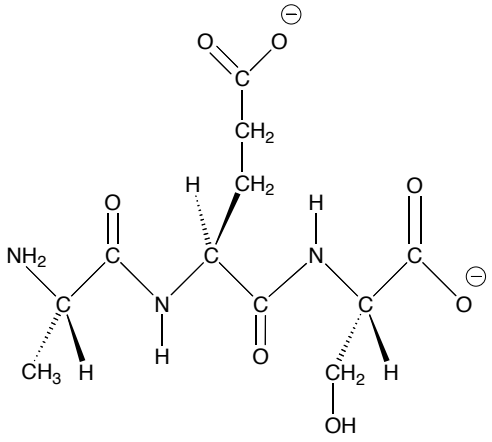
Name _____

Chem 352 - Spring 2009
Quiz 2

1. For the tripeptide shown to the right:



   a. *Circle* the α-carbon atoms.

   b. *Label* the bonds in the backbone as φ, ψ, or ω.

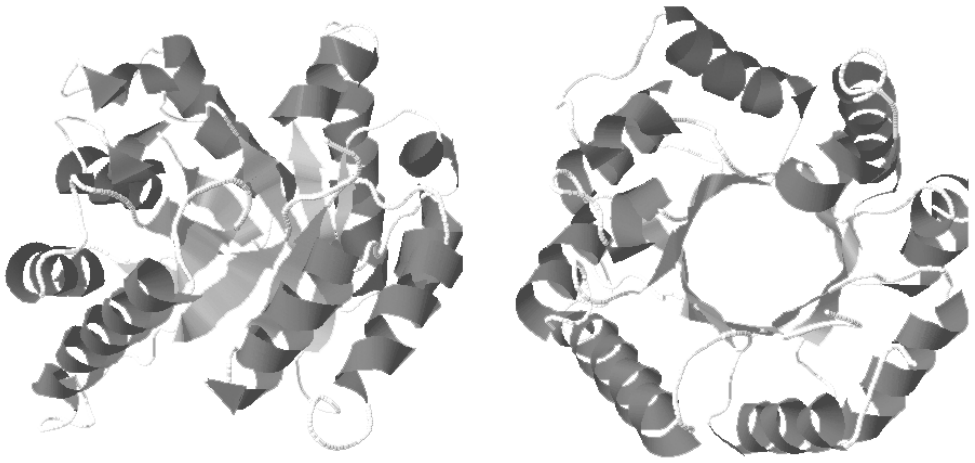
   c. Why is rotation about the ω bonds more restricted than that about the φ and ψ bonds?

   d. What restricts completely free rotation about the φ and ψ bonds?

   e. Using three-letter codes, what is the amino acid sequence of this tripeptide?_____

   f. Is the structure shown that for the tripeptide at *low pH*, *high pH*, or *neutral pH*? Explain.

2. The structure for domain 2 of pyruvate kinase is shown below in two different orientations.



   a. Which type of domain fold does it exhibit, all α, all β, α/β, or α + β?_____

   b. Is the β-sheet in this domain parallel or antiparallel? _____

   c. What supersecondary motif does this structure contain?_____

3. Mountain climbers who are interested in reaching the summit of Mt Everest must do so in stages; spending extended periods of time at camps located at increasingly higher elevations along the trek. This helps to increase the oxygen carrying capacity of their blood by inducing the accumulation of the metabolite 2,3-bisphosphoglycerate in their blood. Explain how this accumulation leads to an increased oxygen carrying capacity. (Please use complete sentences to answer this question.)

4. Explain how the formation α-helical and β-sheet secondary structures help a protein's polypeptide to fold into its native tertiary structure. Include in this discussion a description of the non-covalent interactions that stabilize both the secondary and tertiary structures. (Please use complete sentences to answer this question.)