

Biochemistry Cumulative Exam

November 3, 2011; Topic: Chemical Biology

by Prof. Larry Miller

- 1) 30 pts.** Name the three main cellular functions that are targeted by antibacterial therapeutics. Give an example of a specific antibiotic or class of antibiotics that targets each function. Provide a representative structure for two (2) of these types/classes of antibiotics. Note, structures have to only be *approximately* correct.
- 2) 10 pts.** Both novobiocin and coumermycin inhibit *E. coli* DNA gyrase. Describe the function(s) of this enzyme based on studies that utilized these antibiotics as chemical probes.
- 3) 10 pts.** What is the difference between a gene-gene interaction and a protein-protein interaction?
- 4) 25 pts.** Choose one (1) of the following examples from the review article, and describe how antibiotics were used to study the biological process in question:

 - i) SOS response
 - ii) Ribosomal peptide synthesis
 - iii) Protein translocation
- 5) 25 pts.** It has proven to be very difficult to identify new classes of antibiotics (i.e., new functional targets). Speculate as to why this might be the case, and be sure to use information that was given in the review to support your answer.