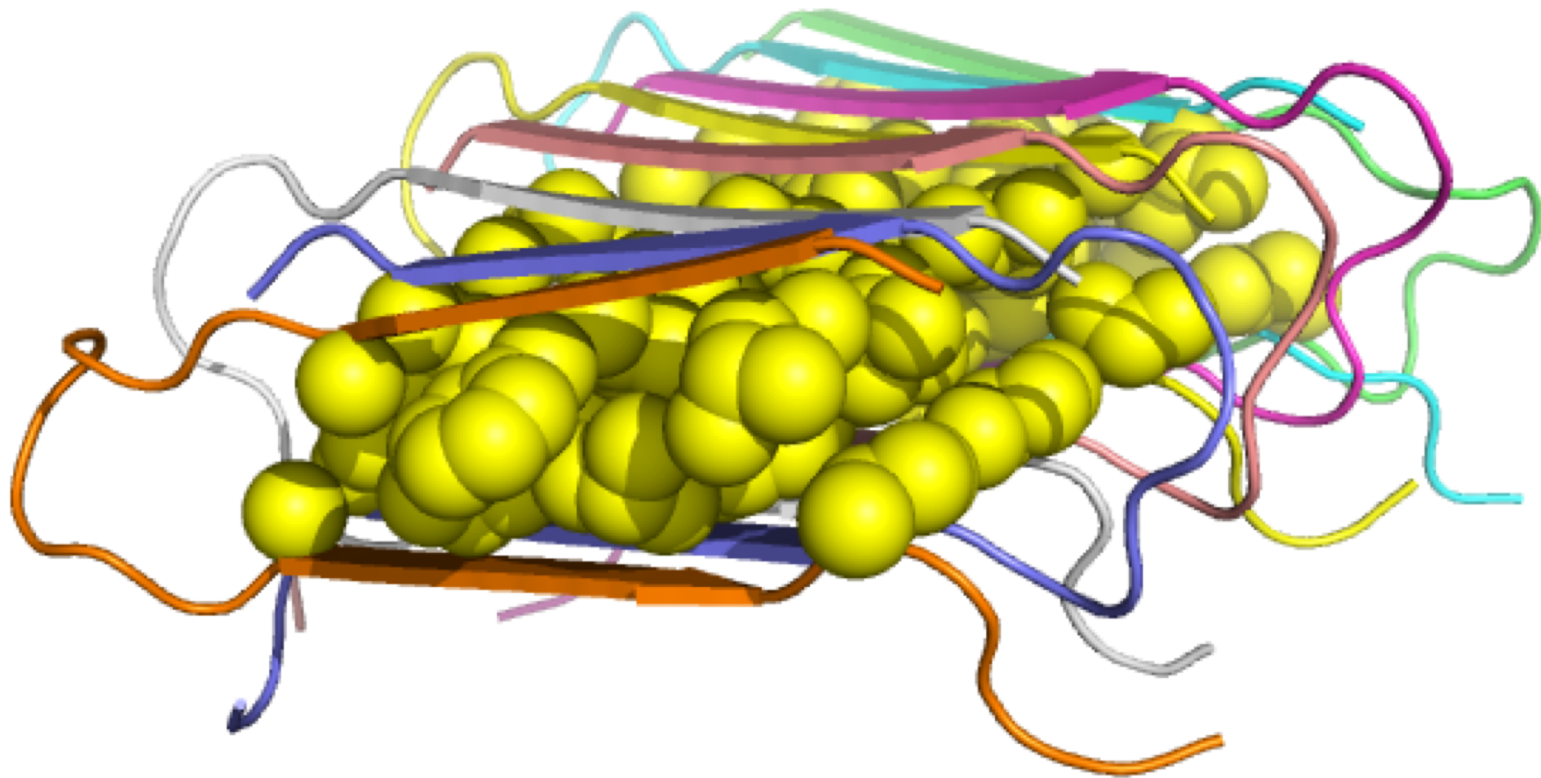


LEALEKKLAAL

12345678901

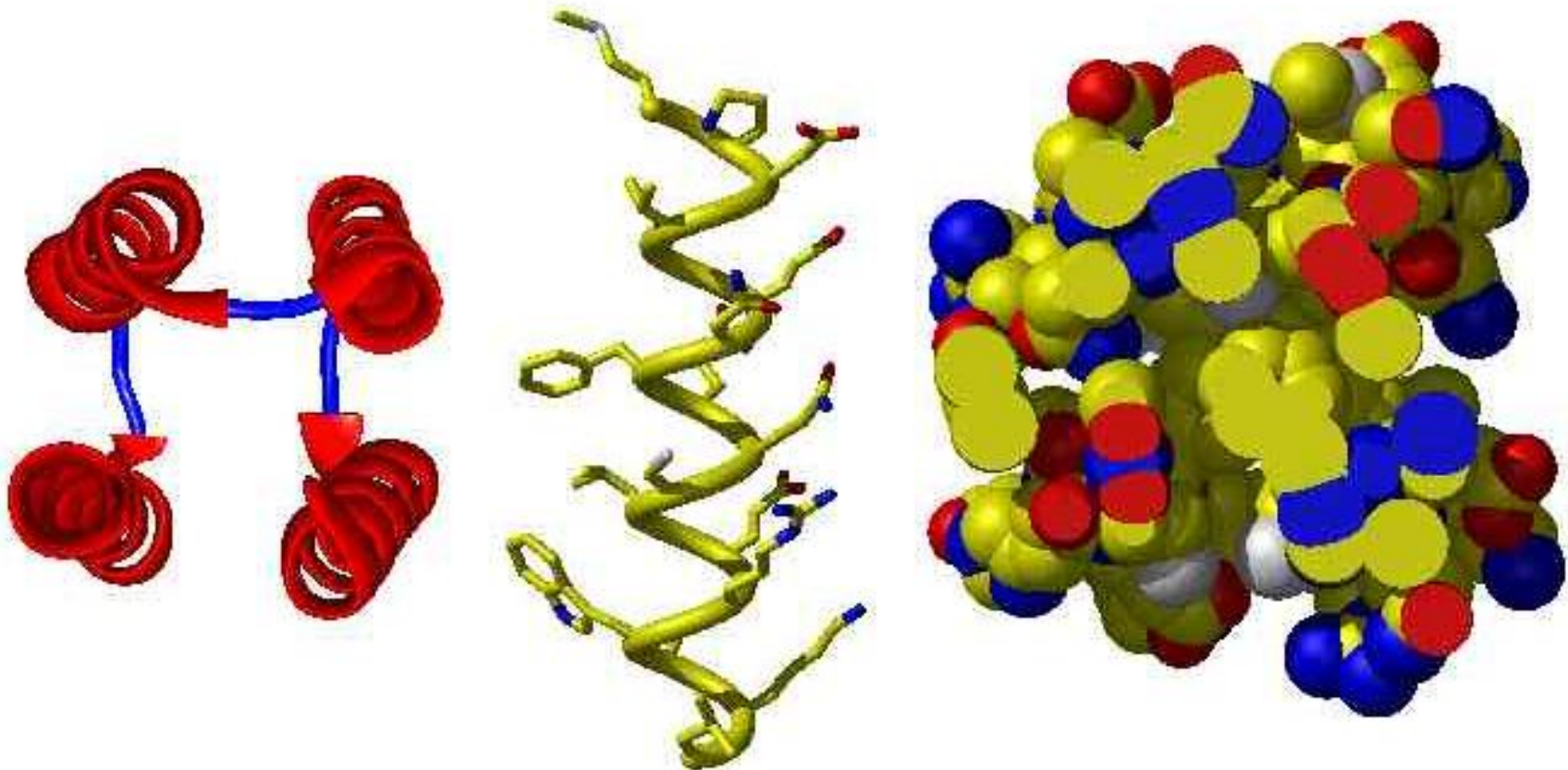
β -Sheet in Amyloid Fibrils

QKLVFFAENVSNNKKAIGLMVGGVV



Four Helix Bundle

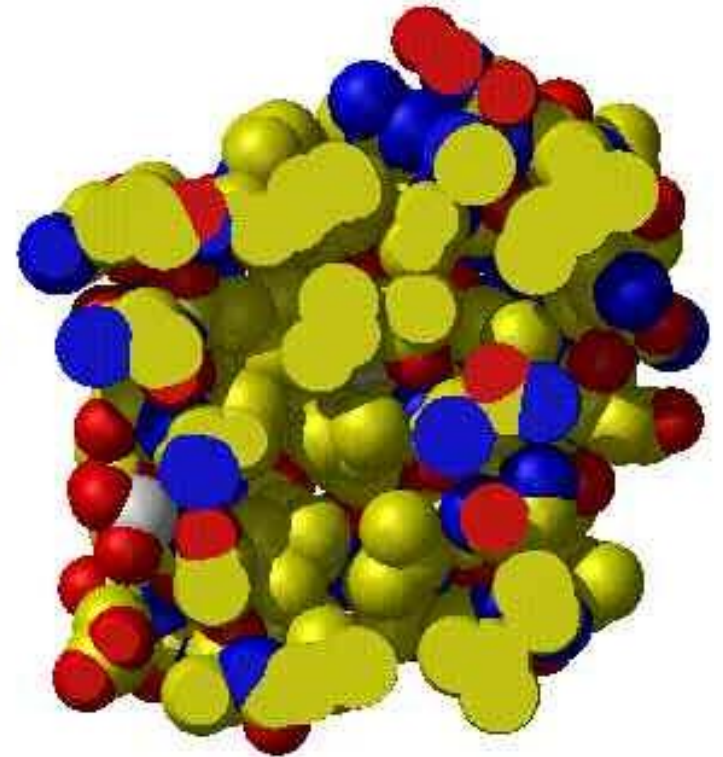
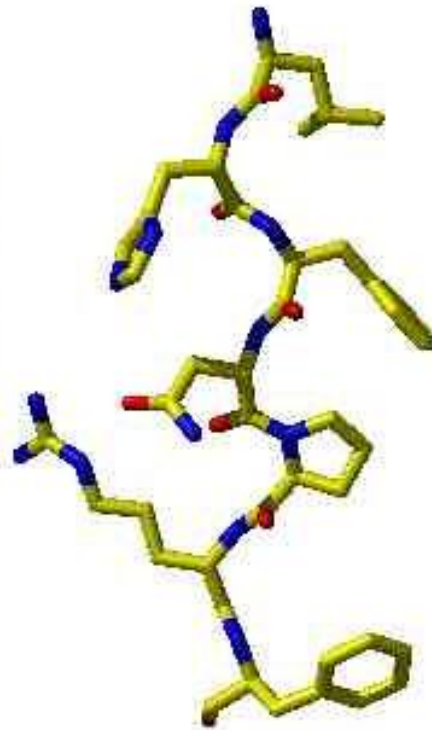
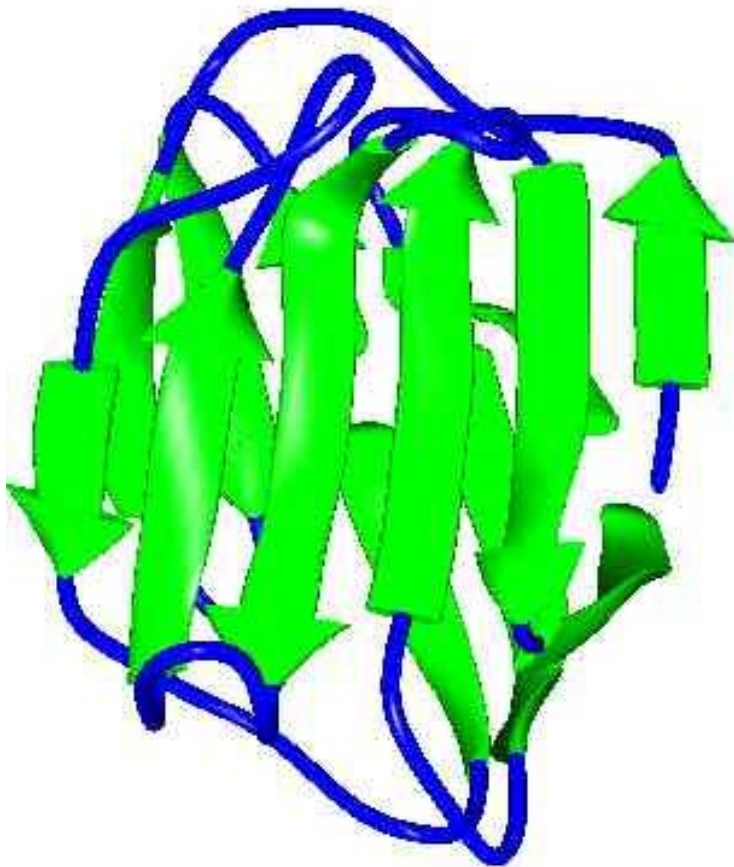
Theoretical model of *de novo* designed protein, felix:
Richardson *et al.*, *Science*, **249**, 884(1990) 3flx



amphiphilic
helix

Antiparallel β -Sandwich

S-Lectin from Bovine Spleen
Liao *et al.*, *PNAS*, **91**, 1429(1994) 1sl



amphiphilic
strand