Bi1x, Spring 2010

Growth Curves Analysis
Due 5/10/10, in class at 7 PM Not in notebooks, paper copy

Turn in a lab report of the experiment and answers to the questions below. You should include an introduction to bacterial growth and antibiotics, an explanation of the procedure you used, results, your conclusions and discussion, as well as any sources you cited. Also, remember that every figure and plot needs to have its own caption such that you could independently understand it without having to refer to the text.

The procedure should explain each step in the protocol, including ones that the TAs did for you in the setup. Write this as a report: use full sentences and walk the reader through each step. Do not write a list. In this case, your lab notebook is a reference for you to look up exactly what you did in the procedure.

In your results, include a graph of all the curves in the supplied data, since the cells were slow to grow on Tuesday. Label the lag phase, exponential phase and any other points of interest. What do you expect to see in such a plot? Is there anything strange about your plots? Can you calculate a doubling time(s)?

To find the relationship between OD and number of cells, use the provided data, from the LB + 0μg/mL kanamycin. Knowing that the student plated 100 microliters on each plate, and the dilution factors, you should be able to find the number of cells per mL at both ODs. Plot these points and fit a line showing the OD-to-cell conversion factor. Is it close to the expected value? (OD_{600} 0.1=10^8 cells/mL) Discuss your error. Where might large errors have come from?

Discuss the conclusions you can draw about challenges to *E. coli* with antibiotics and why kanamycin might differ from other antibiotics, like penicillin or vancomycin. How do these work? Can you estimate the MIC (minimum inhibitory concentration)? What is the clinical significance of the MIC and what can doses of antibiotic below that level lead to in the long run? Can you find an example of this?