



DEPARTMENT OF BIOCHEMISTRY

**BCHM 30900 – Biochemistry Lab Syllabus  
Summer 2017**

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**Lab TAs:**

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**COURSE OBJECTIVES**

Students who enroll in BCHM 30900 have wide-ranging interests and aspire to pursue careers in biological science, medicine, nursing, veterinary medicine, animal science, dietetics, food science, botany and nutrition. This course will provide students with the basic foundation of biochemistry concepts that will be required for the pursuit of their academic and career objectives.

**LEARNING OUTCOMES**

Upon completion of BCHM 30900, students with a passing or above grade will be able to:

- Discuss how the structure of biomolecules, such as proteins, nucleic acids, lipids and carbohydrates, determines their overall biological function in addition to their behavior in experimental settings.
- Demonstrate proficiency in the following lab skills:
  - Liquid handling and dilutions
  - Protein purification and determination assays
  - Column chromatography
  - Spectrophotometric assays
  - Enzyme activity assays
  - Lab calculations and data handling
- Understand and apply scientific methods of experimental design and analysis.
- Apply quantitative reasoning in data analysis and reporting.
- Communicate scientific ideas clearly, both orally and in writing.
- Collaborate with peers from diverse programmatic and cultural backgrounds to enhance their learning experience.

**TEXTBOOK: Optional**

Experiments in Biochemistry A Hands-On Approach, Second Edition. Shawn O. Farrell and Lynn E. Taylor. **The course textbook is on reserve in the Life Sciences library.**

**LAB TIME AND PLACE**

Tuesday and Thursdays, 9:50am – 12:40pm

Labs will be held in BCHM 107

## BLACKBOARD

The syllabus for the course will be available via the Purdue University Blackboard Learn site at <https://mycourses.purdue.edu/>

## ASSESSMENT

### Lab Examinations

There will be two exams in this course; a mid-term exam and a final exam at the end of the semester. The lab exams will include both written and practicum sections, and cover how to properly use lab equipment, calculations, and techniques that you have learned during the semester. **The final exam will cover material from the entire course.**

### Participation

You are expected to work with your lab partners to complete a lab. Allowing your lab partners to do all the work for you will result in a 0 for the lab. If you do not clean up your workstation before you leave, all members of your group will be penalized 10% of the points for that lab.

### Quiz

There will be a quiz before every lab, unless specifically indicated by Dr. Hart, to ensure that you are prepared for class. It will cover only very basic material from the powerpoint slides, and/or material which is considered pre-requisite for BCHM 309. Each quiz will be worth 7 of the total 50 lab points. If you are more than 5 minutes late to class you will not be allowed to take the quiz.

### Lab Report

At the end of most labs you will have a written lab report which will be due at the beginning of the following lab period, and should include an introduction, hypothesis, all data and results (including all questions/calculations required according to textbook), and a discussion your findings. There may also be additional questions assigned to help you practice the types of calculations you will see on an exam. Lab reports are worth a total 50% of your grade; please use the rubric and grading keys at the end of this syllabus as a guide when completing your lab report. Lab reports should be submitted to your TA via email before the beginning of the lab session in which they are due. Late submission of lab reports will result in a 10% grade penalty per day that the report is late.

### Determination of Final Grade

Component 1: Lab reports and quizzes 50% (500 points)

Component 2: Midterm 25% (Practicum: 50 points; Written: 200 points)

Final 25% (Practicum: 50 points; Written: 200 points)

The scale for the semester grade

Points	Percentage	Grade
900-1000	90.0-100%	A
800-899	80.0-89.9%	B
700-799	70.0-79.9%	C
600-699	60.0-69.9%	D
0-599	0-59%	F

Missing an exam will result in a grade of 0 being recorded unless documented justification for the absence is presented. Any request to be excused from a quiz or exam must include official documentation (doctor's note, request from academic advisor, etc.) explaining why the exam was or will be missed. Makeup tests will be scheduled in consultation with the instructor if appropriate.

If you have any queries with the way any of your labs or exams have been graded, please take them up first with your TA, then with the instructor.

Requests for re-grades must be submitted no later than the end of the second class period after the graded test or assignment has been returned.

### **CELL PHONES**

Do not use your cell phones in lab. If you are caught using your phone in lab you will receive a zero for the lab.

### **LAB SAFETY & PPE**

Detailed information can be found in Appendix IV of this syllabus. The dress code for lab activities will follow OSHA guidelines, and is for the safety of all students. **A lab coat is required for all lab activities. Please bring one to class.** Closed-toe shoes are required at all times in the lab, and the hemlines of shorts, skirts and dresses must be no higher than knee-length. If you do not wish to wear the safety goggles provided in the lab, you must bring your own. Failure to adhere to the dress code will result in a grade penalty for the first occurrence, and you may be asked to leave the lab for further occurrences.

### **ATTENDANCE**

Attendance of each assigned laboratory period is mandatory. Students that do not attend will receive a zero for that laboratory exercise. Students that miss one class will not be eligible for a grade higher than a C. Students that miss two classes will receive an F. There will be no opportunity for make-up labs.

You will not be allowed to leave the lab before the end of the lab period until you have confirmed with Dr. Hart that your lab partners and you have all completed the day's objectives, and clarified what assignment is due for the following class period.

### **EXTRA CREDIT**

There will be no opportunity for extra credit.

### **OBTAINING EXTRA HELP**

Your TA will be available to answer your questions immediately before or after class, or at office hours. Attendance of office hours hosted by any of the TAs is strongly encouraged. Alternatively, you can submit questions by e-mail that can be answered in class or by return e-mail.

### **ACADEMIC MISCONDUCT**

Academic misconduct of any kind will not be tolerated in any course offered by the Department of Biochemistry. Information on Purdue's policies with regard to academic misconduct can be found at [http://www.purdue.edu/studentregulations/student\\_conduct/regulations.html](http://www.purdue.edu/studentregulations/student_conduct/regulations.html)

Any incidence of academic dishonesty will be reported to the Office of the Dean of Students. Academic dishonesty may result in disciplinary sanctions including expulsion, suspension,

probated suspension, disciplinary probation, and/or educational sanctions. In addition, such dishonesty will result in punitive grading such as:

- receiving a lower or failing grade on the assignment, or
- assessing a lower or failing grade for the course

Punitive grading decisions will be made after consultation with the Office of the Dean of Students. Please note reported incidences of academic dishonesty go on record for reference by other instructors. Further, a record of academic dishonesty is likely to influence how current/future situations are handled.

To provide you with an unambiguous definition of academic misconduct, the following text has been excerpted from "Academic Integrity: A Guide for Students", written by Stephen Akers, Ph.D., Executive Associate Dean of Students (1995, Revised 1999, 2003), and published by the Office of the Dean of Students in cooperation with Purdue Student Government, Schleman Hall of Student Services, Room 207, 475 Stadium Mall Drive West Lafayette, IN 47907-2050.

"Purdue prohibits "dishonesty in connection with any University activity. Cheating, plagiarism, or knowingly furnishing false information to the University are examples of dishonesty." [Part 5, Section III-B-2-a, [Student Regulations](#)] Furthermore, the University Senate has stipulated that "the commitment of acts of cheating, lying, and deceit in any of their diverse forms (such as the use of substitutes for taking examinations, the use of illegal cribs, plagiarism, and copying during examinations) is dishonest and must not be tolerated. Moreover, knowingly to aid and abet, directly or indirectly, other parties in committing dishonest acts is in itself dishonest." [University Senate Document 72-18, December 15, 1972]

More specifically, the following are a few examples of academic dishonesty which have been discovered at Purdue University.

- substituting on an exam for another student
- substituting in a course for another student
- paying someone else to write a paper and submitting it as one's own work
- giving or receiving answers by use of signals during an exam
- copying with or without the other person's knowledge during an exam
- doing class assignments for someone else
- plagiarizing published material, class assignments, or lab reports
- turning in a paper that has been purchased from a commercial research firm or obtained from the internet
- padding items of a bibliography
- obtaining an unauthorized copy of a test in advance of its scheduled administration
- using unauthorized notes during an exam
- collaborating with other students on assignments when it is not allowed
- obtaining a test from the exam site, completing and submitting it later
- altering answers on a scored test and submitting it for a regrade
- accessing and altering grade records
- stealing class assignments from other students and submitting them as one's own
- fabricating data
- destroying or stealing the work of other students

Plagiarism is a special kind of academic dishonesty in which one person steals another person's ideas or words and falsely presents them as the plagiarist's own product. This is most likely to occur in the following ways:

- using the exact language of someone else without the use of quotation marks and without giving proper credit to the author

- presenting the sequence of ideas or arranging the material of someone else even though such is expressed in one's own words, without giving appropriate acknowledgment
- submitting a document written by someone else but representing it as one's own"

### **CLASS ATTENDANCE**

In accordance with University policy, you are expected to attend every scheduled class. If you have a valid reason for missing class such as a University-sponsored activity, religious observances, illness, or family emergency, the instructor or TA will assist you in obtaining information and materials you may have missed. Students who skip class without a valid excuse should not expect the instructor or TA to supply class notes or provide special help. For the official university policy, see: [www.purdue.edu/odos/services/classabsence.php](http://www.purdue.edu/odos/services/classabsence.php) and [http://www.purdue.edu/studentregulations/regulations\\_procedures/classes.html](http://www.purdue.edu/studentregulations/regulations_procedures/classes.html)

### **EMERGENCY PREPAREDNESS**

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances. To get information about changes in this course consult the class Blackboard site or e-mail or phone the instructor.

### **ON-LINE COURSE EVALUATIONS**

During the last week of the semester, you will be provided an opportunity to evaluate this course and your instructor(s). To this end, Purdue has transitioned to online course evaluations. On Monday of the eighth week of classes, you will receive an official email from evaluation administrators with a link to the online evaluation site. You will have one week to complete this evaluation. Your participation in this evaluation is an integral part of this course. Your feedback is vital to improving education at Purdue University. I strongly urge you to participate in the evaluation system.

### **NON-DISCRIMINATION POLICY STATEMENT**

Purdue University's non-discrimination policy will be upheld in this classroom. Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life.

Purdue University views, evaluates, and treats all persons in any University related activity or circumstance in which they may be involved, solely as individuals on the basis of their own personal abilities, qualifications, and other relevant characteristics.

## LAB SCHEDULE

Week	Date	Experiment / Topic	Chapter	Written Assignment // Notes
1	Jun 13	Lab introduction: Biochemistry boot camp // Experimental Design introduction. Experiment 1	1	No Pre-Lab Quiz. Mini report (see grading key). Begin Experimental Design Report, which is due before lab on 7/13/17.
	Jun 15	Lab introduction: Acids, bases and buffers Experiment 2	2	Lab report, additional problems as assigned on slides.
2	Jun 20	Lab introduction: Spectrophotometry // Experimental Design introduction. Experiment 3 only, NOT 3a	3	Lab report, additional problems as assigned on slides.
	Jun 22	Lactate Dehydrogenase Purification I: Salt precipitation week 1. Experiment 4a	4	Mini Report: Data table only. Must have ALL appropriate calculations completed.
3	Jun 27	Lactate Dehydrogenase Purification I: Salt precipitation week 2. Experiment 4a	4	Lab report, additional problems as assigned on slides.
	Jun 29	Lactate Dehydrogenase Purification III: Gel Filtration Chromatography. Experiment 7a	5	Lab report, additional problems as assigned on slides.
4	Jul 6	Lactate Dehydrogenase Purification II: Ion Exchange Chromatography. Experiment 5a	7	Lab report, additional problems as assigned on slides.
5	Jul 11	Midterm Practicum exam // Midterm Written Exam		<b>Practicum exam (40 minutes): Protein determination (Bradford) assay. Written exam (60 minutes).</b>
	Jul 13	Experimental Design		No Pre-Lab Quiz. Experimental design report due via Blackboard before this class begins. Should be a detailed experimental protocol as instructed in class. Include a background/introduction, hypothesis, materials & method and expected results.
6	Jul 18	Cellobiase purification I: Salt precipitation	4	Lab report, should mirror format of LDH purification report.
	Jul 20	Cellobiase purification II: Gel Filtration Chromatography	5	Lab report, should mirror format of LDH purification report.
7	Jul 25	Cellobiase purification III: Ion exchange Chromatography	7	BIG Lab report, should mirror format of LDH purification report. Include everything from Cellobiase purification: Intro, protocol, all data and results and comprehensive discussion. Due 7/31/17
	Jul 27	Complete assays // Data analysis //Review	8	Come to this session prepared with your questions!
8	Aug 1	Final Exam practicum		<b>Determine the Fold Purification of an enzyme sample (80 minutes).</b>
	<b>Aug 3</b>	<b>Final Written Exam</b>		<b>2 hour exam. DATE AND LOCATION TBC</b>

## APPENDIX I

### Before Class

**Review the slides for the lab, the chapter material and Pre-lab Questions (you are encouraged to complete the pre-lab questions before beginning the day's lab, but they are not required and you do not need to submit them).**

1. What is the usable range of a P-1000 Rainin Pipetman?
  - a. 100-1000 uL (technically 200-1000 uL)
2. What is the difference between accuracy and precision?
  - a. Accuracy describes how close the measured value is to the true (or predicted) value, defined by the arithmetic mean (% error). While precision describes how close multiple measured values are to each other, defined by measurements of precision (mean deviation)
3. What should 100 uL of water weigh?
  - a. Water has a density of 1000 kg/m<sup>3</sup>, therefore 100 uL of water should weigh 0.1 g.
4. What should 1000 uL of water weigh?
  - a. See Q3, therefore 1000 uL should weigh 1 g.

### Prelab Quiz (5 points, included in lab report grade)

Read the slides that are on Blackboard. Read the "Experimental Procedures" and "Analysis of Results" section and be able to describe the activities that you will be doing during the lab period. The questions on the quiz will assess your familiarity with the goals and basic procedure of the day's lab, as well as pre-requisite knowledge.

### Lab report (50 points, unless indicated)

**Lab reports must be typed and submitted as a single document to Blackboard before the following lab period.**

**Any calculations required on your lab report may be hand written, and inserted as an image, but must be written in ink, organized, legible and easy to follow. This applies to calculations ONLY. Any text must be typed. If your handwriting is sloppy, you should type your calculations using the equations function in Word. If your TA has trouble reading the calculation, they will award no points for them.**

**USE THE RUBRIC AND GRADING KEYS TO ASSIST IN WRITING YOUR LAB REPORT!**

## APPENDIX II: RUBRIC FOR LAB REPORTS

	<b>Poor</b>	<b>Fair</b>	<b>Good</b>	<b>Excellent</b>
<b>General</b>	Title of report not included. Body of the report has handwritten sections, difficult to follow, poorly organized with insufficient section/question headings. Sections may be omitted. Tables are hand-recorded, and graphs hand-drawn; both may be mis-labelled and lack titles. Calculations are "cramped" in an effort to use less space. Numerous spelling and grammar errors. Personal pronouns and incorrect tense used.	Title of the report relates to the method, rather than aim of the experiment. Body of the report is mainly typed. Organization of report is somewhat difficult to follow. There may be some units of measurement and/or table/graph titles omitted, or mis-labelled. Spelling and grammar is relatively error-free.	Title of the report is accurate and descriptive. Body of the report is typed. Sections are well laid out with clear headings. There may be occasional (but not all) units of measurement omitted, and/or table/graph titles omitted, or mis-labelled. Spelling and grammar is error-free.	Title of report is accurate and descriptive. Body of the report is typed. Sections are well laid out with clear headings. All units of measurement included appropriately and graphs are fully labelled and titled. Spelling and grammar is error-free.
<b>Introduction</b>	Does not relate to the problem, but rather just states the method used to solve the problem. Stated as an incomplete sentence, and/or with poor spelling and grammar. Appropriate tense not used.	Relates somewhat to the problem, but may be focused more on the method rather than the task that was performed. Is missing important background information on the molecule being studied or the method used. Attempts to use scientific vocabulary; use of correct tense is inconsistent.	Relates very well to the problem/task, as well as the method used. Explains WHY and HOW the experiment will be completed. Includes background information on molecules being studied and methods used. Uses proper science vocabulary, and appropriate tense (present, or simple past if citing).	Relates very well to the problem/task, as well as the method used. Explains WHY and HOW the experiment will be completed. Includes background information on molecules being studied and methods used. Uses proper science vocabulary, and appropriate tense (present, or simple past if citing).
<b>Hypothesis</b>	Omitted, vague, or is more than 1-2 sentences. The Hypothesis relates only to the techniques used in the experiment, not the goal/aim of the experiment.	The stated hypothesis is not tested by the experiment.	The hypothesis is stated concisely and is, in the most part, tested by the experiment. The hypothesis relates to the goal of the experiment, NOT the technique being performed.	The hypothesis is stated concisely and is tested fully by the experiment. The hypothesis relates to the goal of the experiment, NOT the technique being performed.
<b>Results: Data/Calculations /Analysis/Questions</b>	Data missing from the data table. Tables, diagrams or graphs are omitted, mislabeled, untitled, or illegible. Units of measurement are omitted. Calculations are incomplete or incorrectly performed.	Occasional mis-labelling of data tables or graphs, or units or measurement omitted, making interpretation difficult. Tables/graphs are incomplete or untitled. Calculations may be incomplete or difficult to follow.	Labelled and titled data tables, other observations, and diagrams/graphs are included to adequately describe what was observed. Units of measurement are included. Calculations are complete, labeled and easy to follow.	Labelled and titled data tables, other observations, and diagrams/graphs are included to adequately describe what was observed. Units of measurement are included. Calculations are complete, labeled and easy to follow. Text is included to explain the results.
<b>Discussion/Conclusion</b>	Incomplete paragraph was attempted (less than five (5) sentences), or paragraph contained merely a summary of the procedure. No inferences were made to explain observations. No attempt was made to explain why the experiment worked well, or, if it was not successful, what could be done the next time to increase the likelihood of success. No attempt was made to address whether the data supported the hypothesis. Incorrect tense and personal pronouns used.	A statement is made but not supported by the data. Very few explanations about observations are made. Hypothesis is restated but not clearly supported or denied through data. Needs to explain trends or patterns in the data. Incorrect tense and personal pronouns used.	A statement is made of what was observed and is supported by the data. Inferences are made explaining the observations made. Use of scientific vocabulary is made in offering adequate explanations. The hypothesis is restated and supported or denied by the evidence from the data. Trends and patterns are described. Past perfect tense used and personal pronouns omitted.	A clear statement is made of what was observed and is supported by the data. Inferences are made explaining the observations made. Use of scientific vocabulary is made in offering adequate explanations. The hypothesis is restated and supported or denied by the evidence from the data. Trends and patterns are described. Recommendations are made for follow-up experiments. Past perfect tense used and personal pronouns omitted.

### APPENDIX III: GRADING KEY FOR LAB REPORTS

#### Grading key Lab 1: Accuracy and Precision of Pipettes – 20 points

	Excellent	Good	Fair	Poor
Introduction	2	1.5	1.25	0-1
Data table	14-15	11-13	8-10	0-9
Discussion	3	2.5	2	0-1
Total Points	20			

#### Grading key Lab 2: Acids and Bases (Buffers) – 45 points

	Excellent	Good	Fair	Poor
Introduction	6	5	4	0-3.5
Results: Buffer calculations from slides	18-20	16-17	12-15	0-11
Results: Chapter calculations 3-8 (pg 58-59)	12-13	10-11	8-9	0-7
Discussion	6	5	4	0-3.5
Total Points	45			

#### Grading key Lab 3: Spectrophotometry – 45 points

	Excellent	Good	Fair	Poor
Introduction	6	5	4	0-3.5
Results: Data	8	7	5-6	0-4.5
Results: Analysis of results	9-10	8-9	6-7	0-6
Questions 1-7 (pg 80-81)	14-15	11-13	8-10	0-9
Discussion	6	5	4	0-3.5
Total Points	45			

#### Grading key Lab 4a&b: Lactate Dehydrogenase Purification I: Salt Precipitation – 45 points

Lab has TWO PARTS. Only one lab report due when both lab sessions are complete! When the first part is complete, you must submit your data table only. Failure to do this will result in a 10 point penalty. There will be a pre-lab quiz each week.

	Excellent	Good	Fair	Poor
Introduction	6	5	4	0-3.5
Hypothesis	2	1.5	1.25	0-1
Results: Data	6	5	4	0-3.5
Results: Calculations	16-17	14-15	11-13	0-10
Results: Questions 1-4 (pg 117)	6	5	4	0-3.5
Discussion	8	6-7	5	0-4
Total Points	45			

**Grading key Lab 5: Lactate Dehydrogenase Purification II: Gel Filtration Chromatography – 45 points**

	Excellent	Good	Fair	Poor
Introduction	6	5	4	0-3.5
Hypothesis	2	1.5	1.25	0-1
Results: Data	6	5	4	0-3.5
Results: Calculations	12-13	10-11	8-9	0-7
Results: Questions 6-9 (pg 206-207)	8	6-7	5	0-4
Discussion	10	8-9	6-7	0-6
Total Points	45			

**Grading key Lab 6: Lactate Dehydrogenase Purification III: Ion-exchange chromatography – 45 points**

	Excellent	Good	Fair	Poor
Introduction	6	5	4	0-3.5
Hypothesis	2	1.5	1.25	0-1
Results: Data	7	6	5	0-4
Results: Analysis of Results	18-20	16-17	12-15	0-11
Discussion	10	8-9	6-7	0-6
Total Points	45			

**Grading key Lab 7: Experimental Design Protocol: Cellobiase Purification – 75 points**

**This lab report must be submitted prior to the Week 11 Lab on Mar 24-25-26.** This is NOT a group report. There will be no Pre-Lab Quiz this week. During the Lab session, we will work to refine and improve your protocols to be used in Labs 8-10. Sample experimental design protocols will be available on Blackboard for guidance on style, and how much detail is expected.

	Excellent	Good	Fair	Poor
Introduction	14-15	11-13	8-10	0-7.5
Hypothesis	9-10	7-8	6-7	0-5.5
Materials	14-15	11-13	8-10	0-7.5
Protocol	27-30	22-26	18-25	0-17
Predicted outcomes	5	4	3	0-2.5
Total Points	75			

**Grading key Lab 8: Cellobiase Purification I: Salt Precipitation – 20 points**

	Excellent	Good	Fair	Poor
Introduction	2	1.5	1.25	0-1
Hypothesis	1	0.8	0.7	0-0.6
Method	2	1.5	1.25	0-1
Results: Raw Data	2	1.5	1.25	0-1
Results: Calculations & graphs	9-10	7-8	6-7	0-5.5
Discussion	3	2.5	2	0-1.5
Total Points	20			

**Grading key Lab 9: Cellobiase Purification II: Gel Filtration Chromatography – 20 points**

	Excellent	Good	Fair	Poor
Introduction	2	1.5	1.25	0-1
Hypothesis	1	0.8	0.7	0-0.6
Method	2	1.5	1.25	0-1
Results: Raw Data	2	1.5	1.25	0-1
Results: Calculations & Graphs	9-10	7-8	6-7	0-5.5
Discussion	3	2.5	2	0-1.5
Total Points	20			

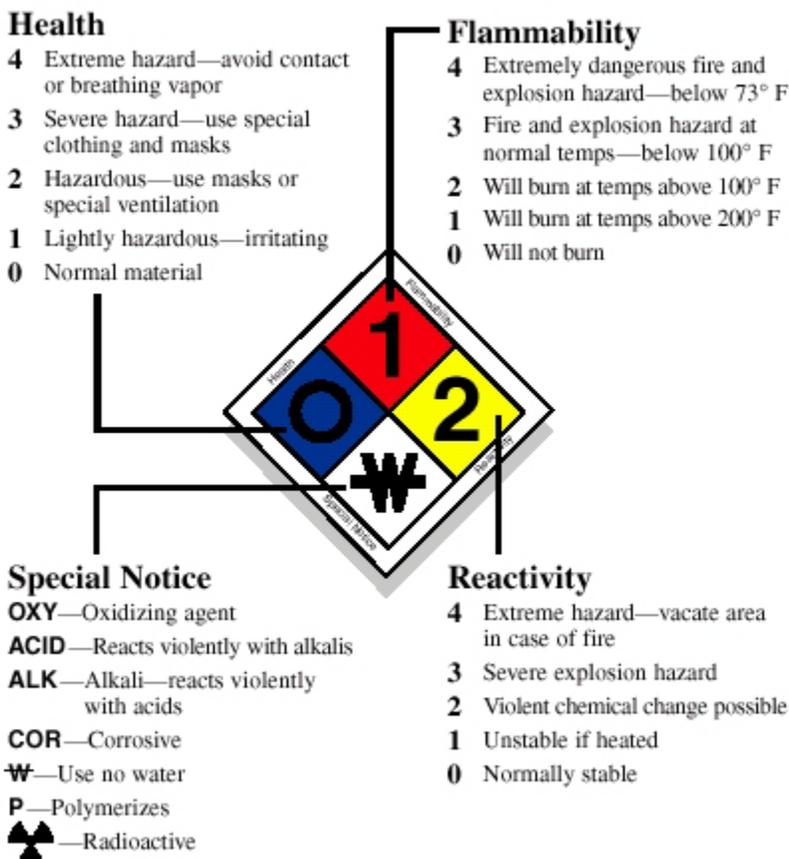
**Grading key Lab 10: BIG REPORT!! You should include the data from Lab 10 (Cellobiase Purification III: Ion-exchange chromatography), but also combine your data from Labs 8&9. Your introduction and discussion should be comprehensive. Use your original Experimental Design protocol (Lab 7) for guidance, but the protocol in this report MUST be what you actually did in lab! – 100 points**

	Excellent	Good	Fair	Poor
Introduction	14-15	11-13	8-10	0-7.5
Hypothesis	5	4	3	0-2.5
Protocol/Method	27-30	22-26	18-25	0-17
Results: Raw Data	9-10	7-8	6-7	0-5.5
Results: Calculations & graphs	23-25	19-22	16-18	0-15
Discussion	14-15	11-13	8-10	0-7.5
Total Points	100			

1. Approved safety goggles (with sideguards) must be worn by all persons (faculty/instructors, teaching assistants and students) in the laboratory any time there is work in progress by anyone. If you do not have safety goggles, they will be provided to you.
2. Lab coats must be worn by all persons (faculty/instructors, teaching assistants and students) in the laboratory any time there is work in progress by anyone. Lab coats may be purchased at the University Book Store, or Follet's. You will not be permitted to take part in any lab activity without your lab coat. All PPE should be removed before you leave the lab.
3. Eating, chewing gum, and/or drinking in the laboratory is strictly forbidden.
4. Many laboratory chemicals/reagents are toxic. If instructed to smell reagents, do so with great caution, and NEVER put your nose over the bottle! Avoid looking into the mouth of any reaction vessel or test tube; instead, view from the side. Never point a test tube at anyone.
5. Proper attire must be worn at all times. Closed-toe shoes are required at all times in the lab. The hemlines of shorts, skirts and dresses must be no higher than knee-length. Failure to adhere to the dress code will result in a grade penalty for the first occurrence, and you may be asked to leave the lab for further occurrences.
6. Hair that reaches the shoulders or longer must be tied back. Caps or hats must not be worn.
7. No one will perform any unauthorized experiments, nor will students work in the lab alone, or outside of regularly scheduled hours.
8. Keep a clean working area. Books, book bags, jackets etc. and paper should not clutter the workbench. Keep chairs and book bags recessed under cabinets when not in use.
9. Do not leave the lab until you have cleaned up your work area and returned supplies and equipment to the appropriate area if necessary.
10. Follow the guidelines of your instructor or teaching assistant when handling any hazardous materials. Be aware of the safety labeling on containers to identify risks associated with the materials.



## Sample Warning Label



11. Follow the guidelines of your instructor or teaching assistant for waste disposal. Dispose of the excess chemicals in the proper waste container, as indicated by the lab instructor or teaching assistant.
12. When pouring something out of a reagent bottle, always **READ THE LABEL TWICE** to be certain that you are using the correct material.
13. Label all chemical containers and test tubes before use to avoid mix-ups.
14. If you spill something, **clean it up (GET HELP WITH HAZARDOUS MATERIALS)!** Wash your hands immediately after skin contact with any chemical reagent. Also wash them after lab. If liquids drip down the side of the bottle, while pouring, wash the bottle off.
15. **NEVER** return excess chemicals to the reagent bottle.
16. Exercise care when handling glass.
  - a. Do not use broken or chipped glassware.
  - b. Do not leave pipettes sticking out of bottles, flasks or beakers.
  - c. Do not attempt to remove stoppers on glass tubing by force.
  - d. Hot glass must be handled with heat-resistant gloves, and any container containing heated materials must remain vented and be handled with extreme caution.
17. Do not operate centrifuges without supervision from instructor or teaching assistant.

## GENERAL SAFETY AND FIRST AID

18. Aisles and exit routes must not be obstructed in any way. Therefore, keep the stools pushed under or next to the bench. Keep book bags and other personal items where they will not be an obstruction hazard.
19. Report all accidents of any type to your instructor immediately. This includes electrical shocks, chemical spills, and bodily exposure to chemicals, biologics and all other types of exposures and/or injuries.
  - a. The instructor, in consultation with the teaching lab coordinator, if necessary, will evaluate the exposure, counsel the student, and treat the exposure as deemed appropriate.
  - b. If deemed necessary, the student will be referred to PUSH for consultation/medical treatment.
  - c. An Incident Report Form must be completed for all exposures and/or injuries that occur in the teaching lab (BCHM 107) and a copy provided to the student and teaching lab coordinator.
  - d. In the case of ANY incident resulting in injury to a student, the student is advised to receive medical attention from PUSH. Department of Biochemistry lab personnel are not medical professionals, and medical opinions can only be obtained from PUSH.
20. An eyewash station and safety shower are located next to the sink on the north end of the lab. These should be used in the event of exposure of the eyes to hazardous materials or skin exposure to hazardous materials that cannot be managed using a faucet at the sink. Do not hesitate to use these if an exposure to hazardous material has occurred.
21. A first aid cabinet is located in the laboratory. Notify the instructor when items are used so supplies may be replaced.
22. In the case of fire in the lab, immediately notify the instructor or teaching assistant and use the RACE acronym:
  - a. REMOVE anyone from danger.
  - b. ALARM – activate the fire alarm first. Then call 911.
  - c. CONTAIN – contain the fire, close doors and windows etc. when leaving the area.
  - d. EXTINGUISH – Only if you have been trained in its use *and* it is safe for you to do so, use the fire extinguisher to control the fire.

NOTE: There is a carbon dioxide fire extinguisher in the lab to the right of the whiteboard. Do not attempt to use it unless you have been trained in its use. It may be used on liquid fires and electrical fires only.

### 23. EVACUATION PROCEDURES

The building alarm will sound inside the building in the case of fire, or other emergency that requires your evacuation.

- a. If this alarm sounds, you must evacuate the building immediately.
- b. Shut off any equipment that you were using, remove personal protective equipment, gather your personal items if the situation permits and leave immediately through the main exit onto South University Street.
- c. Proceed to the emergency assembly area outside NLSN. Notify your instructor if you notice that one of your lab colleagues is no longer with your group. Do not leave this area without consulting directly with your instructor.

### 24. SHELTER-IN-PLACE PROCEDURES

The outdoor all-hazards alarm will sound if you need to shelter in place due to inclement weather (including tornadoes), hazardous materials release, active shooter or other civil disturbance.

- a. To shelter-in-place, follow the directions of your instructor.
- b. Do not leave the building unless you are cleared to do so by your instructor.

## Department of Biochemistry Teaching Laboratory (BCHM 107)

### Safety Rules

Student acknowledgement and declaration of cooperation.

Course: \_\_\_\_\_

Semester: \_\_\_\_\_

Instructor: \_\_\_\_\_

I have read the safety rules for the Department of Biochemistry Teaching Laboratory (BCHM 107), understand all of the procedures, and agree to abide by them. I understand that failure to comply with safety procedures could result in the suspension of my laboratory privileges or disenrollment from the course.

Signed \_\_\_\_\_

Date \_\_\_\_\_

**Department of Biochemistry Teaching Laboratory (BCHM 107)**  
**Incident Report Form – Undergraduate Student**

<b>Student Name:</b>	<b>Course:</b>						
<b>Major:</b>	<b>Instructor:</b>						
<b>Date/Time of incident:</b>	<b>Student Phone:</b>						
	<b>E-Mail:</b>						
<b>Witness(es):</b>							
<b>Description of incident: Include the use of Personal Protective Equipment, chemical hood or other environmental control, safety equipment (attach additional pages if necessary).</b>							
<b>Did the incident result in an injury: Yes <input type="checkbox"/> No <input type="checkbox"/></b> <b>Description of injury:</b>							
<b>Details of action taken:</b>							
<b>Did student indicate they would visit PUSH?: Yes <input type="checkbox"/> No <input type="checkbox"/></b>  <b>NOTE: The Department of Biochemistry asks students to visit PUSH to have all injuries evaluated by trained medical professionals.</b>							
<b>Emergency response information (include EH&amp;S, fire, police, ambulance response present at the scene):</b>							
<b>Copy of this completed form provided to:</b> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;"><b>Student:</b></td> <td style="width: 25%;"><b>Yes <input type="checkbox"/></b></td> <td style="width: 25%;"><b>No <input type="checkbox"/></b></td> </tr> <tr> <td><b>Teaching Lab Coordinator:</b></td> <td><b>Yes <input type="checkbox"/></b></td> <td><b>No <input type="checkbox"/></b></td> </tr> </table>		<b>Student:</b>	<b>Yes <input type="checkbox"/></b>	<b>No <input type="checkbox"/></b>	<b>Teaching Lab Coordinator:</b>	<b>Yes <input type="checkbox"/></b>	<b>No <input type="checkbox"/></b>
<b>Student:</b>	<b>Yes <input type="checkbox"/></b>	<b>No <input type="checkbox"/></b>					
<b>Teaching Lab Coordinator:</b>	<b>Yes <input type="checkbox"/></b>	<b>No <input type="checkbox"/></b>					
<b>Instructor Signature:</b>	<b>Student Signature:</b>						
<b>Date:</b>	<b>Date:</b>						