

BI/CH 368L
Biochemistry Laboratory Syllabus – Spring 2012

Instructor:

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General Information:

- This is an integrated laboratory, where students from BI 368 and CH 368 come together to learn in a collaborative environment. We will employ a case study approach, applying biochemistry tools to real-world problems.
- Experiments are available via the BICH 368 laboratory homepage: <http://www.colby.edu/chemistry/BC368/laboratory/lab.html>
- Experiments require advanced preparation and organization so that you are prepared to begin work immediately. It is not acceptable to spend the first 15 minutes of lab time reading the handout, as many exercises will take the full four hours. If you are unprepared, you may be asked to leave lab.
- Each laboratory section is scheduled for four hours, but you will occasionally be asked to return to lab outside of the normally scheduled time. Each experiment requires a formal write-up, which will comprise a significant part of your grade.

Anticipated Schedule:

<u>Date</u>	<u>Assignment Due?</u>	<u>Experiment</u>
2/7 & 2/8; 2/14 & 2/15; 2/21 & 2/22		1. Gift Horse? Verification of Equine Maternity via PCR-RFLP Analysis
2/28 & 2/29; 3/6 & 3/7; 3/13 & 3/14	Paper #1 sections Peer Review Final Paper #1 due in lab	2. Heart Attack? Analysis of Isozymes in Blood Samples from ER Patients
3/20 & 3/21	Poster topic due	Spring Break ...no lab!
3/27 & 3/28	Paper #2 sections	3. Death on the Farm! Inhibition of Citric Acid Cycle Enzymes
4/3 & 4/4	Final Paper #2 due	5A. Poster Preparation and Checkpoint
4/10 & 4/11; 4/17 & 4/18	Paper #3 due in lab	4. A Better Herbicide? An investigation in Rational Molecular Design
4/24 & 4/25		5B. Poster Preparation
5/1 & 5/2	Poster due by 1:00	5C. Poster Sessions
5/4	Paper #4 and notebook due at noon	

Laboratory Requirements:

In BICH 368L, we are emphasizing formal reports and peer collaboration with writing. This gives you practice with the type of scientific writing that you will do most often after Colby. Grading is as follows:

1. Your laboratory **notebook** is the primary record of your data collection. It is also where you record your pre-lab preparation. Your instructor will sign your notebook each week when you arrive and leave lab and then check your notebook at the end of the semester. Your laboratory notebook will comprise 5% of your grade.
2. You will write **4 different papers**; with due dates outlined above and below. These papers will comprise 70% of your lab grade. See below for the format of the papers.
3. A **poster session** will be conducted during the last week of lab. You will work in pairs to prepare a poster on a metabolic disorder of your choice and display your project at a designated spot in the science complex. This will comprise 20% of your grade. See "Poster Session Guidelines" on the BICH 368L homepage for more details.
4. The remaining 5% of your lab grade will come from **how well you perform in lab**. Do you make your partner do all the work? Do you work efficiently? Do you come to lab on time and prepared? Do you have a positive attitude? These are all factors. Attendance is mandatory. There are no make-up labs. Unexcused absences in laboratory will be greeted with an F in the course.

The Laboratory Notebook:

Use a bound notebook. Do not skip or remove any pages. Details for keeping a laboratory notebook are below:

- a) Use only ink for recording notes. Do not white out or erase any mistakes. You may cross out any erroneous entries, but they must remain legible. Explain any such errors. Use tape, not staples, for any images you include. Avoid "fold-out" inserts.
- b) Provide a Table of Contents for your notebook at the beginning. Each experiment should start with the title, date, and your lab partner.
- c) Your pre-lab preparation each week includes the following:
 - Sketch a flowchart of the procedure in your notebook. Do not simply cut and paste the lab handouts into your notebook- the flowchart is intended to make sure you are familiar with the sequence of events before coming to lab. Refer to the lab handout itself during the course of the experiment for experimental details.
 - **Perform any required calculations.**
- d) **Record all your raw data** (including gel images) and observations in your notebook during the lab period (don't trust your memory!). Include any modifications of the written procedure that arise during the laboratory period itself and any other pertinent information (sample number, etc.) Record all data directly into the notebook, never on loose paper or into Excel. Label all data clearly, including relevant units. Write what is done- not what should have been done.
- e) Keep your notebook as neat as possible under laboratory conditions. We understand that your notes may be subject to water blots, crossed-out mistakes, acid stains, and the like. Since only the original, unedited notes have significance, these risks must be expected. Make your notebook an honest record of your experiments.
- f) After you have completed your lab work each week, both you and your instructor must sign and date your notebook. Your instructor will only sign a complete notebook (pre-lab work completed and raw data recorded).
- g) After the experiment is over, write the report as described below.

The Laboratory Papers:

You will write four formal papers. Due dates and times are given in the schedule above. Late assignments will be penalized 10% per day or fraction thereof. Assignments more than 5 days late will not be accepted.

General guidelines for all papers: Manuscripts must be professional in all aspects, including text, tables, and figures. Writing must be concise yet complete. Careful thought, research, and editing will be required. Furthermore, use of the **primary literature** is crucial to set the context of your work- note that the primary literature is that contained within scientific journals; Web sites do not count unless they are electronic versions of peer-reviewed publications. For each distinct type of paper, you should read some examples to get a feel for the level of detail to include, as well as the style. Please also ensure that you follow standard scientific report-writing practice by referring to all tables and figures in your narrative and properly referencing your claims. Papers that do not follow the proper format will be returned unreviewed, accumulating late penalties until they are resubmitted in the proper format. Keep in mind that reference formats and in-text citation styles are typically highly variable across different journals. Specific details about each assignment follow.

Paper #1. First draft due in lab on Feb 28th or 29th; final version due in lab on Mar 13th or 14th. This paper, based on your results from Experiment 1 (Gift Horse?), will be prepared as a Case Report for the Journal of Forensic Sciences (JFS). You can find “JFS Author Guidelines” linked on the BICH 368L homepage. Follow all instructions, except that your paper should be a maximum of 2 pages long (including figures and tables) and you do not need a cover letter. You and your partner will work collaboratively over the course of a few weeks to produce a single paper. One week after completing the experiment, partner A will turn in two copies of an Introduction (with case description) and a Methods section, and partner B will turn in two copies of a combined Results/Discussion section. Each partner will have one week to complete a peer review of their partner’s work, which will be turned in both to the instructor and the partner in lab. Your instructor will provide a rubric to guide you through your review, and you will also make careful and thoughtful editorial comments on the manuscript itself. During the third week, each partner will revise their own sections, and the two partners will produce a single, cohesive document *with an abstract*. This final paper is due in lab on March 13th or 14th. Note that you will be graded on all three documents: the first draft (5% of lab grade), the peer review (5% of lab grade), and the final paper (10% of lab grade).

Paper #2. First draft due in lab on March 27th or 28th; final version due in lab on Apr 3rd or 4th. Again, this paper will be written with your partner, although there is no formal requirement for a peer review (but it’s an excellent idea to do this on your own). This paper, based on your results from Experiment 2 (Heart Attack?), will be prepared as a Grand Rounds article for the Journal of the American Medical Association (JAMA). You can find “JAMA Instructions for Authors” linked on the BICH 368L homepage. When you get to the JAMA – Instructions for Authors page, click on “Grand Rounds” under the heading “Articles Requiring a Presubmission Inquiry.” Assume that you or your boss has made the presubmission inquiry and you have been approved to write the paper. Your paper must include an introduction, like the model Grand Rounds paper linked on the webpage (even though not all Grand Rounds papers do have introductions). Follow all instructions for authors, except that your paper should be a maximum of 2 pages long and you do not need a cover letter. One week after completing the experiment, partner A will turn in the Introduction and Case Presentation sections, and partner B will turn in a combined Results/Discussion section. During the next week, the partners will work together to produce a single, cohesive document *with an abstract*. This final paper is due in lab on April 3rd or 4th. Note that you will be graded on both documents: the first draft (5% of lab grade) and the final paper (15% of lab grade).

Paper #3. Due in lab on April 10th or 11th. This paper, a solo effort based on your results from Experiment 3 (Death on the Farm!), will be prepared as a communication for the Journal of the American Chemical Society (JACS). This means that there is a two-page text limit (including figures or tables, and references). You can find "JACS Author Information" linked on the BICH 368L homepage. It is not necessary to use the Communication Template, nor must you provide a TOC graphic, but you must use the proper format for the paper, and you must include an abstract.

Paper #4. Due at high noon on the last day of classes. This paper, again a solo effort, will be based on your results from Experiment 4 (A Better Herbicide?). This paper should also be prepared as a JACS Communication, similarly to Paper #3.

Intellectual Responsibility:

Except for assignments designated as collaborative, any work submitted in your name is to be your work alone, including finding primary literature for your papers. However, each student may of course exchange experimental details and data with her/his lab partner and classmates. Data not your own should be clearly referenced. Any violation will result in an F in the course.