

Chem 4842K Laboratory

Instructor : Dr. Holly Carpenter

Office: Rogers Rm. 318

Office Hours: MWF 10:00-11:00 AM, TR 11:10 AM -12:40 PM, or by appointment

E-mail: hecarpenter@ngcsu.edu

Purpose: The lab exercises and cases listed below will reinforce and supplement the material you learn in class. The labs you will be doing are meant to familiarize you with common and useful techniques used in an advanced biochemistry, biotechnology, or chemical biology research laboratory.

Attendance: Attendance is mandatory and will be recorded. All work must be completed during the specified lab period(s) unless otherwise advised. Students will not be allowed to make-up labs without documentation of an acceptable reason for missing the lab. Please obtain a note from the doctor or admissions nurse.

Grading : The labs, being of variable difficulty, are worth the following points:

<u>Assignment</u>	<u>Point value</u>	<u>Due Date</u>
Project 1		4-9-09
Part 1:	150 pts	
Experiment 1: Planning/Primer Design		
Experiment 2: PCR Amplification and purification		
Experiment 3: Plasmid/Gene Digest, Gel Electrophoresis		
Experiment 4: DNA gel purification/ligation		
Experiment 5: DNA transformation		
Experiment 6: DNA Miniprep and sequencing		
Part 2:	100 pts	
Experiment 1: Protein Expression		
Experiment 2: Protein Purification		
Experiment 3: Characterization studies (SDS-PAGE, Fluorimetry)		
Total	= 250 points	

One grade is reported for both the lecture and lab. The lab counts as ~1/4 of your total grade.

Lab Notebooks:

You will also be required to turn in your lab notebook with your lab reports for grading. **A portion of each lab report grade will be determined by the quality of your lab notebook.** I expect that you know how to keep a detailed, accurate, and organized notebook. I will also check notebooks periodically.

Your lab notebook should contain a description of what you did in enough depth that it could be reproduced.

Your lab notebook should contain all of the data you collect.

Your lab notebook should be dated and written in pen.

Lab Reports:

The lab portion of the course is organized into one major project area with 2 parts. Each part will require several lab exercises. Be prepared to complete the exercises as required. This may mean that you will have to come into lab during times which are outside of the normal Thursday lab time. The major project will require a formal lab report. You will be graded on the quality of your data, the quality of your writing, the answers to posed questions, and the completeness of your notebook. Lab reports should be typed. Lab reports will be due 1 week from the date the project is completed. Your lab reports should include the following sections

Title Pretty self explanatory, be concise but descriptive. Also include your name (obviously) as well as the name of your lab partner (if you have one).

Introduction This should explain the major concepts that you are going to learn from the lab. There are usually 3 or 4 things that I expect you to learn about in each lab, figure out what those things are and write about them. This should be about a page or two for the longer labs, don't write a novel.

Procedure Your procedure should tell me what *you* did and should be complete enough that another student could use it to repeat your work. I should be able to send your procedure to a student in Alaska and he or she should be able to perform the experiment. You should include things such as compositions of solutions and buffers, volumes and amounts of reagents, wavelengths, etc. Your procedure should be written in paragraph form and in past tense third person.

Here's an example of past tense third person....

"Aspirin (250 mg) was dissolved in water (100 ml)." Notice that all of this happened already (past tense) and that there aren't any people involved, *you* are not the subject (third person).

Data and Results This is where your raw data, as well as graphs and calculated data, should be placed. If there are any complex calculations give me an example of how you did them. Tables are helpful.

Discussion Discuss what you learned. This section is often a continuation of the introduction hitting those main points again with respect to the work you did. Include

your conclusions, descriptions of how error may have occurred, and what you would do differently if you did it again.

Miscellaneous Lab Information:

1. **Close-toed shoes must be worn in the lab.** Students will not be allowed to work in the lab while wearing sandals, shorts etc., and NO extra time will be allowed for students who must leave to change clothes.
2. **Always wear safety glasses or goggles** in the lab.
3. You must keep a notebook. It should be a bound notebook and it should be kept in pen. Pages should be dated.
4. Messes will not be tolerated. Clean up after yourself. If students begin leaving chemicals and glassware out, I will deduct points from labs.
5. You may work on labs with a partner. You may work with *one* partner, unless directed otherwise.
6. For all labs, lab partners may turn in joint lab reports with the understanding that both partners will receive the same grade.