Name: \_

Exam #1

**This exam is to be worked on independently**. You must not talk, or otherwise communicate, with *anyone* other than Professor Martin about *any* aspect of the exam. You may not communicate with your fellow students in the class, nor with any other colleagues, faculty or student.

## Due in Craig Martin's office (LRGT 403D, October 16, 9:00am

Honesty and integrity are absolute essentials for this class. In fairness to others, dishonest behavior will be dealt with to the full extent of University regulations.

- 1. For the first question, examine structure 2drv from the PDB (a <u>Jmol presentation</u> is available for your benefit on our course WEB page) and answer the following questions:
- a) Examine the interface between the two subunits. Describe the chemical nature of this interface and what forces you think drive and/or are important in subunit-subunit interactions.

- b) Looking at the location of amino acids 83 to 92, do you expect this stretch to be polar, nonpolar, or amphipathic? Is your prediction upheld? Explain your prediction.
- c) Looking at the location of amino acids 98 to 104, do you expect this stretch to be polar, nonpolar, or amphipathic? Is your prediction upheld? Explain your prediction.
- d) Briefly describe the subunit and domain structure of this protein. Justify your explanation.
- e) This structure contains heteroatoms. Draw the chemical (structural) formula for the heteroatom MSE in this structure, using classic organic structure notation. Attach a separate sheet with your drawing of the structure.

- 2. For the second question, examine structure 2r13 from the PDB (a <u>Imol presentation</u> is available for your benefit on our course WEB page) and answer the following questions:
- a) In the JMol presentation at our WEB site, toggle between the two surface views. Explain what you think is the difference between the two views (something more deep than "one is smoother than the other"). Explain why one view is "better" than the other.

b) Given your understanding of protein structure, explain *why* this molecule is unlikely to adopt this precise structure as a monomer in solution.

- 3. For the third question, examine structure 2OZB from the PDB (a <u>Jmol presentation</u> is available for your benefit on our course WEB page) and answer the following questions:
- a) Explain the role and interactions within this structure of Glu 41 of chain D.

b) Explain the role and interactions within this structure of His 270 of chain E.