

Summer 1998, Dr. Hunter

Chemistry 785: Biochemistry I: Second Mid-Term Exam

Name: _____

last name

first name

Student Number (your social security number): _____

Signature: _____

In addition to this cover page, this midterm exam consists of 7 pages of questions for 8 pages in total. Please make sure you place your name (last name first) and your student number in the spaces above and sign on the line. *Initial each page in the top right hand corner* (i.e. near the page number) in case your exam pages get separated.

To obtain maximum credit for each question, show your work/thinking in detail. Partial credit for questions will not be assigned if no work is shown. Feel free to use short text explanations to explain your drawings if your pictures are ambiguous. If you have to make guesses, assumptions, etc., write me a short note with your reasoning so I can follow your thinking and assign part marks.

You may use molecular models to help you answer questions. You may also bring in a single 3x5" index card with writing on two sides. Staple this to the exam when you hand the exam in. Feel free to ask me questions.

This midterm is worth 100 points out of the 400 for this quarter.

/100

[25 points maximum for each] Answer *four out of seven* of the following questions. Clearly indicate which ones you want me to grade.

- a. Clearly explain how BPG changes the O₂ affinity of Myoglobin and Hemoglobin and the biochemical means by which any changes occur.

b. What is a Lineweaver/Burk plot and how is it used to give information about the kinetics of a reaction? How would the addition of different inhibitors effect the Lineweaver/Burk plot?

c. Explain what a transition state analogue is and give one examples. If one raised an antibody to a transition state analogue, how would this antibody be expected to effect the rate of the chemical reaction modeled by the transition state analogue?

d. Draw the O₂ saturation curves for Myoglobin and Hemoglobin in your body and explain the differences in the shapes of these curves and the biochemical origin of these differences.

e. Clearly explain how the H^+ and CO_2 concentration in the blood effects the O_2 saturation curves of Myoglobin and Hemoglobin. Describe the biochemical mechanisms for any effects.

f. Using the structure of Lysozyme and the mechanism by which it cleaves glycosidic linkages in NAG₆, explain why this reaction has the observed pH dependence.

g. Using the structure of Aspartate Transcarbamoylase and the mechanism of the reaction it catalyzes, clearly explain how CTP and ATP regulate the rate of this reaction.