



## Chapter 6.1-6.2

1 message

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Tue, Sep 6, 2016 at 11:46 AM

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Here's what we got from you:

## Chapter 6.1-6.2

### What is meant by secondary structure?

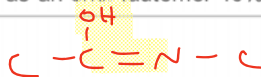
Interactions in the polypeptide backbone to form common themes in protein folding - primarily alpha helices and beta sheets. Also, beta hairpin turns and other types of helices. Random coil IS a secondary structure!

### What is meant by tertiary structure?

the interaction between secondary structural units to form a 3d structure

### Why is the peptide bond planar and rigid?

because the peptide bond exists as an enol tautomer 40% of the time



The \_\_\_\_\_ conformation of the peptide bond is most stable.

- cis
- trans
- they are equally stable in most cases

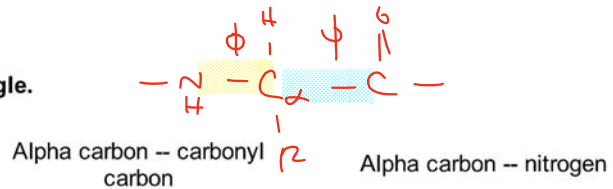
Which amino acid has the highest percentage of peptide bonds in the cis conformation?

proline (~10%)

**Why was Linus Pauling so amazing?**

He won two Nobel prizes. One was based on his work with proteins to make predictions about the secondary structure - this happened a decade before the structures were solved.

**Match the bond with the torsion angle.**



Phi	<input type="radio"/>	<input checked="" type="radio"/>
Psi	<input checked="" type="radio"/>	<input type="radio"/>

**An alpha helix has a pitch of \_\_\_\_\_ angstroms.**

- 5.4
  - 3.6
  - 3
  - 12
  - 18
- Handwritten notes:*  
A bracket above 5.4 is labeled "rise per turn".  
An arrow points from 3.6 to the text "# of amino acids per turn".

**Where do alpha helices appear on a Ramachandran Diagram?**

lower left quadrant - centered around -90, -60

**What value are the values of phi and psi when a peptide is fully extended?**

-180, 180

**Secondary structure stability relies on hydrogen bonds between atoms of the \_\_\_\_\_.**

- backbone
- side chains
- both

*Handwritten note:* for tertiary structure only!

Which type of beta sheet has stronger H-bonds?

- parallel
- antiparallel

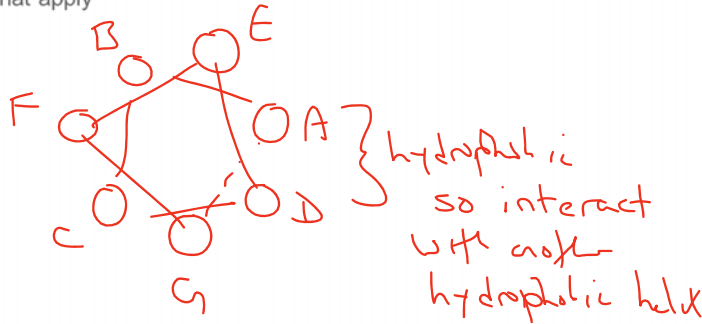
Why do parallel beta sheets require an out of plane "loop" between adjacent strands while antiparallel sheets do not.

To get the strands to line up in a parallel manner, the N-termini need to be on the same side of the motif - this requires a wrapping of sorts to get the proper orientation

Coiled-coils have a seven amino acid repeating pattern. Typically, hydrophobic amino acids are found at what position(s)?

Choose all that apply

- a
- b
- c
- d
- e
- f
- g



Collagen is a protein with a three amino acid repeating pattern: Gly X Y. Proline is commonly found at the X position and a modified version of Proline populates the Y position. What is this modification?

the proline sidechain gets oxidized to a hydroxy-proline

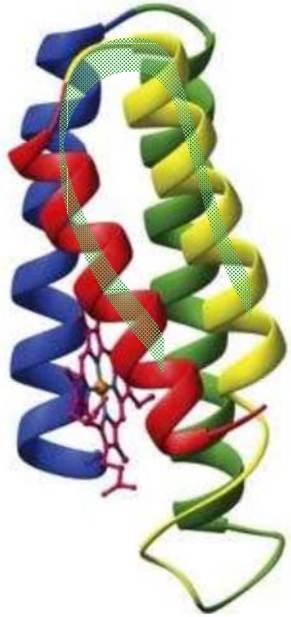
What vitamin is required in the maintenance of collagen? Why?

Vitamin C. It plays a role in the oxidation of proline

What is the most common structural motif found in proteins?

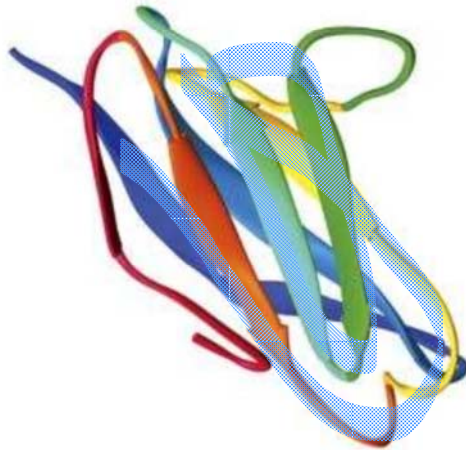
beta-alpha-beta motif

Which common structural motifs are present? Select all that apply.



- beta-alpha-beta motif
- beta hairpin
- alpha-alpha - also called helix-turn-helix
- greek key
- Other:

Which common structural motifs are present? Select all that apply.



- beta-alpha-beta
- beta haripin
- alpha-alpha
- greek key

Other:

**What two techniques can be used to determine the structure of proteins?**

**It is common for proteins to have similar structures if they have different amino acid sequences.**

- True
- False

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