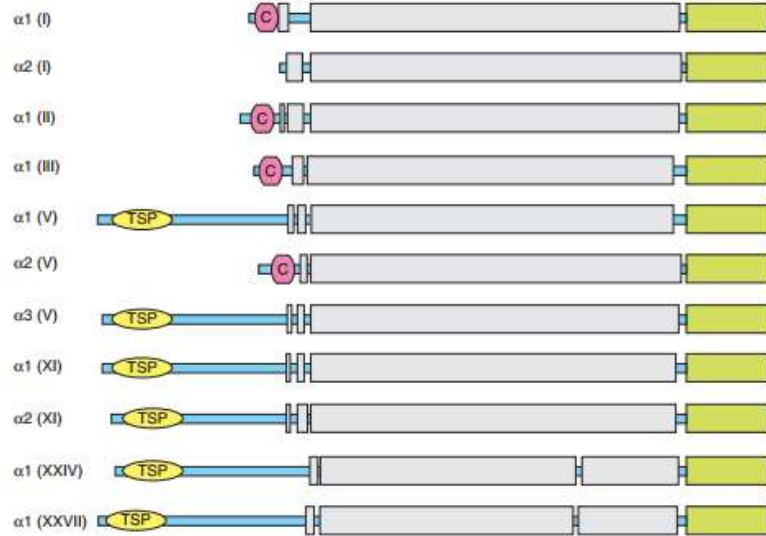
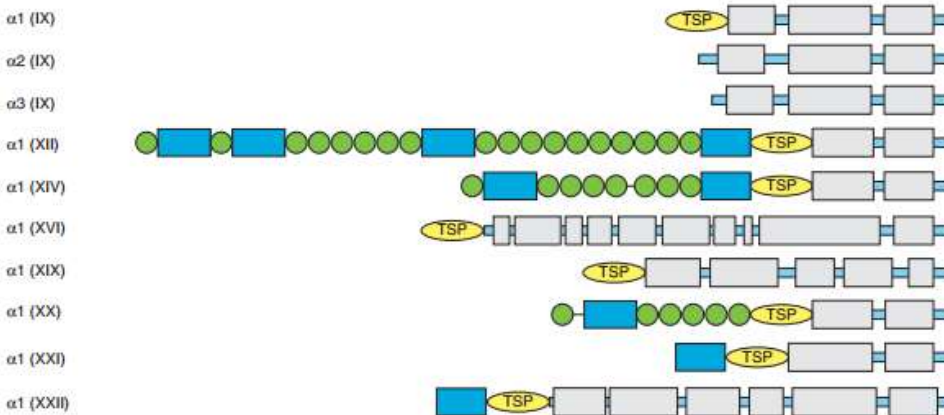


# Fibrilarni proteini - kolageni

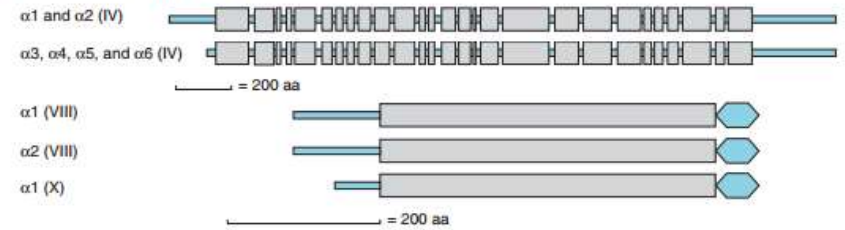
## Fibril-forming collagens



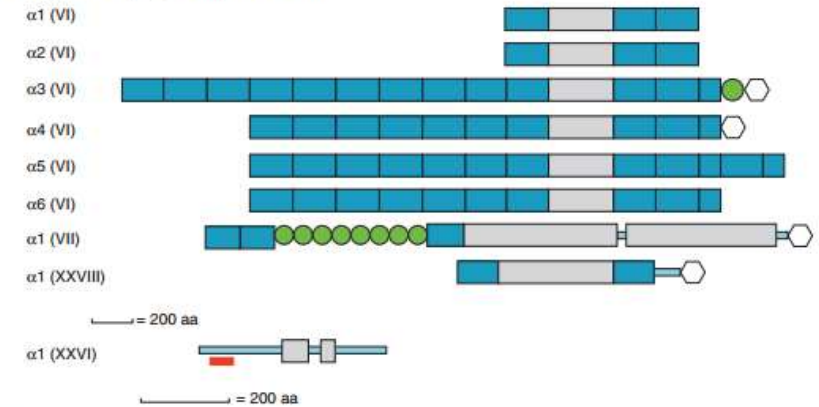
## Fibril-associated collagens with interrupted triple helices



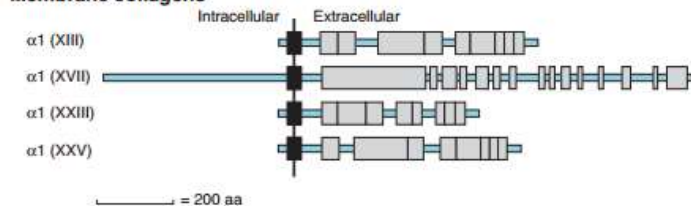
## Network-forming collagens



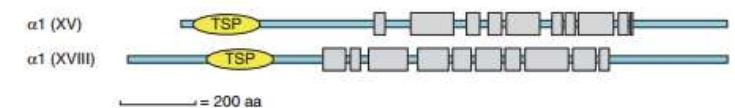
## Collagens VI, VII, XXVI, and XXVIII



## Membrane collagens



## Multiplexins (collagens XV and XVIII)

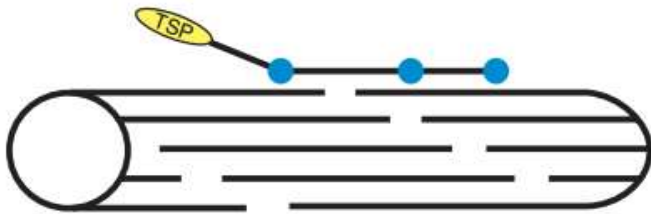


# Fibrilarni proteini - kolageni

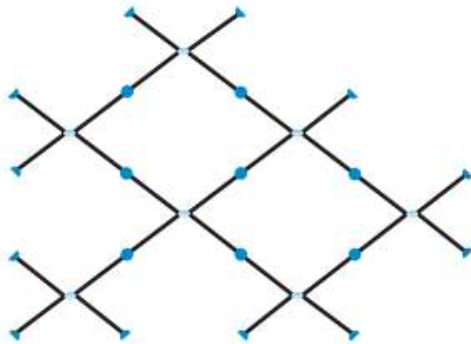
Fibrils



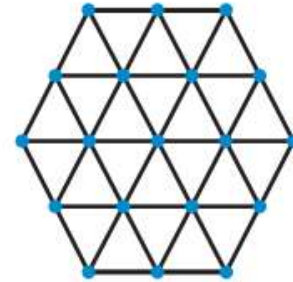
FACITs (collagen IX)



Network (collagen IV)



Hexagonal networks (collagens VIII and X)



Beaded filaments (collagen VI)

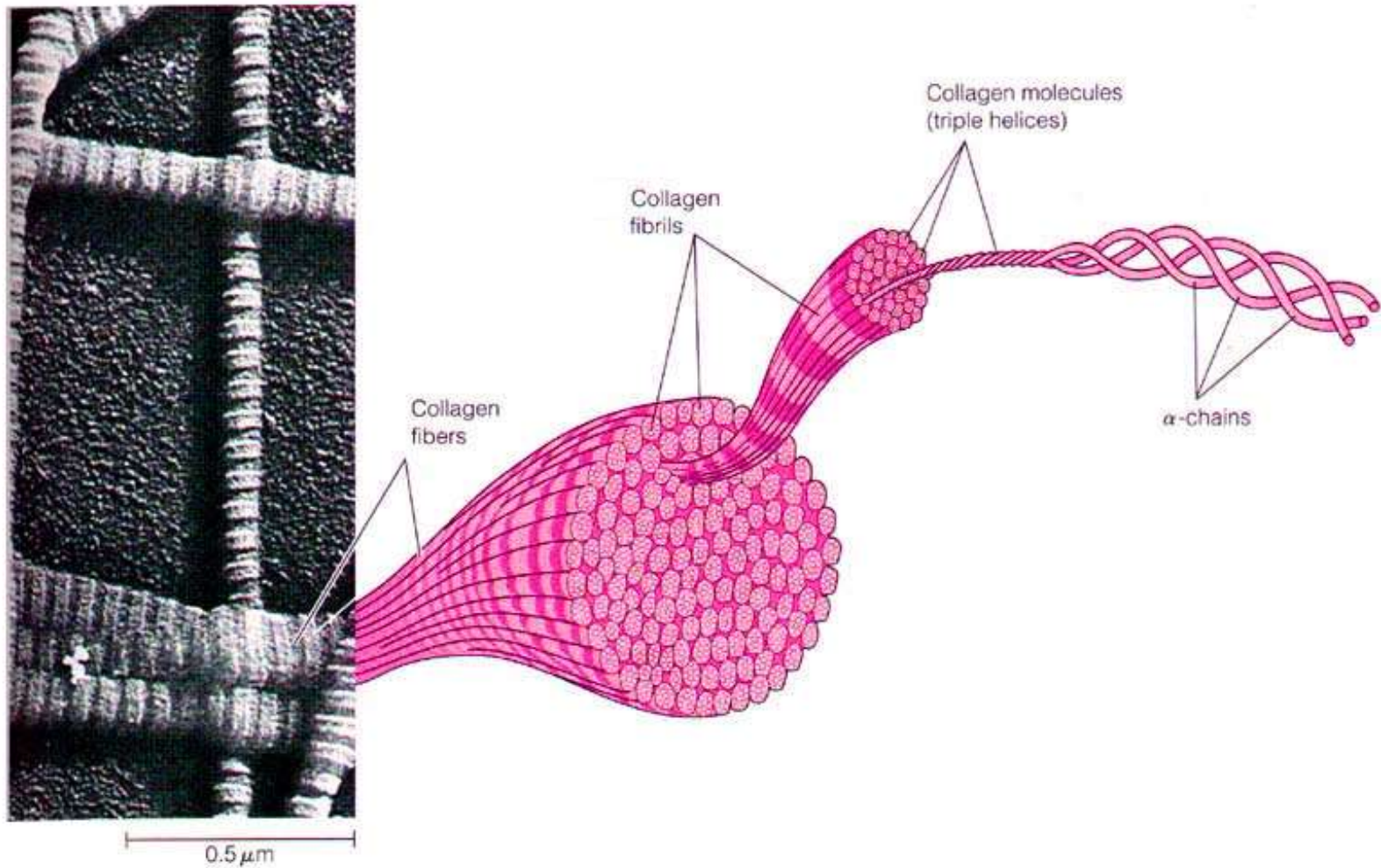


Anchoring fibrils (collagen VII)



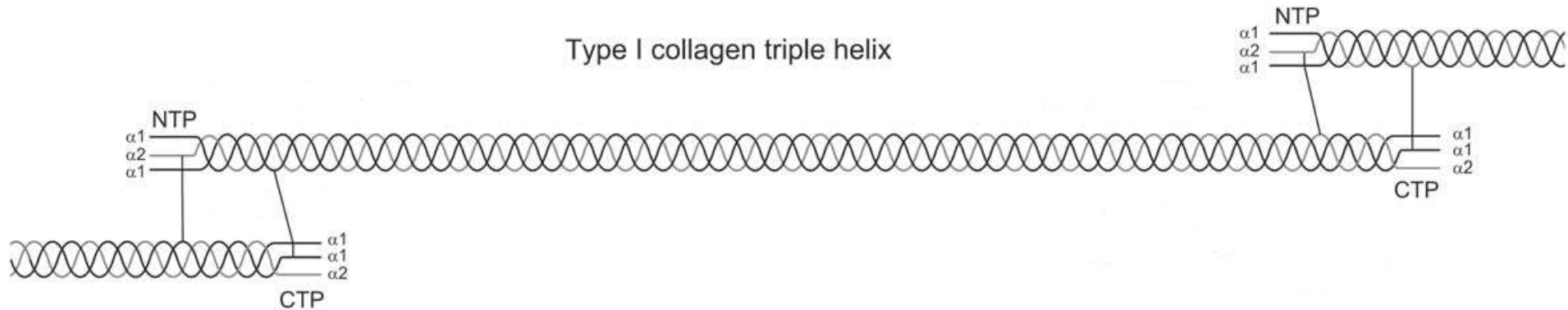
- Non-collagenous domain
- Triple-helical domain (Gly-X-Y)
- TSP Thrombospondin domain

# Fibrilarni proteini - kolageni



# Fibrilarni proteini - kolageni

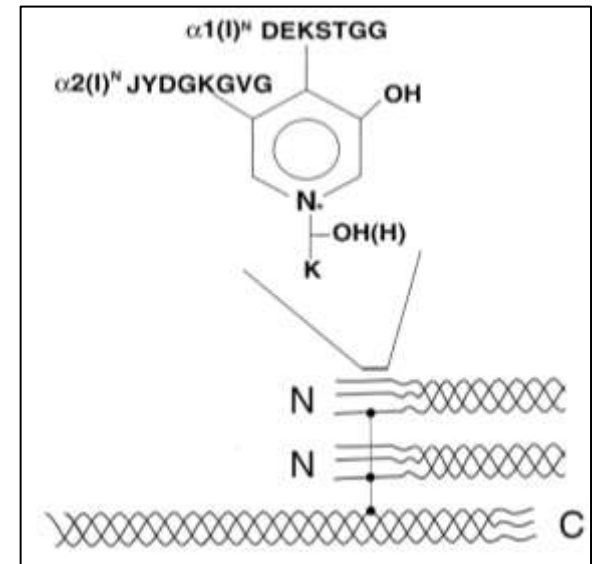
Type I collagen triple helix



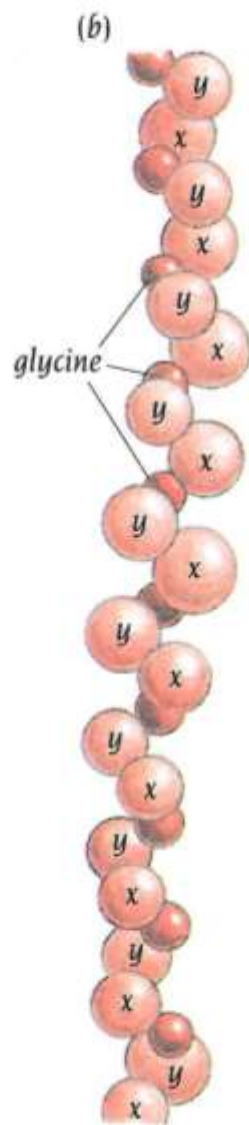
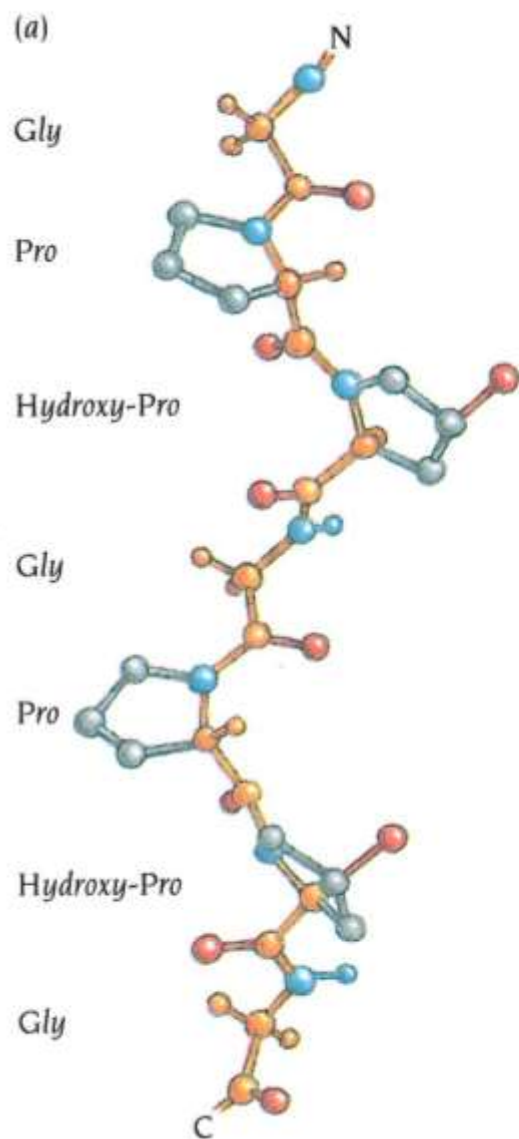
Dolžina molekule 3000 Å

Trojna vijačnica je dolga okoli 1000 ostankov

N-končni telopeptid (NTP) in C-končni telopeptid (CTP) dolga 10-20 ostankov – kovalentna prečna povezava treh verig.



# Fibrilarni proteini - kolageni

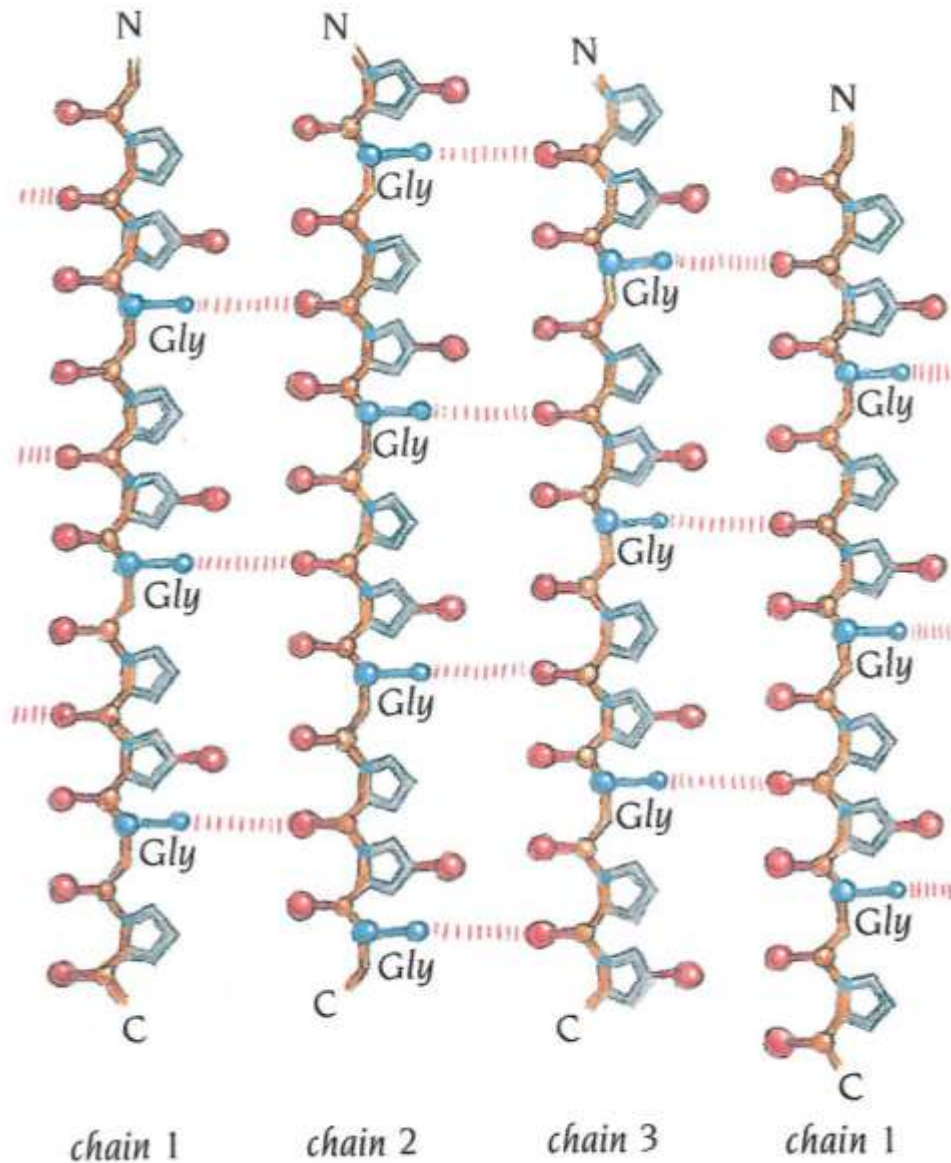


## poliprolinska vijačnica tipa II

levosučna vijačnica  
3,3 ostanka na zavoju  
9,6 Å dvig na zavoju

vzorec trojne vijačnice se  
ponovi na 100 Å.

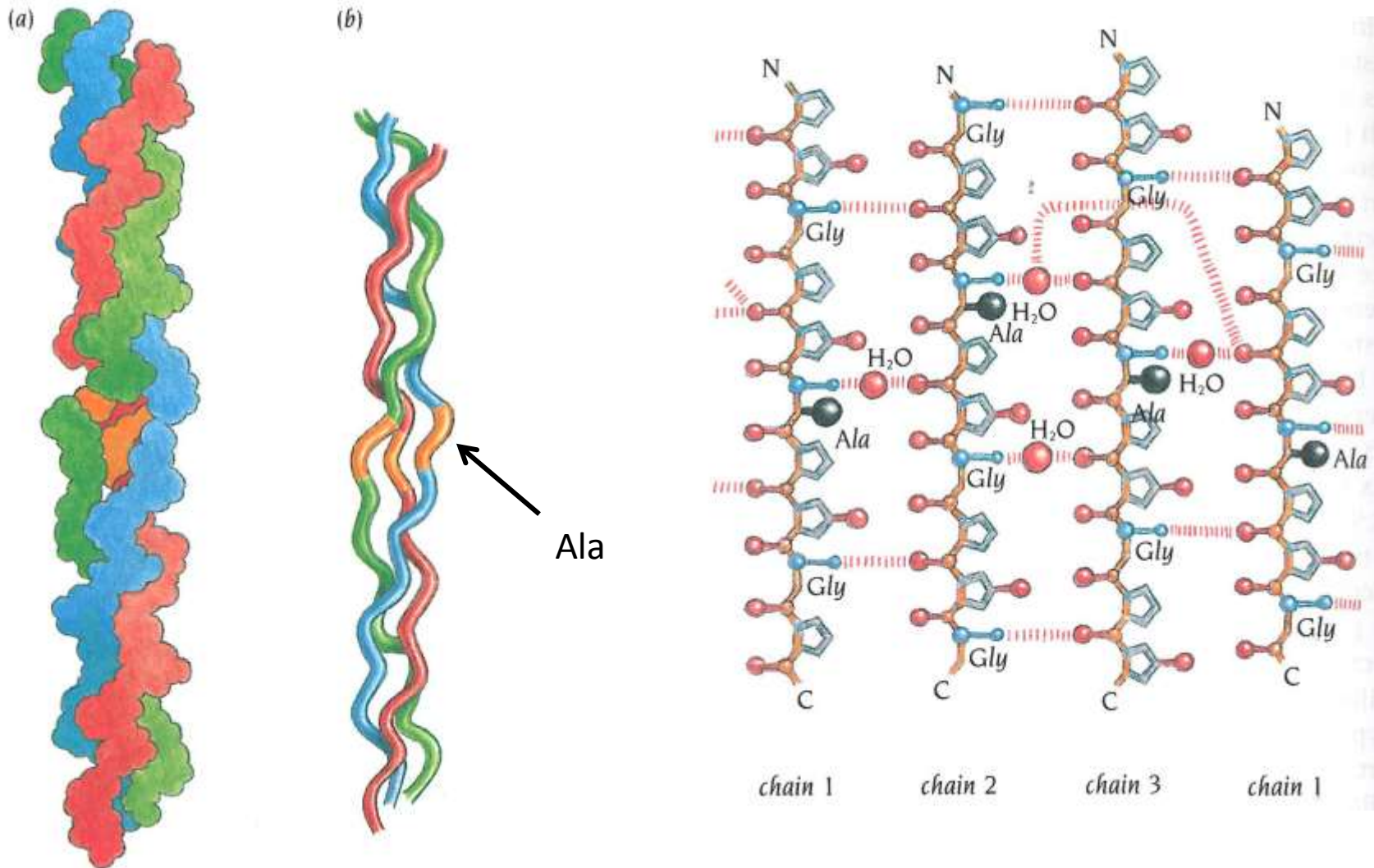
# Fibrilarni proteini - kolageni



Trojna vijačnica je stabilizirana z vodikovimi vezmi.

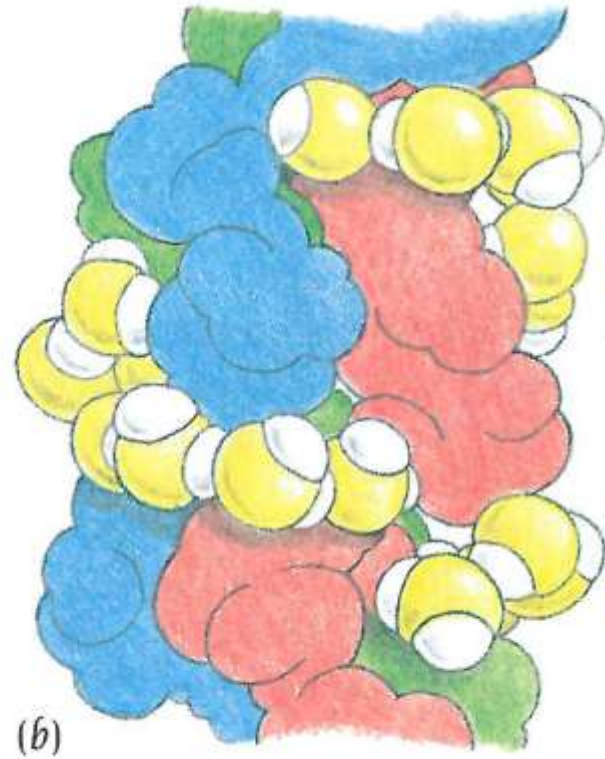
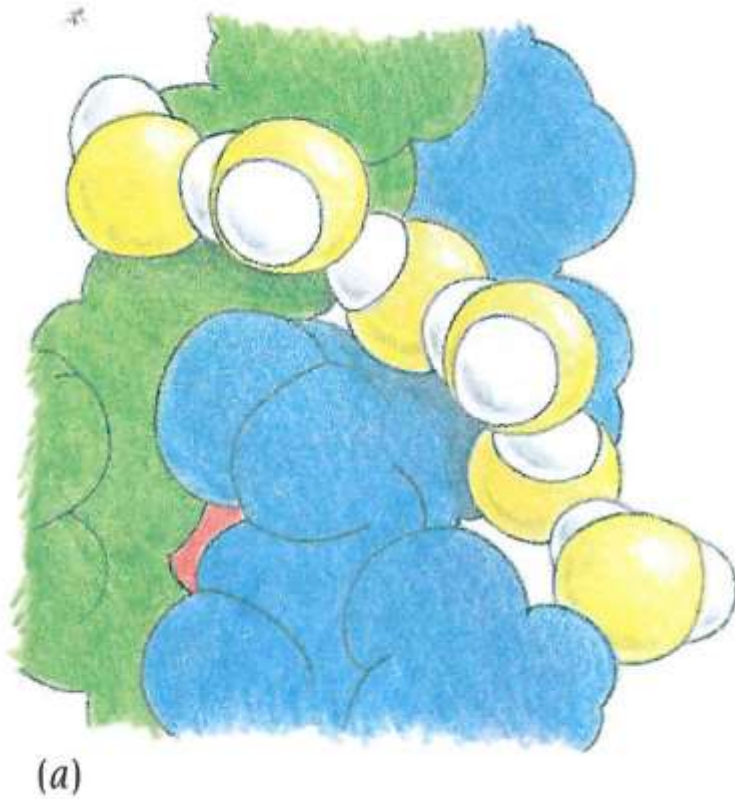
# Fibrilarni proteini - kolageni

Zamenjava Gly ostanka z Ala izkrivi geometrijo trojne vijačnice in prekine redni vzorec H-vezi. To se kompenzira s H-vezmi preko molekul vode.



## Fibrilarni proteini - kolageni

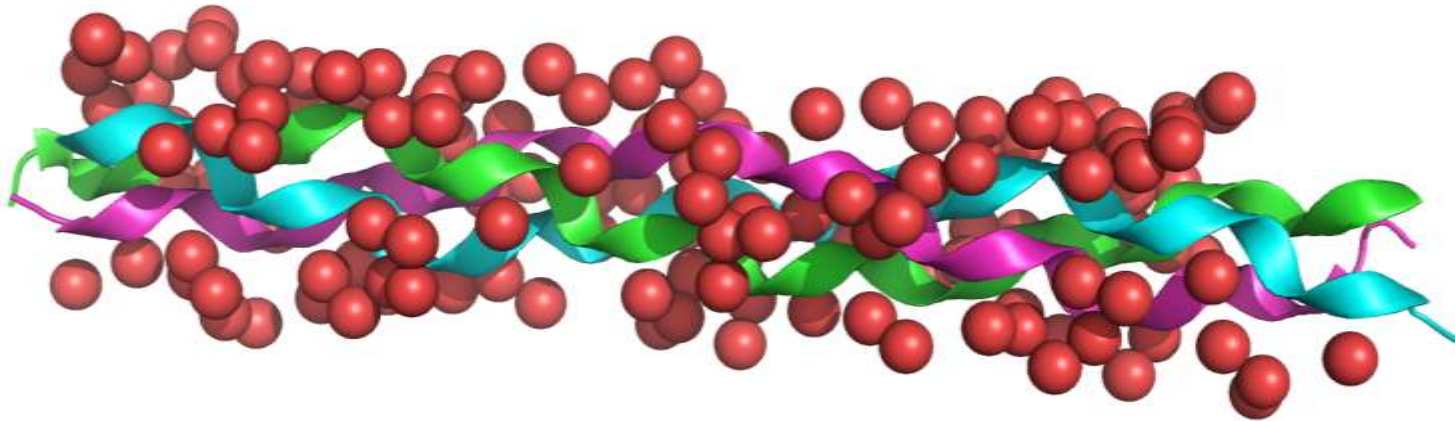
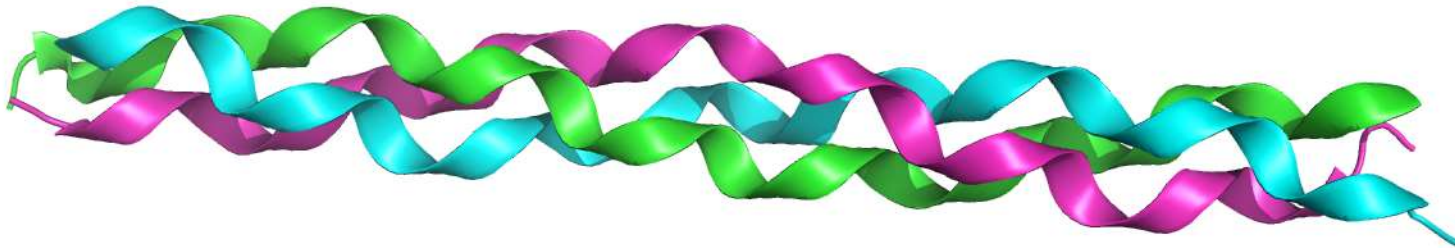
Molekule kolagena so v raztopini dodatno stabilizirane z vodnim ovojem, ki posreduje pri H-vezeh med stransko skupino Hyp in atomi glavnih verig.





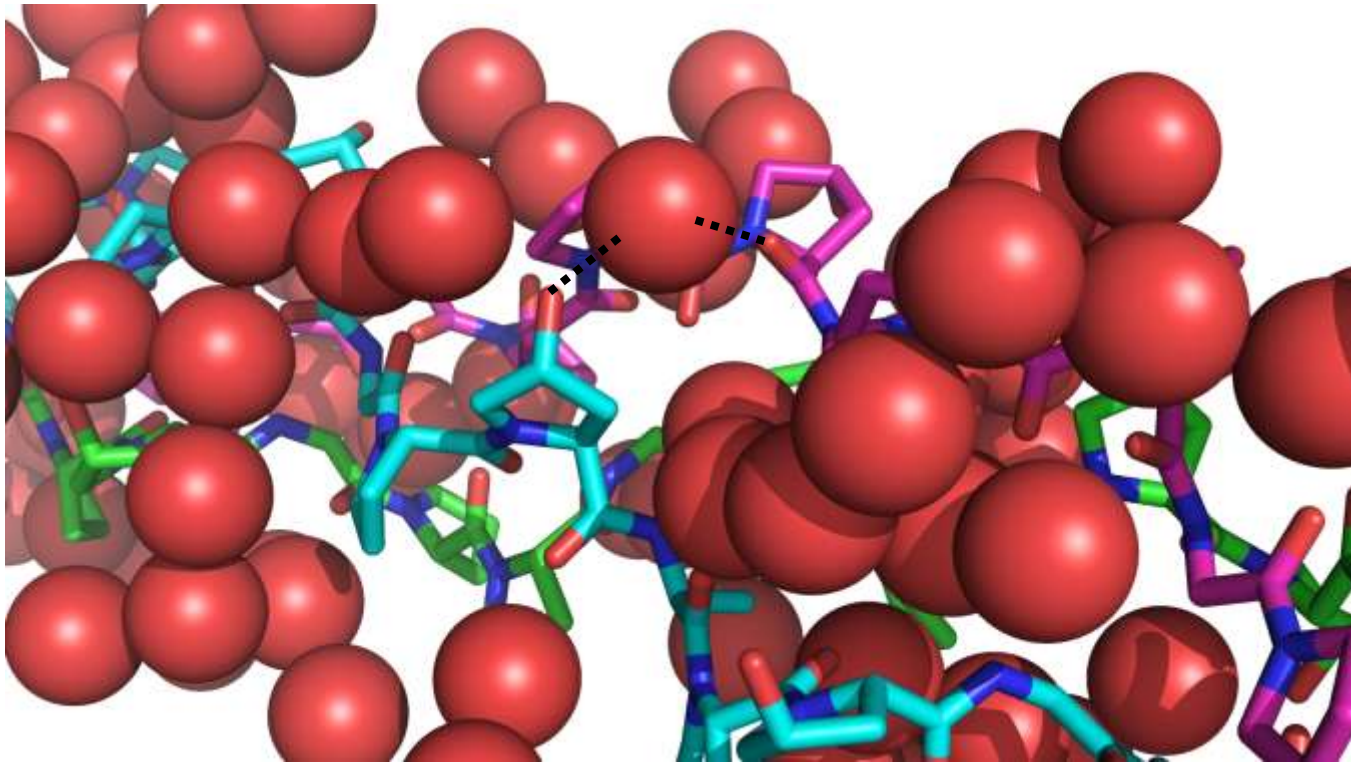
# Fibrilarni proteini - kolageni

Molekule kolagena so v raztopini dodatno stabilizirane z vodnim ovojem, ki posreduje pri H-vezeh med stransko skupino Hyp in atomi glavnih verig (C=O in N-H).



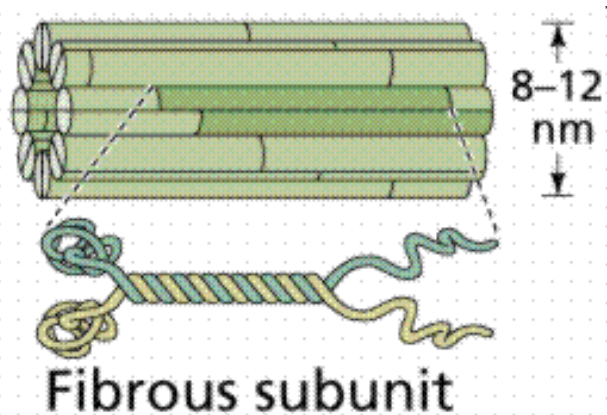
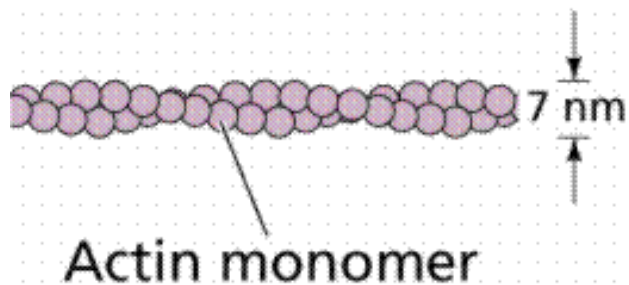
# Fibrilarni proteini - kolageni

Molekule kolagena so v raztopini dodatno stabilizirane z vodnim ovojem, ki posreduje pri H-vezeh med stransko skupino Hyp in atomi glavnih verig (C=O in N-H).



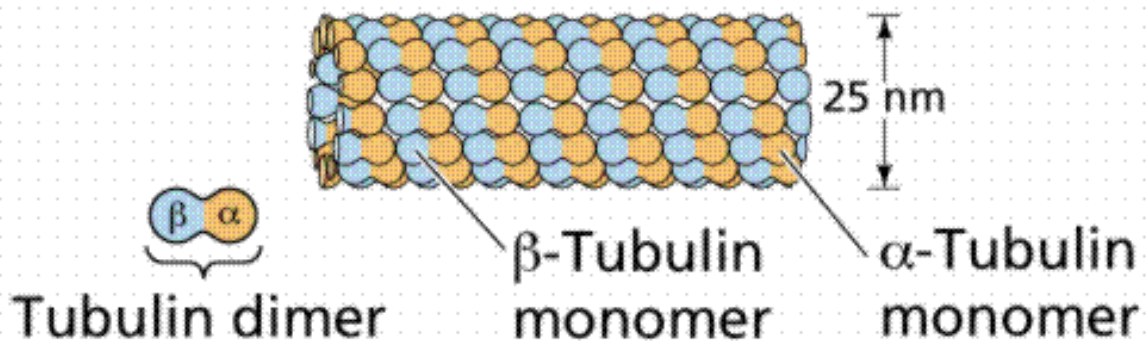
# Fibrilarni proteini - citoskelet

aktinski  
filamenti



intermediarni  
filamenti  
so iz keratinov.

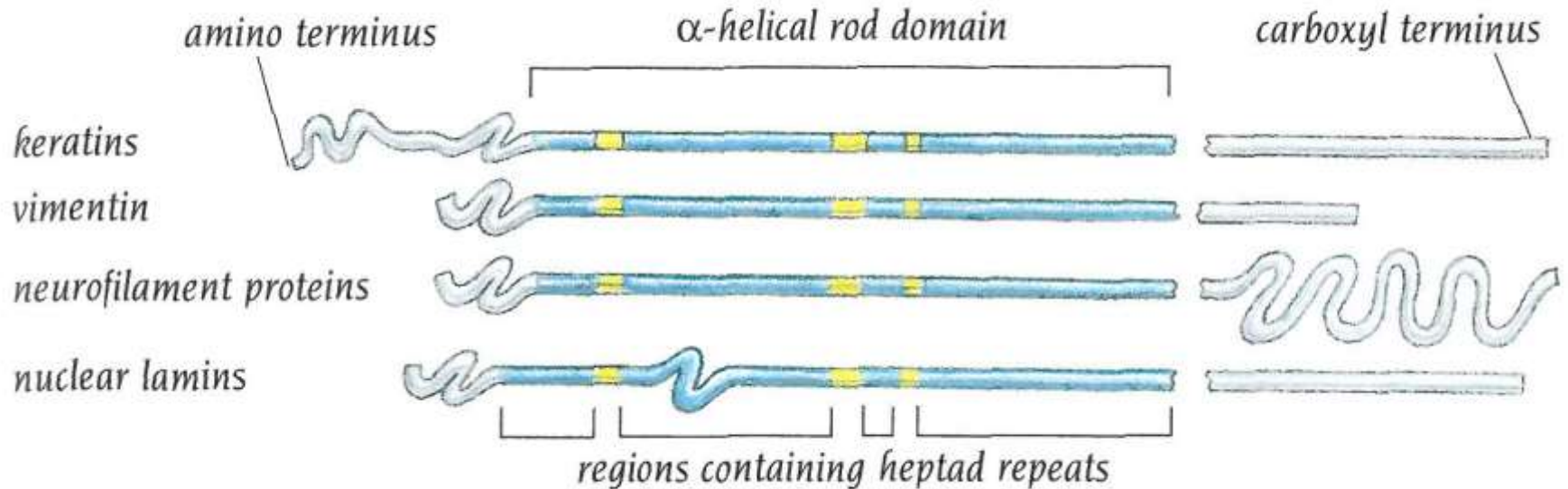
mikrotubuli



# Fibrilarni proteini – intermediarni filamenti

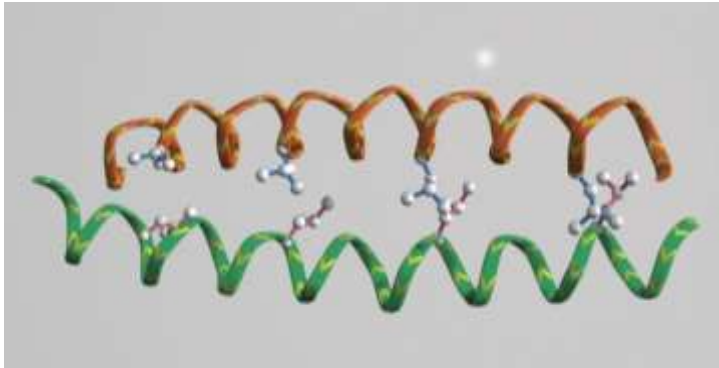
Intermediarne filamente sestavljajo produkti okoli 60 genov. Skupna jim je tvorba ovite vijačnice.

Domenske organizacije monomerov intermediarnih filamentov:

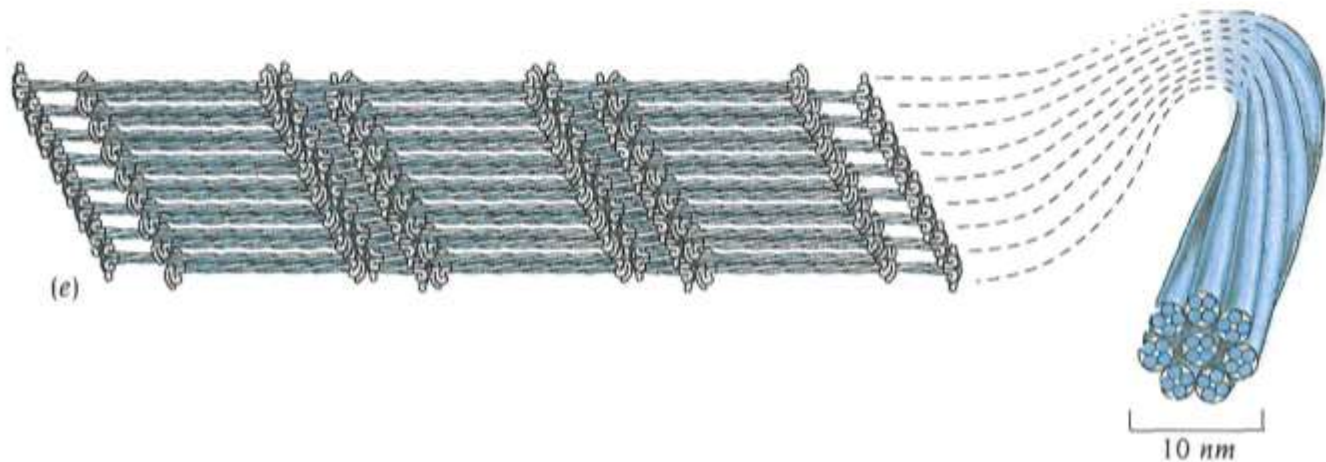
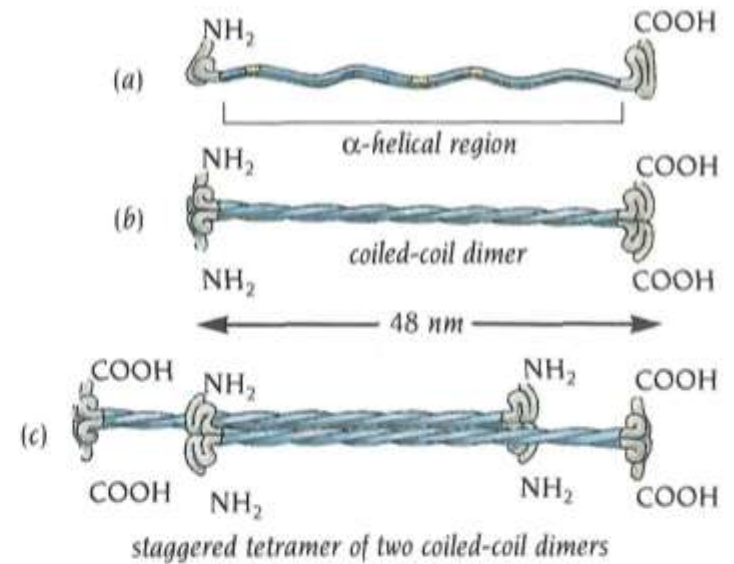


# Fibrilarni proteini – intermediarni filamenti

## Mehanizem sestavljanja intermediarnih filamentov.

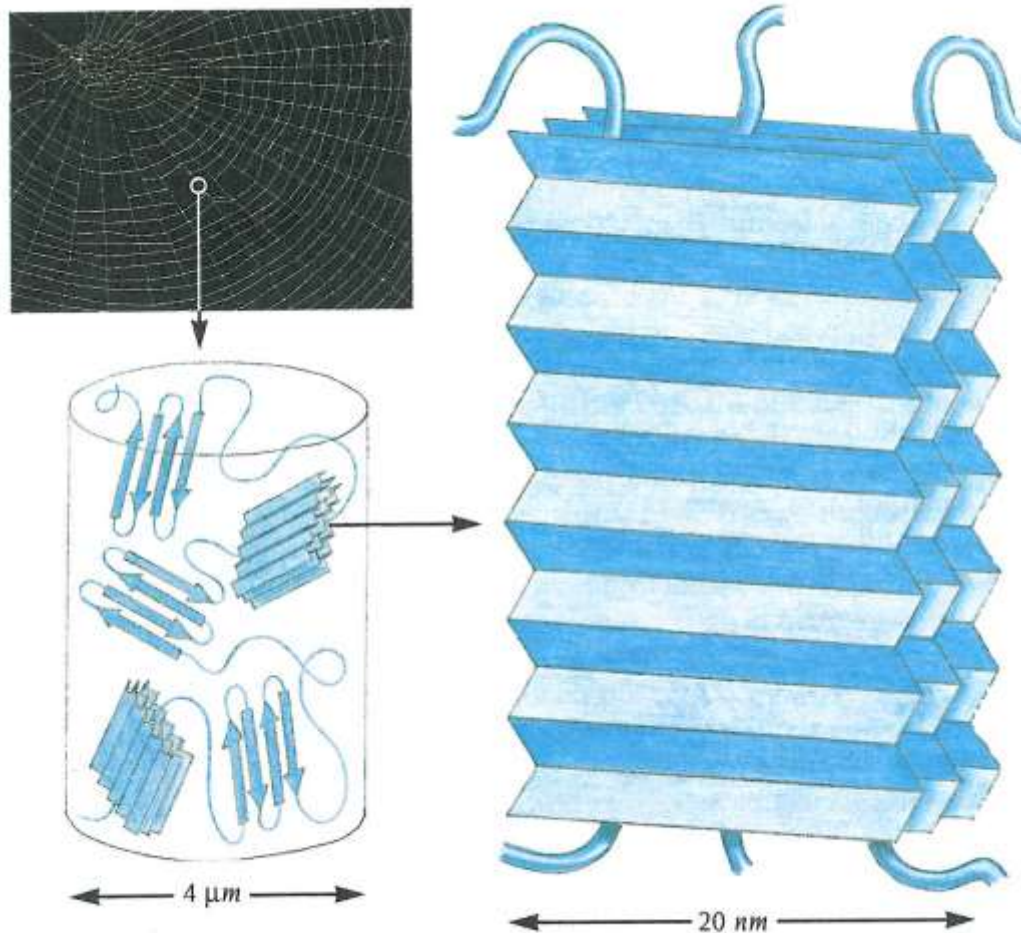


ovita vijačnica



# Fibrilarni proteini - fibroin

**Fibroin** je poglavitna sestavina svilenih vlaken. Soroden protein je **spidroin**, ki sestavlja mreže pajkov. Zgrajena sta iz osrednjega dela (do 800 ostankov), ki je bogat s poli-A ponovitvami ter ponovitvami Gly-Ala/Ser, vmesnih hidrofилnih segmentov, ter N- in C-končnih variabilnih domen.



# Fibrilarni proteini - fibroin

Gly-Ala ponovitve tvorijo  $\beta$  ploskve, ki se nalagajo ena na drugo.

Znane so strukture nekaterih N- in C-končnih domen, ni pa znana še struktura osrednjega dela.

