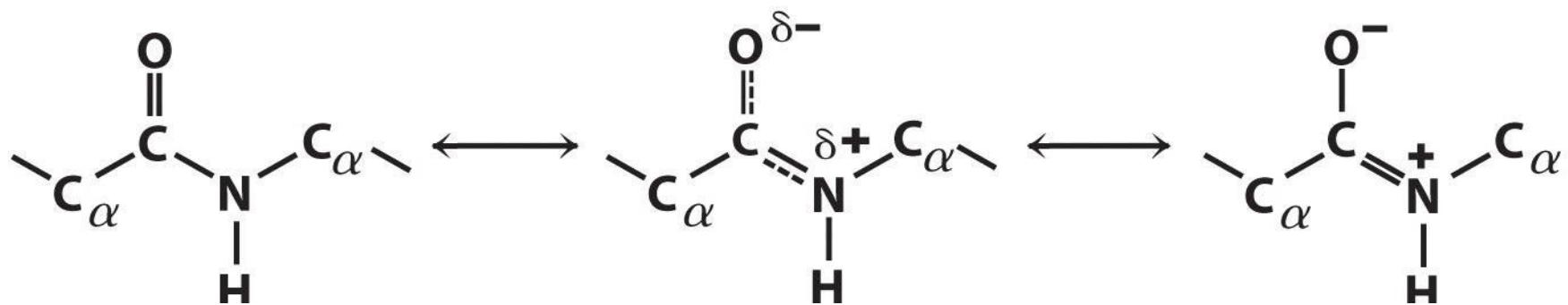


PROTEINI

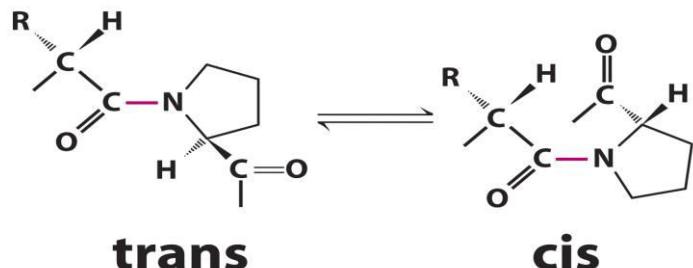
Funkcije proteina

- Dinamička
 - 1. transportna
 - 2. regulaciona
 - 3. enzimi
 - 4. zaštitna
 - 5. održavanje volumena plazme
- Strukturna
 - 1. matriks za kosti i vezivna tkiva
 - 2. čvrstina, elastičnost, oblik organizma

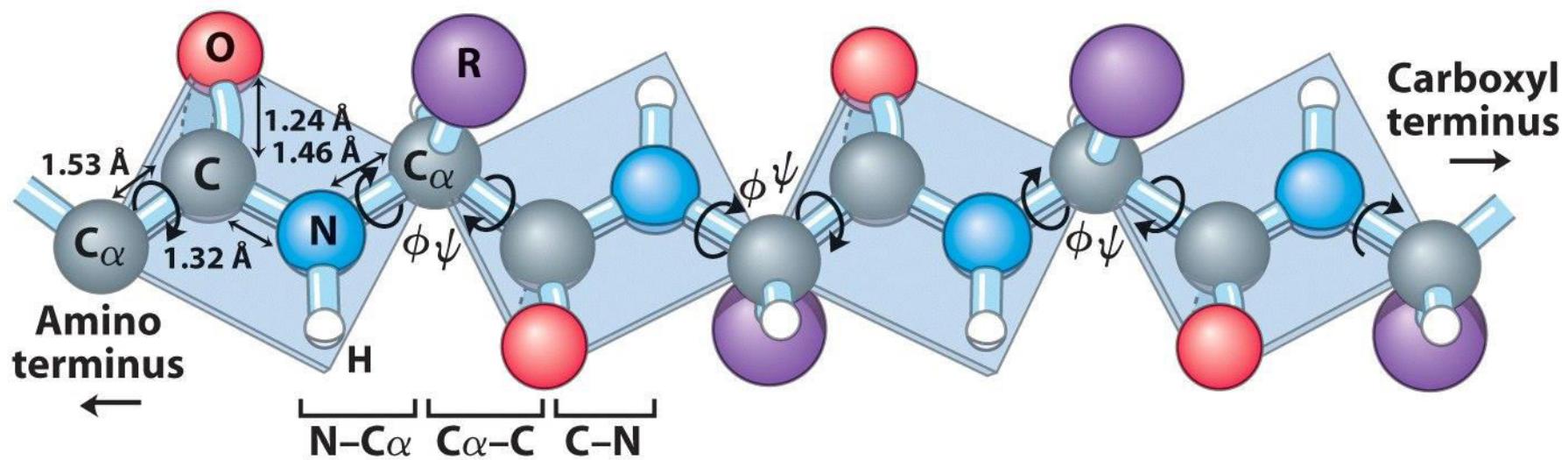
PEPTIDI KONFIGURACIJA PEPTIDNE VEZE



Proline isomers



KONFORMACIJA PEPTIDA



NOMENKLATURA PEPTIDA

- OLIGOPEPTIDIdo 10 AK
- POLIPEPTIDI.....do 100 AK
- PROTEINI.....više od 100 AK

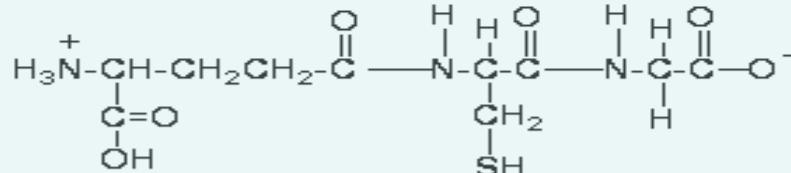
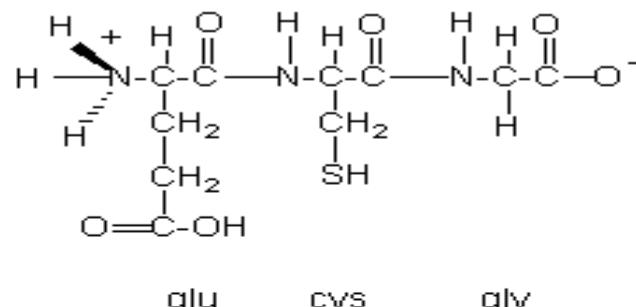
KISELO-BAZNE OSOBINE PEPTIDA

- Slobodne NH_3^+ i COO^- grupe
- R grupe

***Amino grupa i karboksilna grupa peptidne veze NE mogu da disosuju!

PRIRODNI PEPTIDI

- Glutation – L-glutamil-L-cisteinil-glicin



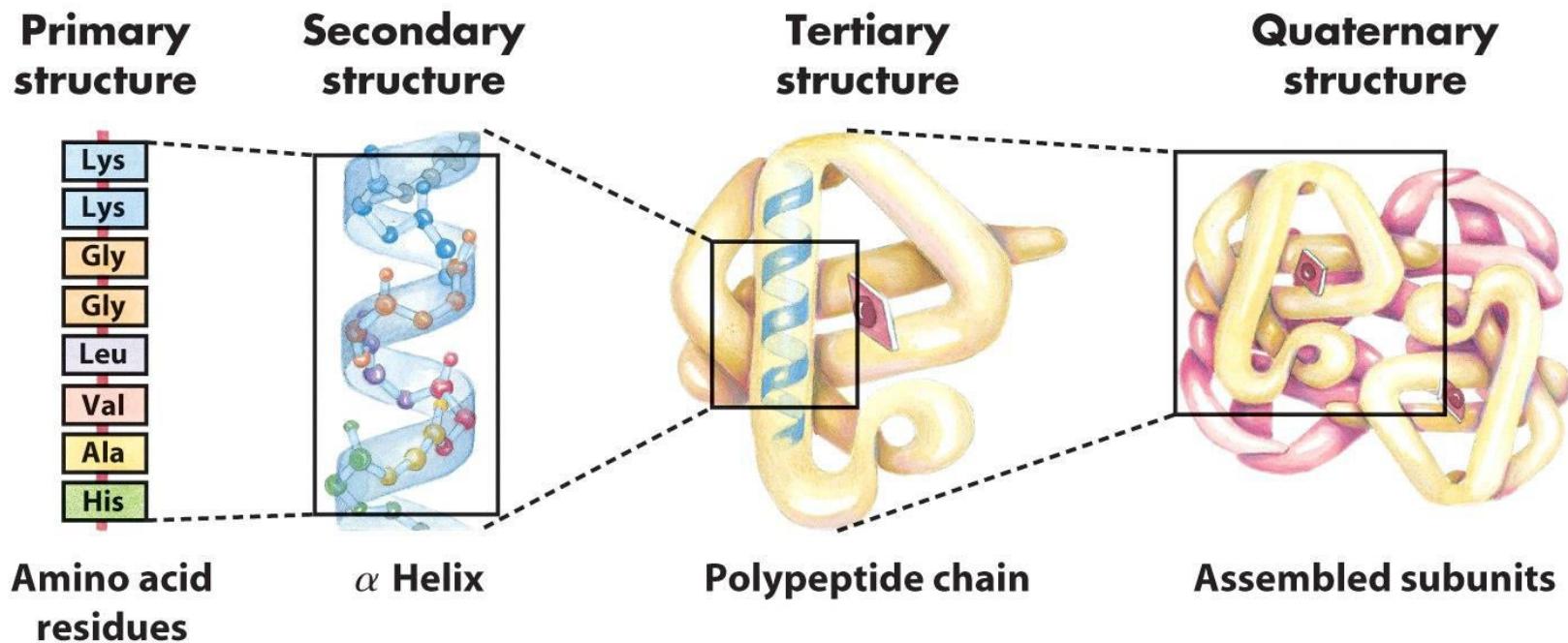
Glutathione

C. Ophardt, c. 2003

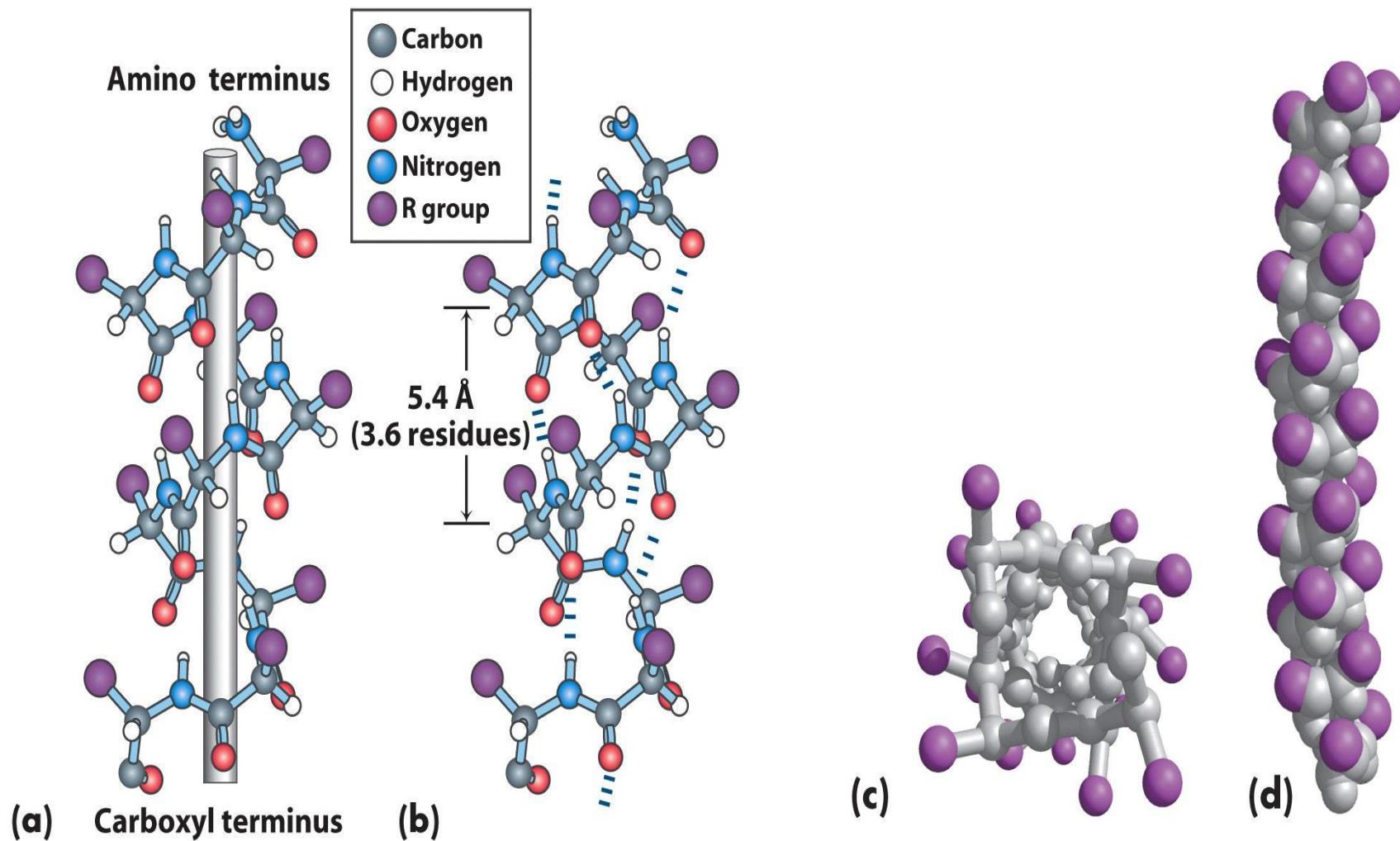
PRIRODNI OLIGOPEPTIDI: OKSITOCIN, VAZOPRESIN...9 AK

PRIRODNI POLIPEPTIDI: INSULIN, GLUKAGON51AK tj. 29AK

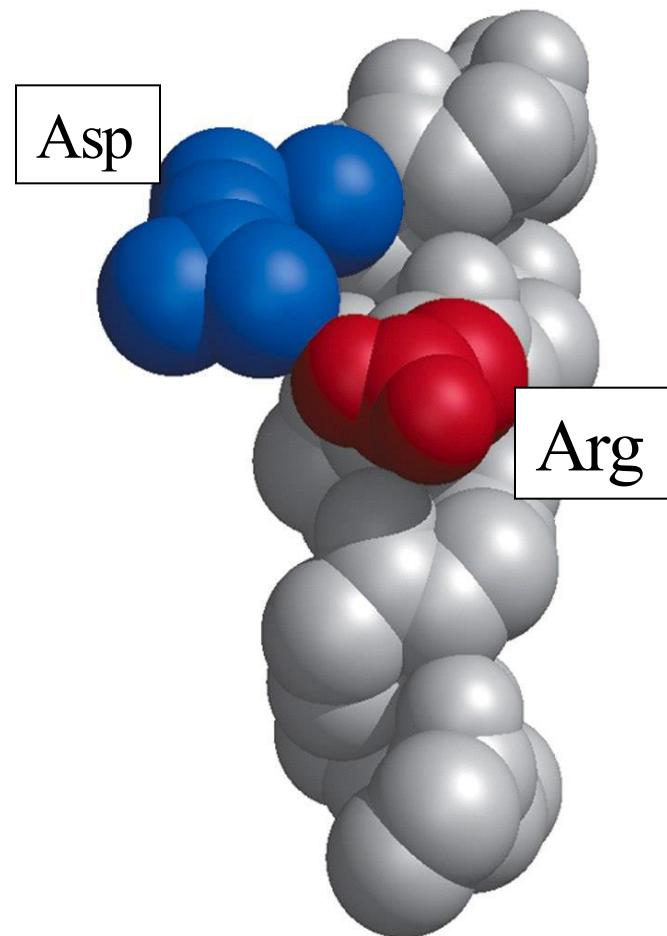
STRUKTURA PROTEINA



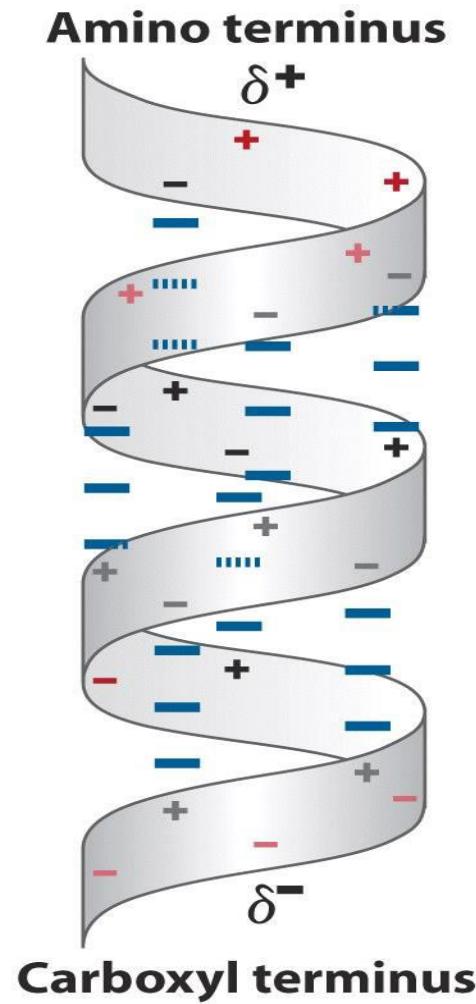
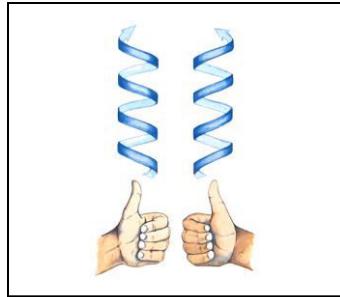
SEKUNDARNA STRUKTURA PROTEINA α -HELIKS



INTERAKCIJA NAELEKTRISANIH R OSTATAKA U α -HELIKSU PROTEINA TROPONIN C



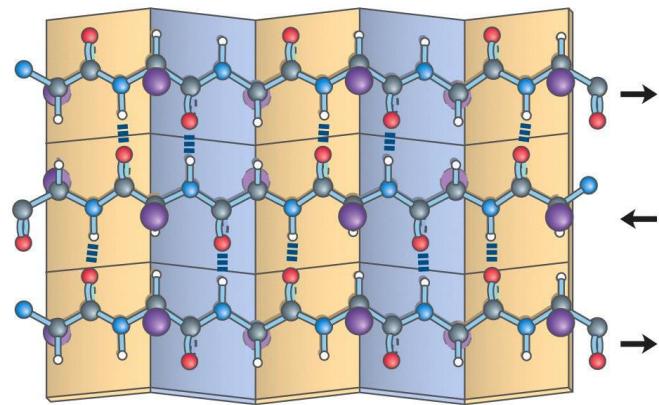
Dipolarna priroda α -heliksa



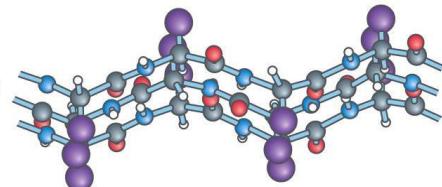
β -struktura, β -presavijena ploča

ANTIPARALELNA

Top view

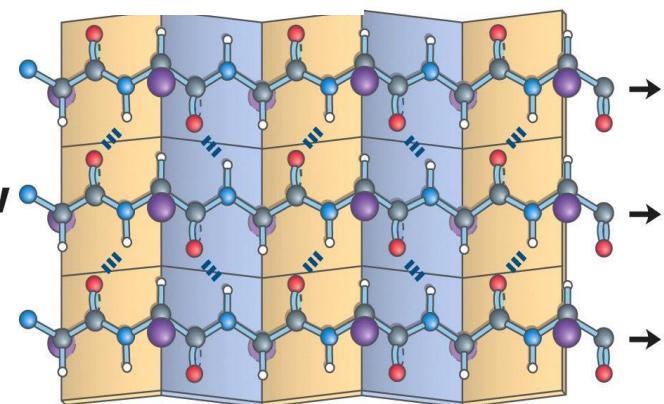


Side view

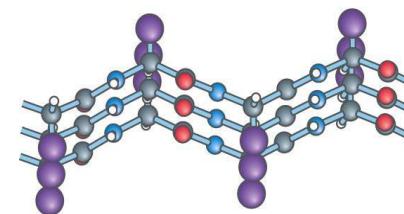


PARALELNA

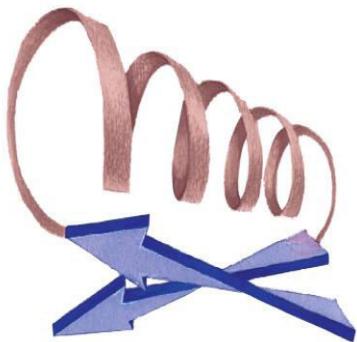
Top view



Side view



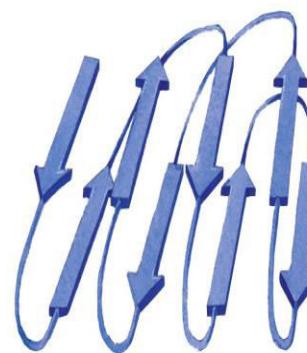
Super-sekundarna struktura



β - α - β Loop



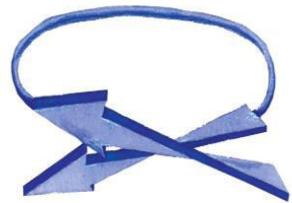
α - α Corner



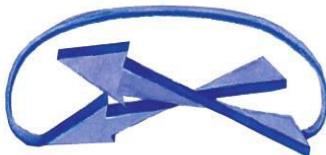
**Typical connections
in an all- β motif**



**Crossover connection
(not observed)**



**Right-handed connection
between β strands**



**Left-handed connection
between β strands
(very rare)**



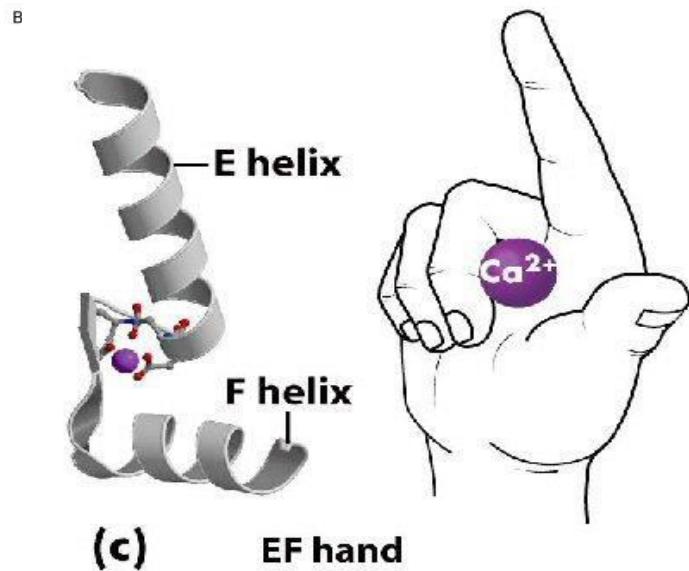
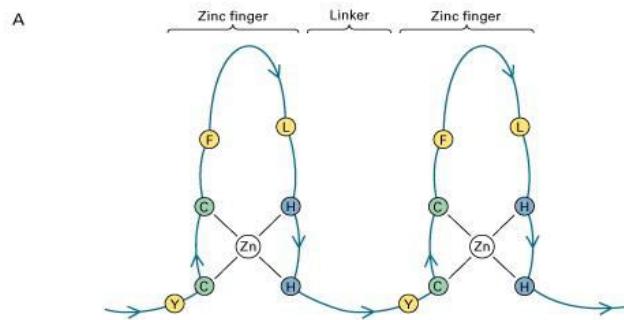
β Barrel



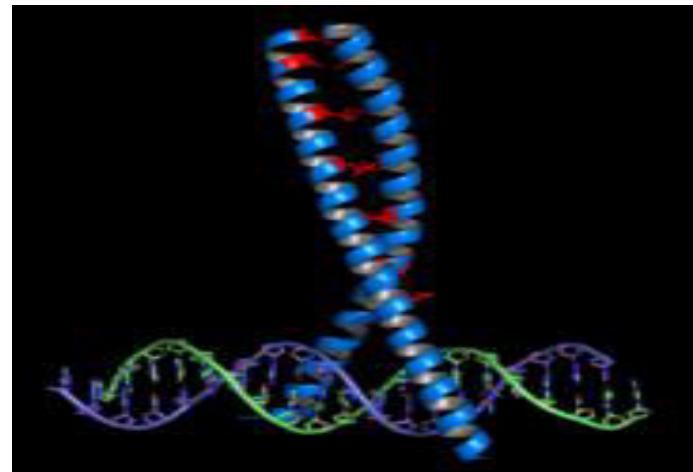
Twisted β sheet

TERCIJARNA STRUKTURA

Zn prst

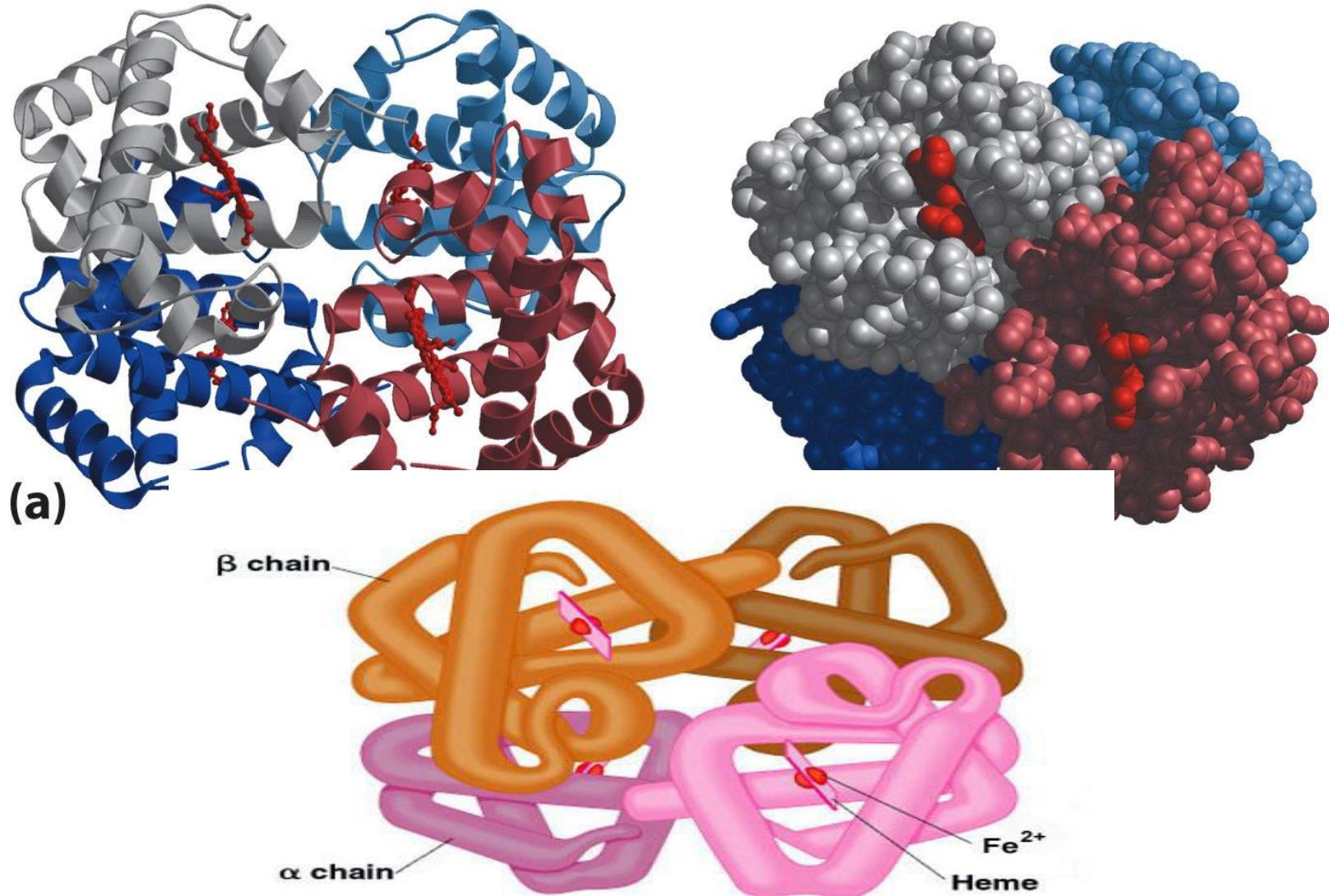


Leucin-zipper



EF ruka

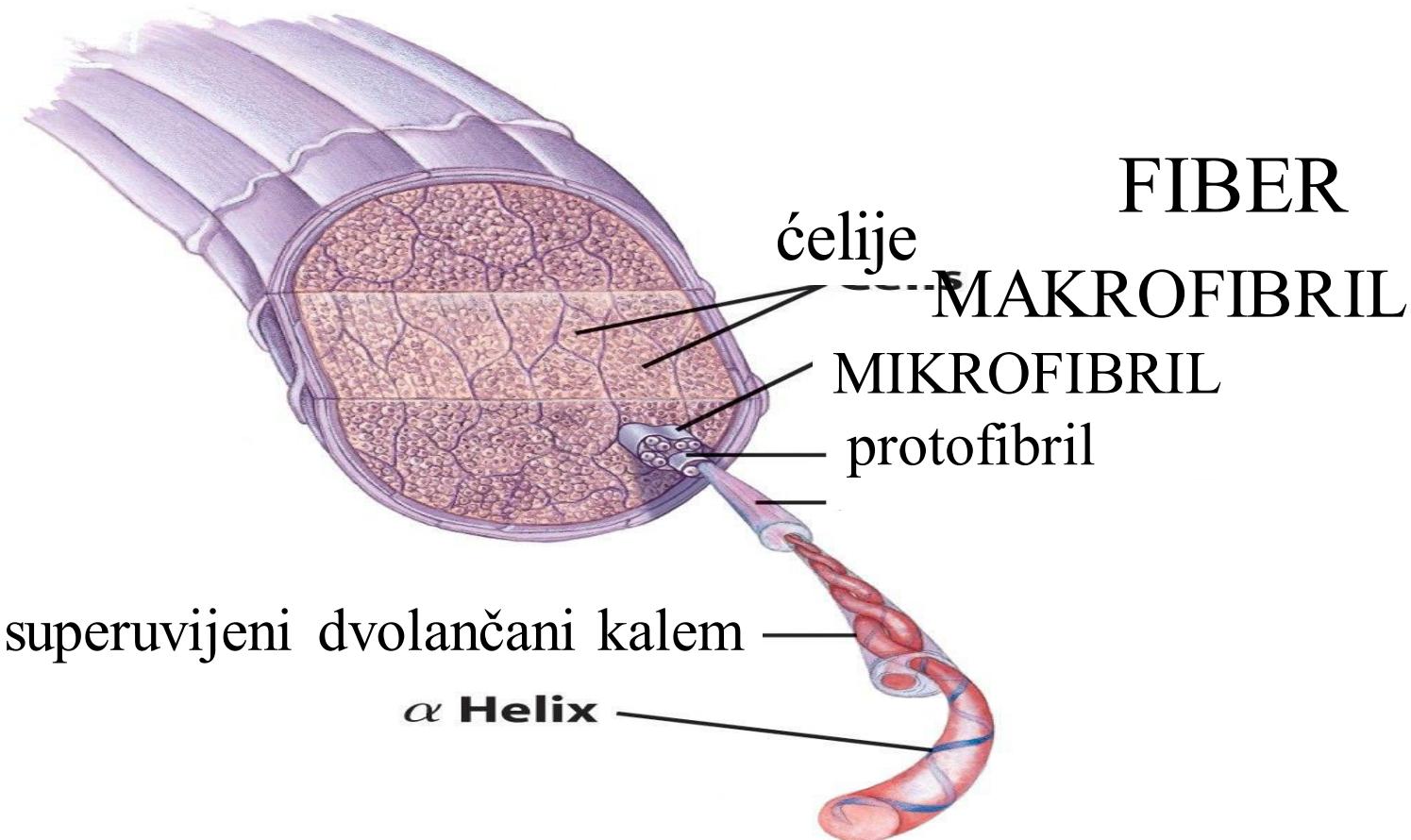
Kvaternarna struktura deoksihemoglobin



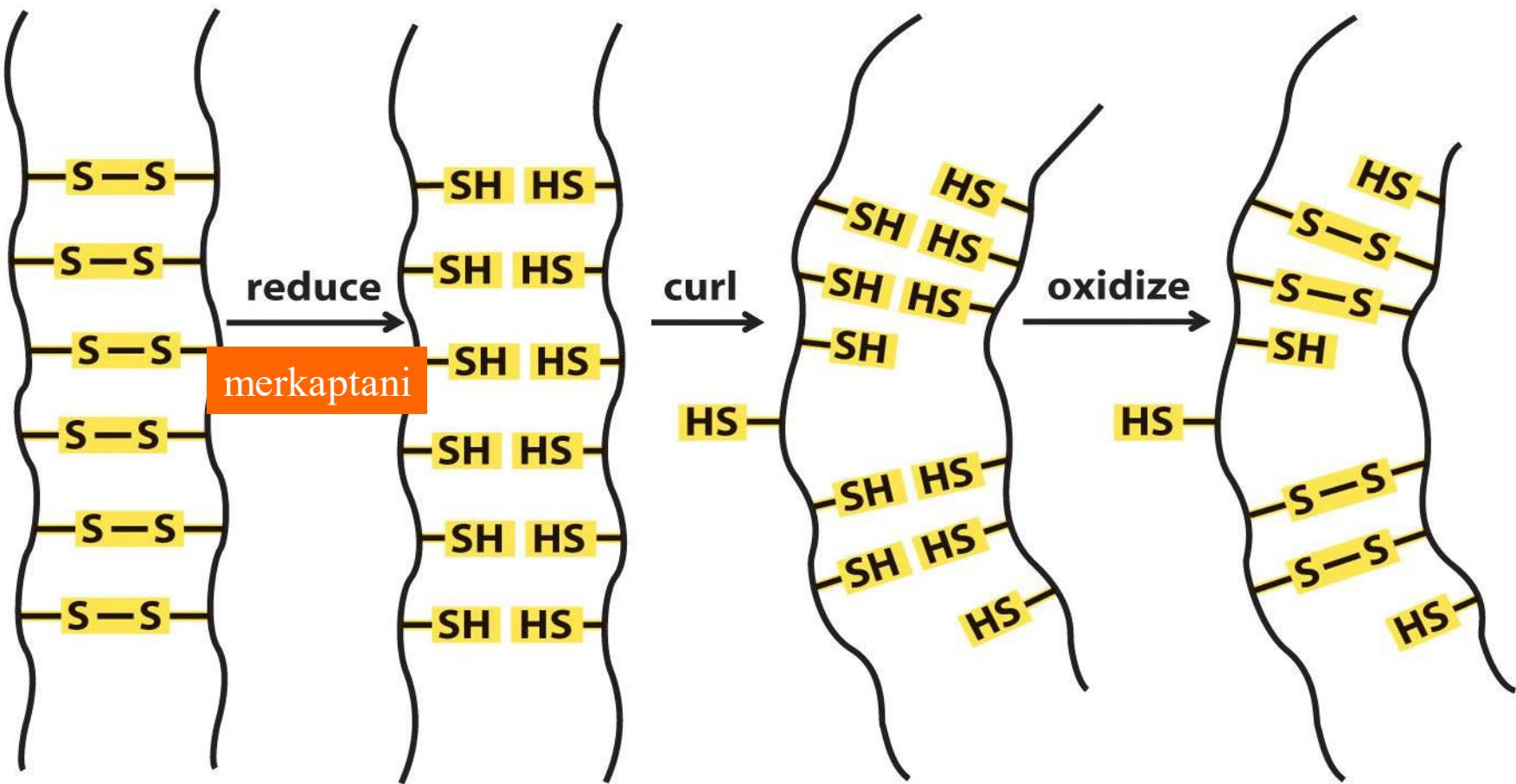
FIBRILARNI PROTEINI

α -Keratin

Presek dlake



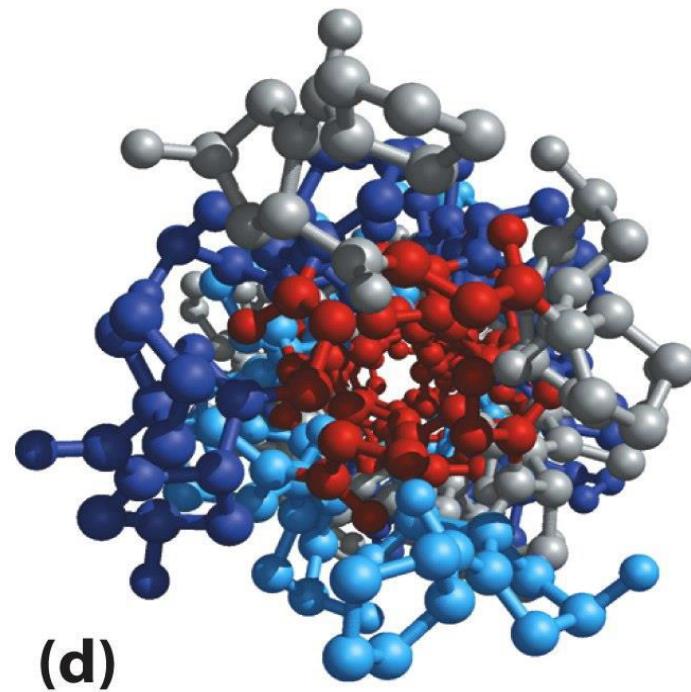
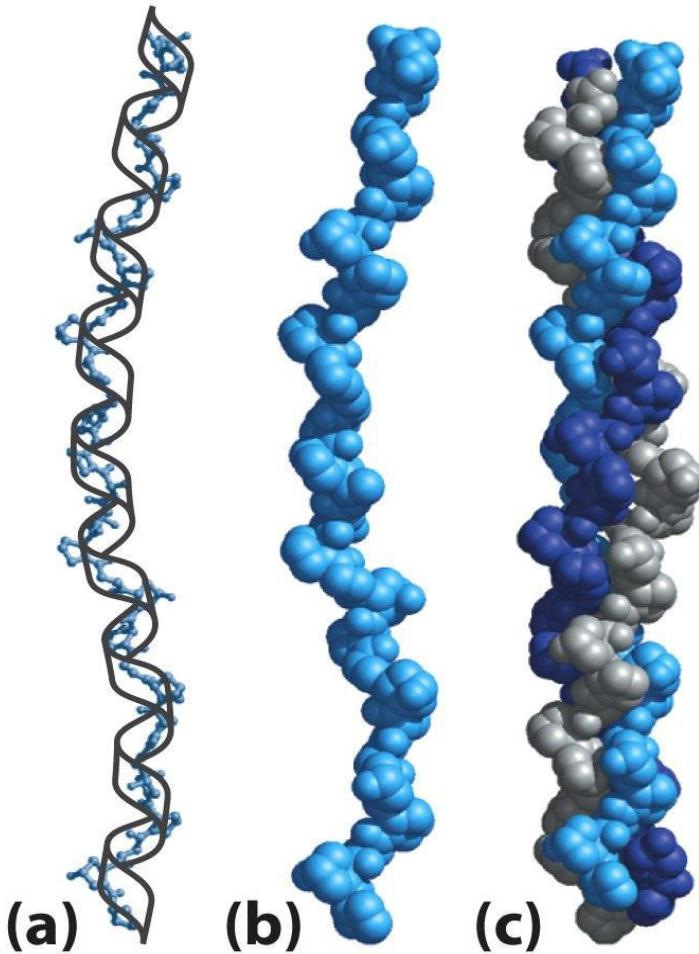
“MINI-VAL”, “TRAJNA”



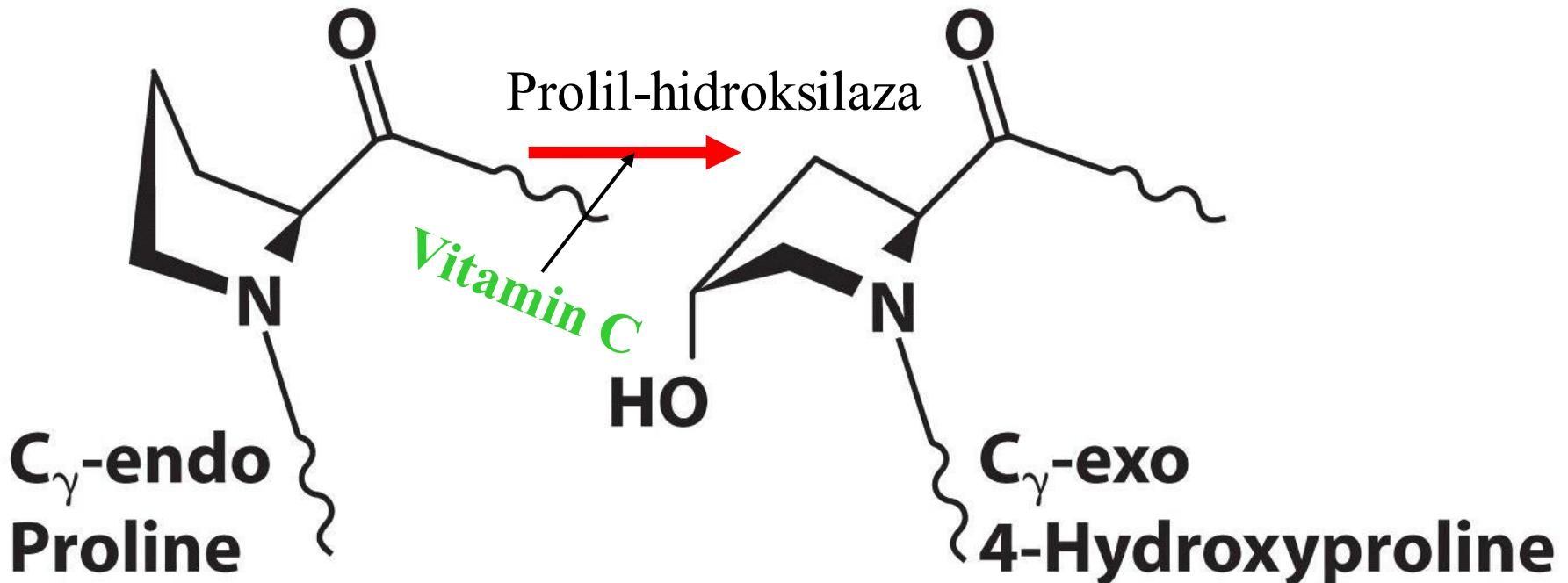
MOLJCI!

KOLAGEN

GLICIN PROLIN HIDROOKSI PROLIN



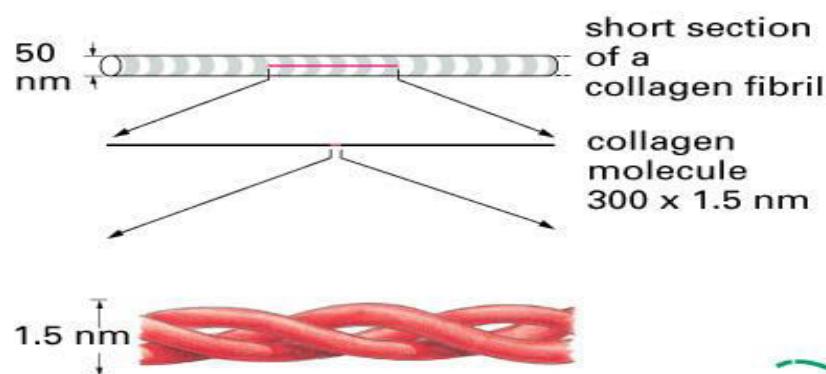
Hidroksilacija prolina



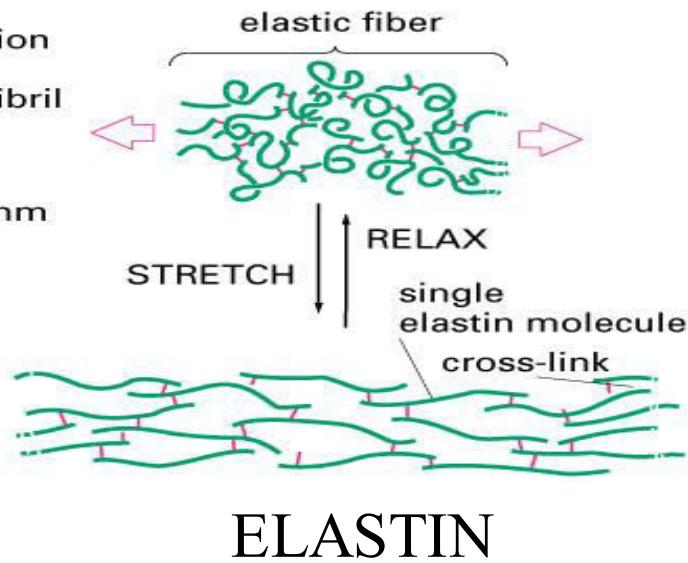
skorbut

ELASTIN

GLICIN ALANIN VALIN

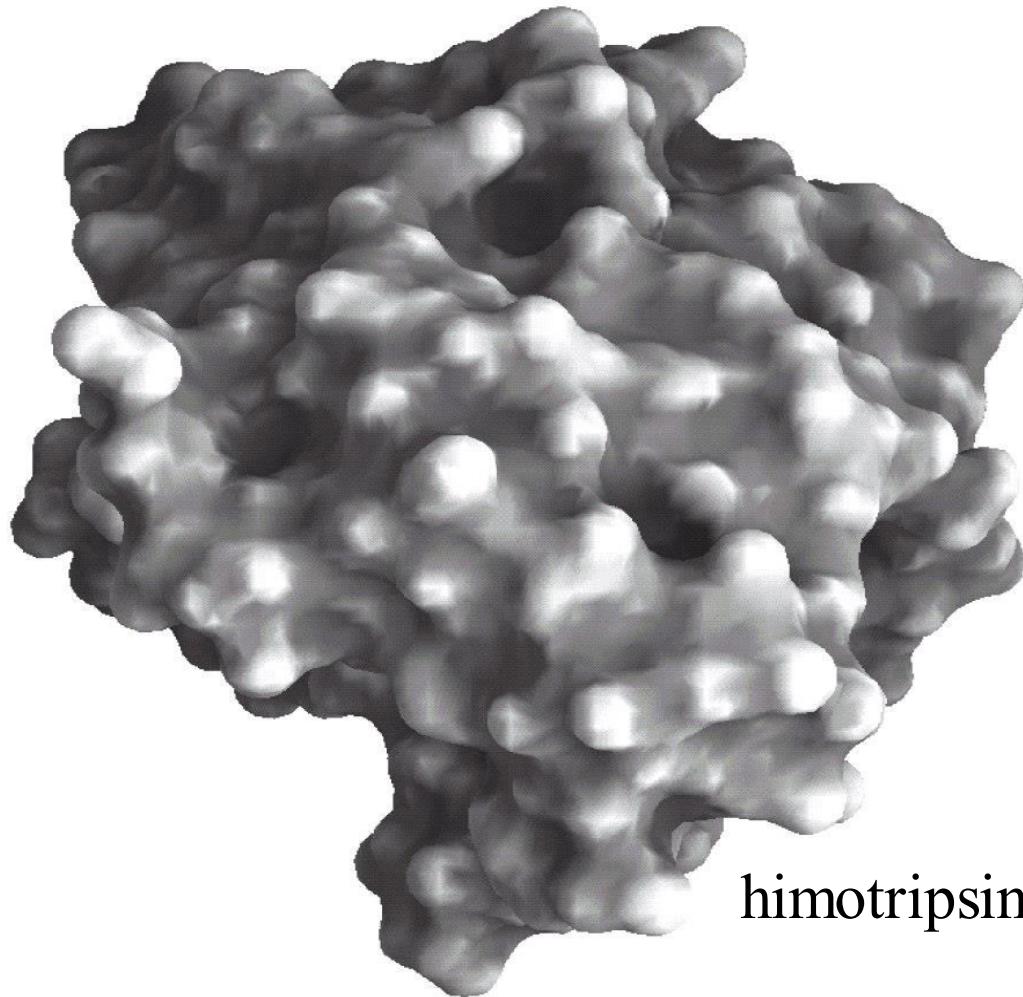


KOLAGEN



GLOBULARNI PROTEINI

Struktura globularnog proteina



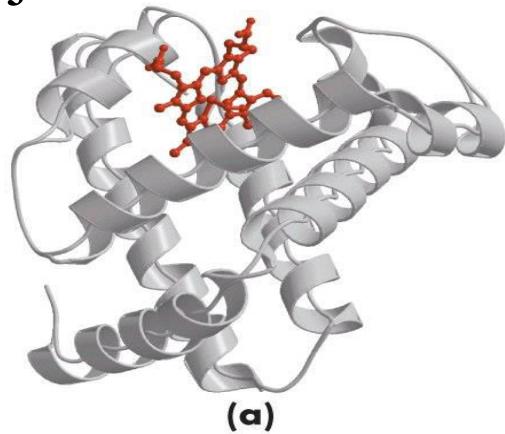
himotriptsin

HEMPROTEINI

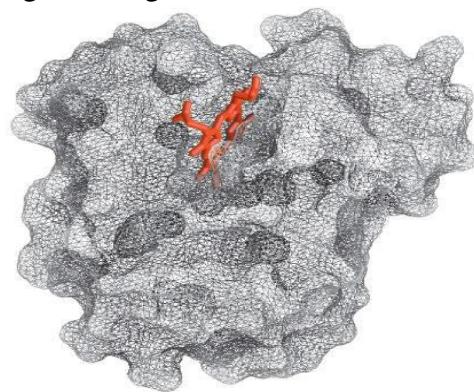
MIOGLOBIN

(Mr 16,700; 153 AK),

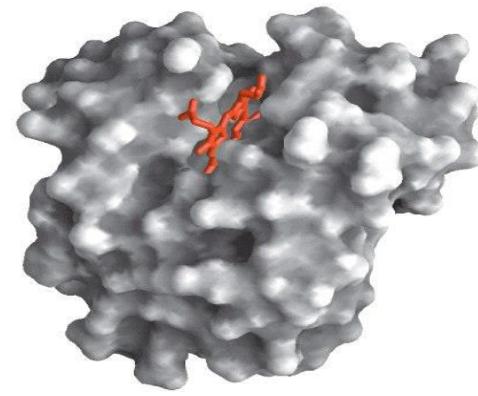
8 α -helikoidnih domena + nehelikoidni segmenti – β okreti
najveći domen 23 AK, najmanji 7 AK.



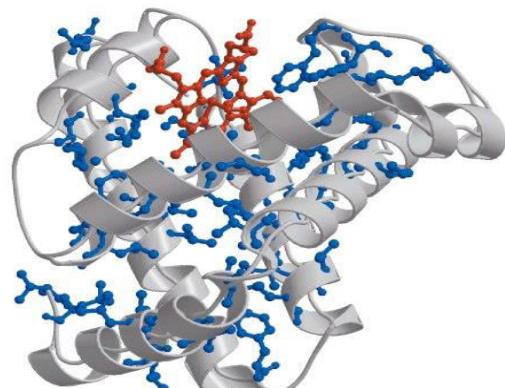
(a)



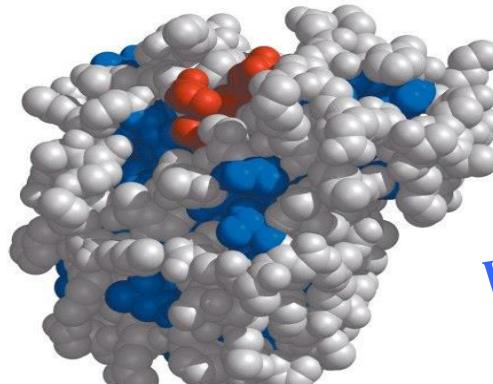
(b)



(c)



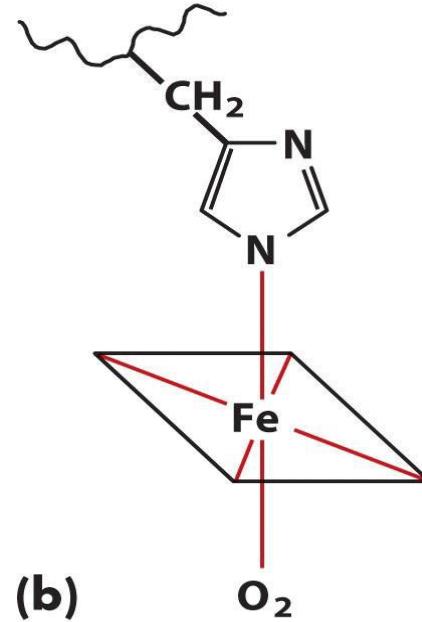
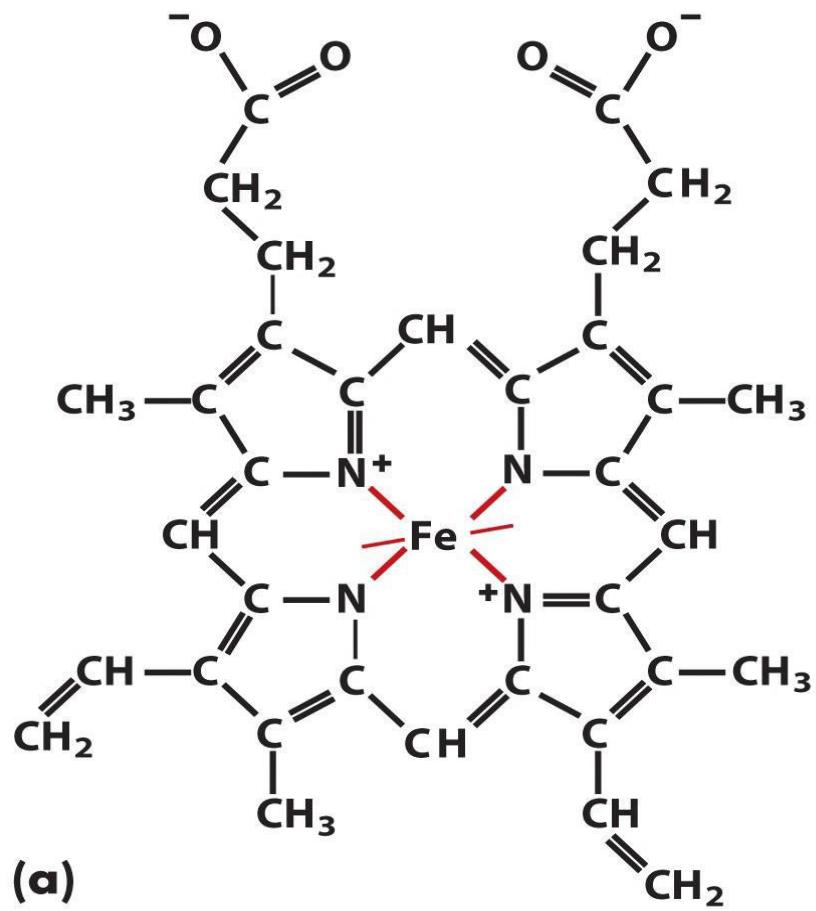
(d)



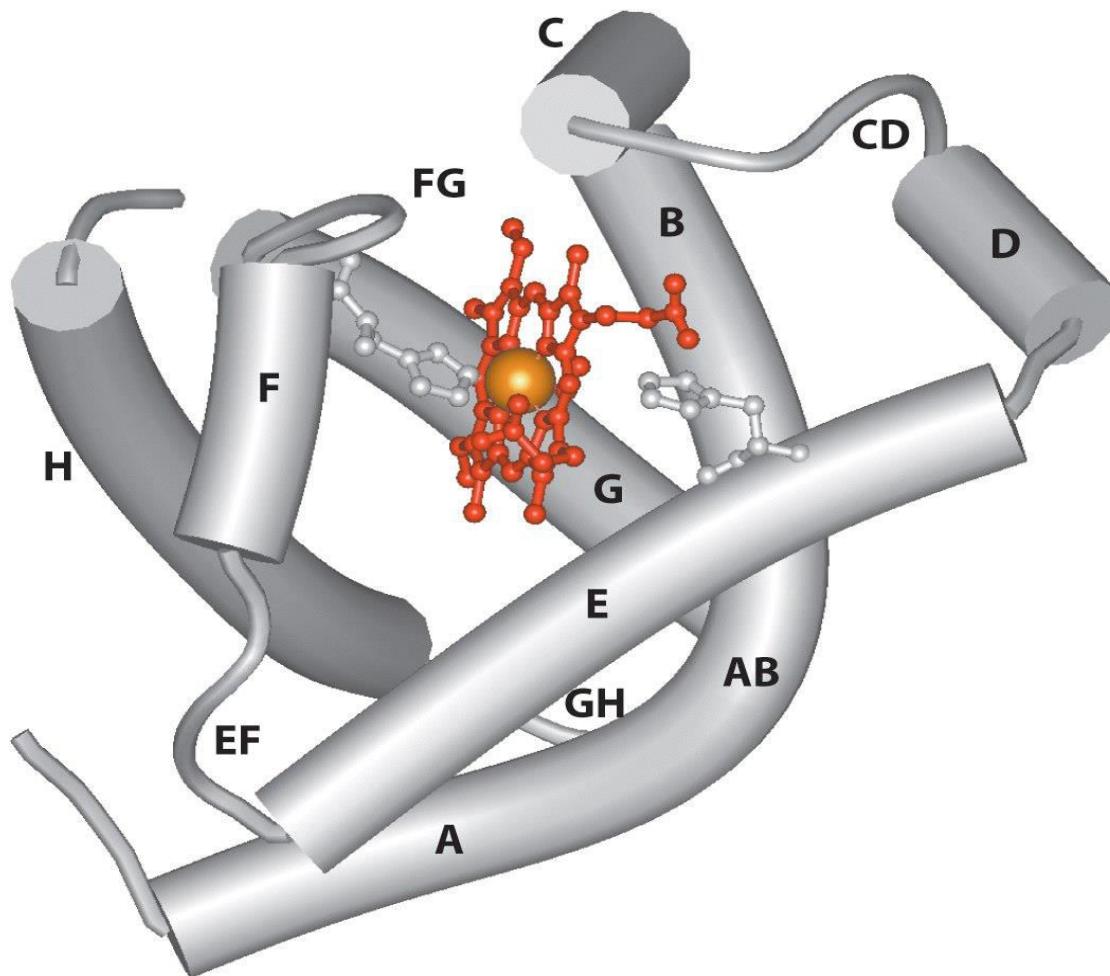
(e)

Veza između strukture i funkcije

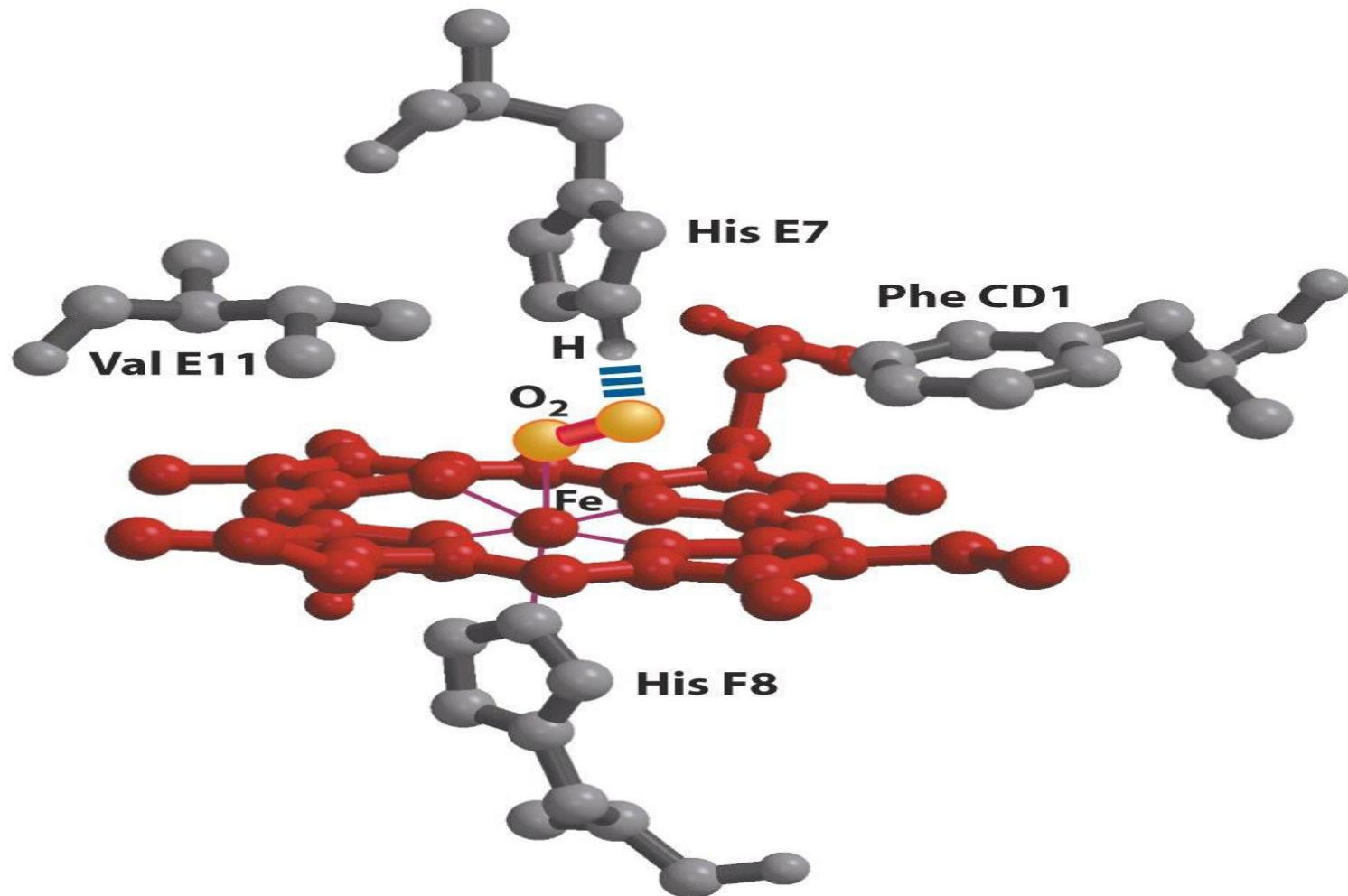
HEM



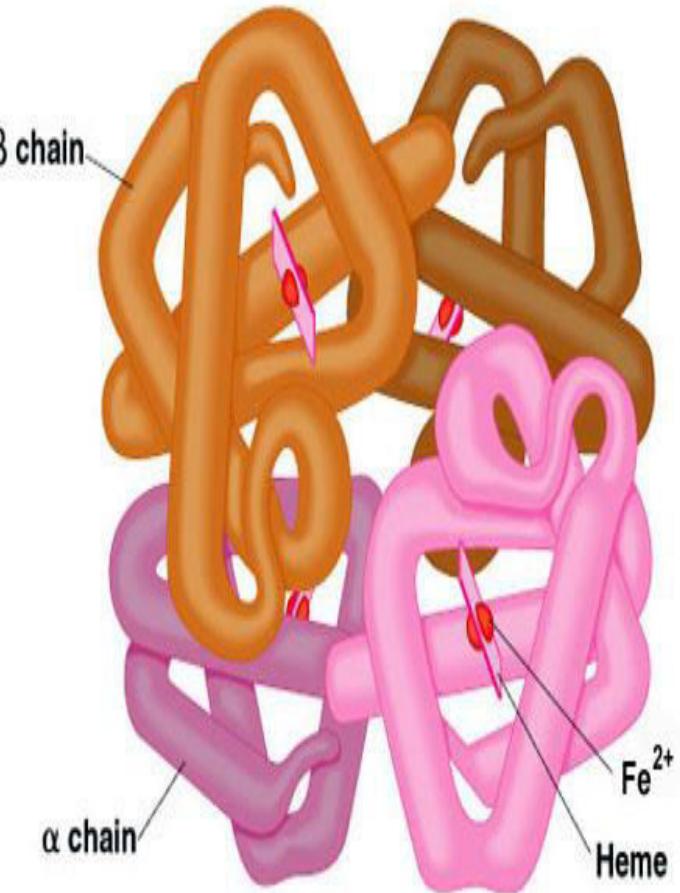
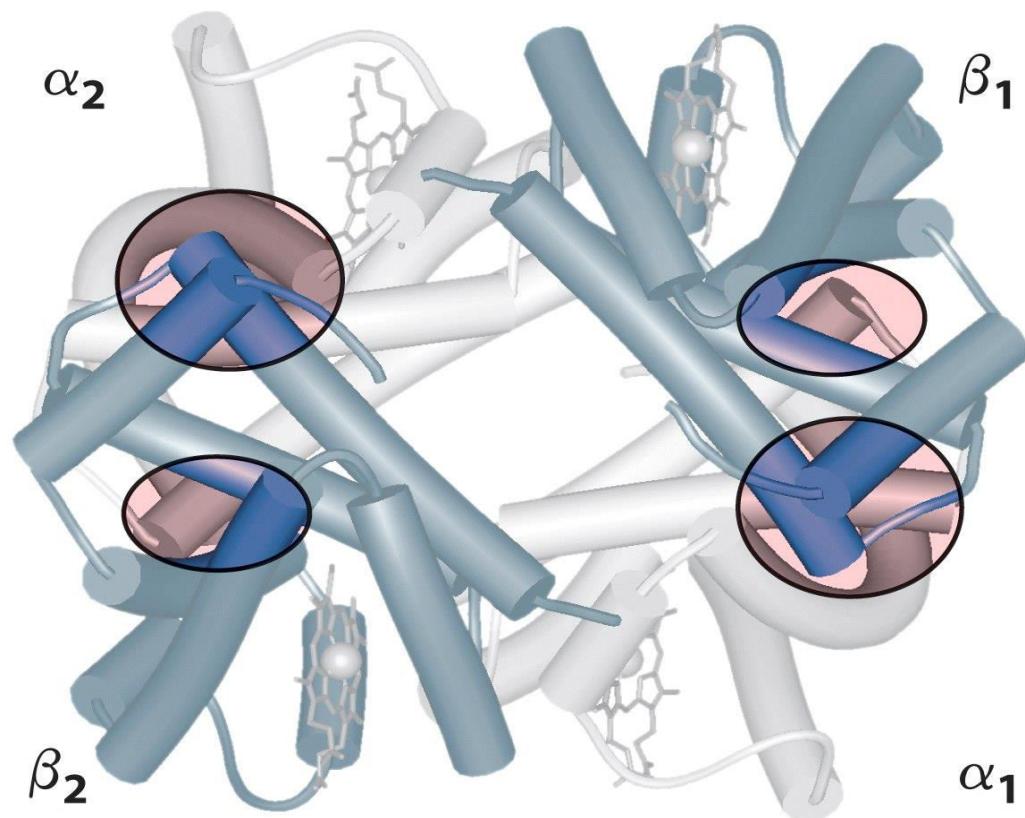
STRUKTURA MIOGLOBINY

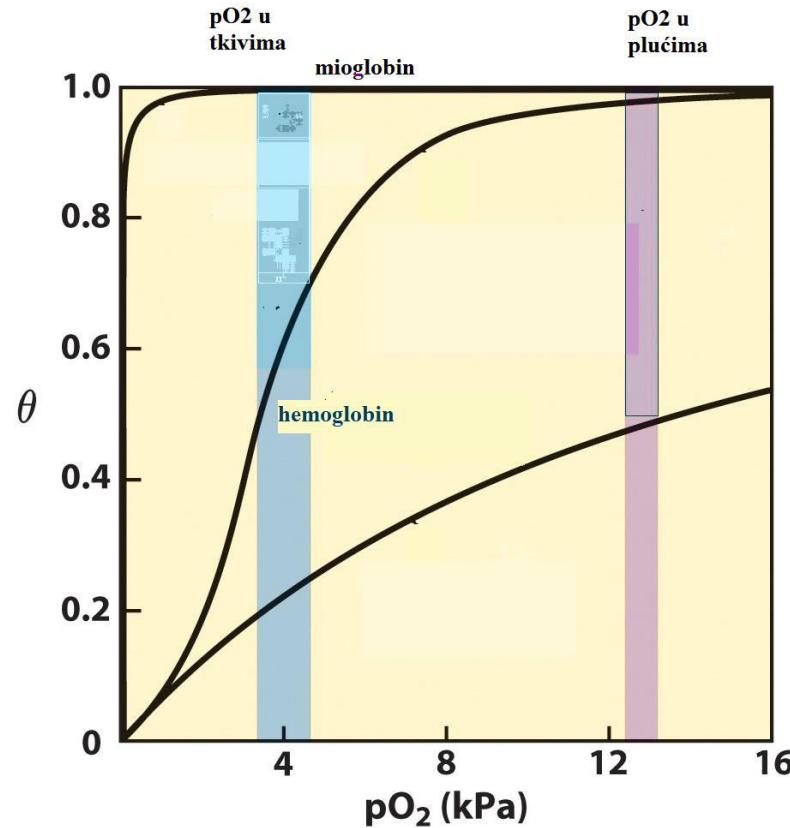


Sterni efekti vezivanja liganda za hem mioglobina



Subjedinice hemoglobina





BOROV EFEKAT

2.3-DIFOSFOGLICERAT

FIZIČKO-HEMIJSKE OSOBINE PROTEINA

REKAPITULACIJA -PITANJA

1. Zaokruži NETAČNE tvrdnje:

- a. Peptidna veza ima karakteristike delimično dvostrukih veza.
- b. Antiparalelna β -presavijena ploča je manje stabilna struktura od paralelne β -presavijene ploče.
- c. Povezivanjem protomera (subjedinica) nastaje tercijerna struktura oligomernih proteina.
- d. Za sintezu hidroksiprolina, koji ulazi u sastav kolagena, neophodan je vitamin B.

2. Koje su karakteristike α -heliksa TAČNE ?

- a. prolin omogućava stvaranje α -heliksa
- b. aminokiseline grade vodonične veze u α -heliku
- c. u jednom okretu nalazi se 3,6 aminokiselinskih ostataka
- d. α -heliks je energetski bogata struktura koja je nestabilna
- e. svi poznati α -heliksi u prirodi su desnostrani

3. 2,3-difosfoglicerat je alosterni modulator funkcije hemoglobina koji ima sledeća svojstva:

- a. povećava afinitet hemoglobina za kiseonik.
- b. smanjuje afinitet hemoglobina za kiseonik.
- c. vezuje se za β -lance hemoglobina jonskim vezama
- d. vezuje se za α -lance hemoglobina vodoničnim vezama

4. Zaokruži NETAČNU tvrdnju:

- a. Peptidna veza je planarna i ne može slobodno da rotira.
- b. Početak polipeptidnog lanca je onaj kraj na kome se nalazi aminokiselina koja ima slobodnu karboksilnu grupu.
- c. Super-sekundarna struktura proteina nastaje kombinacijom α -heliksa, β -presavijenih ploča i struktura koje se ne ponavljaju.