

Summer 1998, Dr. Hunter

Chemistry 785: Biochemistry I: Final 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 one half of the points 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. For the following peptide, draw its **Lewis** structures at the indicated pH values and calculate the net charge on the peptide. Also, predict its isoelectric point and draw its structure at this pH.

Pro-Ala-Phe-Arg-Asp pH = 10.0

Terminal carboxyl	3.1
Asp or Glu	4.4
His	6.5
Terminal amino	8.0
Cys	8.5
Tyr or Lys	10.0
Arg	12.0

b. Draw the structure of the portion of a single stranded DNA molecule encoded by the sequence CCA.

- c. Clearly explain the structure and functions of Collagen.

- d. Draw the structure of one member from each of three classes of lipids.

e. Clearly describe the factors discussed by Dr. Day that are critical for engineering protein stability in industrial enzymes.

f. Clearly describe the process by which one carries out a two dimensional gel electrophoresis experiment and why one would do so.

g. Clearly explain the three main functions of RNA in your cells and relate these to their molecular structures.