

Problem Set 7 Due Oct 21

1. True/False short answer. This is one kind of problem I give on exams. Answer True or False, and provide one or two sentences that says something relevant about the question. Your statement must be relevant to get credit for the True/False response. For some of them you do have to think carefully about how to say something tersely, and some responses should be very easy.

A. Mendel would have discovered the same principles of genetic recombination if he had been studying bacterial genetics.

*False. Bacteria do not have reciprocal genetic exchange. Bacteria are haploid so segregation of two alleles at one locus can't be determined. Bacteria don't do mitosis. Any of these is good.*

B. Transduction requires a single crossover to introduce a donor gene into the recipient chromosome.

*False. It requires two crossovers, because one crossover of a linear by circle gives a linear which is dead in bacteria.*

C. Gene transfer from a donor to recipient in an Hfr x F- cross requires that the Hfr be recA+.

*False. recombination does not occur in the donor, only the recipient; recA required in the recipient.*

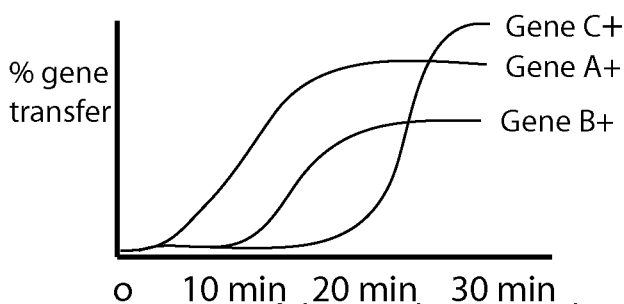
D. Cyclin E overexpression might cause cancer in a way that is similar to Cyclin D overexpression.

*True. cyclinD-CDK causes inhibition of Rb (see pathway), so overexpression of cyclin D would be expected to cause greater levels of inhibition of Rb. Similarly, cyclinE inhibits Rb, so its overexpression might cause the same effect as overexpression of cyclin D.*

E. In complementation test most of the phage produced must be wildtype.

*False: in a mutant by mutant test of complementation (I forgot to say mutant by mutant) most progeny would be mutant because both genomes can be duplicated if they are complementing each other.*

F. In the experiment shown below, the order of genes is not interpretable from the data shown. The cross was Hfr A+ B+ C+ x F- a- b- c- (read part G if something confuses you).



*False, gene order is interpretable from the time of gene transfer on X axis...Is A, B and C in that order.*

G. One aspect of the results in F makes absolutely no sense.

*True--that GeneC+ has a higher level of transfer than A+ or B+ is nonsensical...since it is further from the site of transfer, it should achieve an overall lower level of transfer.*