

BIMM 101 Recombinant DNA Techniques**Fall 2014**

Dr. Goran Bozinovic
gbozinovic@ucsd.edu
HSS 1145G

Office hours: F 1-2
York 4332

Flagg, Matthew Paul	mflagg@ucsd.edu
Lubin, Johnathan William	jlubin@ucsd.edu
Lilascharoen, Varoth	vlilasch@ucsd.edu
McCann, Thalia Marie	tmmccann@ucsd.edu

Lectures: Mon, Wed, Fri 9 – 9:50AM

CENTR 214

Labs: Wed, Fri 10-2; 3 - 7

York 4318, 4332

Course Website: [http:// ted.ucsd.edu](http://ted.ucsd.edu)

- Lectures will cover the theory behind the experiments performed in lab. The quizzes and exam will have questions on the material that will be covered during lectures.

Learning objectives:

- Learn the theory behind molecular techniques, and the applications of the methodologies in biological research
- Become proficient at basic molecular biology techniques
- Learn the importance of proper controls in designing experiments and interpreting results
- Improve lab math skills and ability to graph data correctly
- Learn to make logical conclusions from experimental data
- Become familiar with bioinformatics databases and applications
- Learn to find, read, and evaluate primary literature
- Become aware of the implications of the technology for society

Required texts:

BIMM 101 Lab Manual from University Readers

From Genes to Genomes by Dale (1st or 2nd edition) on reserve at BML and electronic version available from UCSD computer

<http://onlinelibrary.wiley.com/book/10.1002/0470856912>

Readings on TED (ted.ucsd.edu)

Required Materials – needed by second day of class:

Labcoat (the bookstore has cheap ones)

UV blocking safety glasses (also at bookstore)

Lab notebook with carbon copies (bookstore or Grove general store)

Fine point Sharpie for labeling – get a dark color

A calculator

Remember that lab attendance is required – if you miss two labs, you will be asked to drop the course. If you are ill, you must leave a message with your instructor, not your TA, and make up the lab in a way that we will determine. You must be on time for lab; the TAs go over the experiments at the beginning of lab, and also quizzes are administered then.

Course Requirements

1. Lab Notebook: It is mandatory that you keep a complete lab notebook. The notebook must contain everything that you did in the lab, including:

- Any changes in the protocol
- All data/results
- All calculations done during experiments
- Observations

2. Take home assignments: there will be two take-home assignments

- dilutions - 10 pts – Due on Oct 10th
- DNA quantification – 20 pts, Due on Oct 17st

3. Quizzes: There will be 4 scheduled quizzes (dates TBD) during lab periods. Each quiz is worth 10 points. They will be given at the beginning of lab, and collected 15 minutes later. If you arrive after the quiz has been handed out, you will not be able to make it up.

4. Lab Reports: 3 lab reports throughout the quarter are worth 100 points each. While you will be collecting and sharing data with a lab partner, and you are welcome to discuss your results with your classmates, you must hand in your own lab report, written in your own words. You will be penalized for copying another lab report or for handing in the same (or very similar, such as just a few words changed here and there) lab reports as your partner.

All lab reports should include:

1. *Purpose of the experiment:* this section should be BRIEF – no more than a few sentences: simply state why you are doing the experiment.

2. *Results* should include the following:

- data or data analysis
- figures, gels (or representations thereof)

- any sample calculations
- a brief statement about what each result means

3. Discussion:

- Note any unusual observations
- Discuss success or failure of the experiment – if there was a problem, discuss probable source.

Lab reports should have no more than 5 pages of text – figures can go on separate pages. More specific description of the lab report can be found in the course TED page. Although the lab report will be submitted electronically, all carbons from the labs associated with a lab report must be handed in class the day the lab is due.

Lab report - Late policy.

Lab reports are due at the beginning of lecture on the assigned due date (must be electronically submitted before 1 PM of the due date).

Penalty for turning lab reports late:

- **5 points** if handed in later on the same date;
- After the first late day, you lose **2 points/day**, so
- 7 points if handed in anytime the next day
- 9 points if handed in the 3rd day etc.

Lab report due dates:

<u>Labs to be included in the Lab Report</u>	<u>Due date</u>	
Labs 3-8A,	Nov 5	Lab Report #1
Labs 9-13A	Nov 26	Lab Report #2
Labs 16-18	Dec 12	Lab report #3

** Please submit your Lab Reports at the beginning of the lab. Lab reports 3 and 4 (submit them stapled together) should be submitted on the morning of the final exam on Monday, Dec 9th. You may also submit your reports to your TAs earlier.

5. Lab attendance: Attendance is taken within the first 15 minutes of every lecture session. If you are ill, please notify me (gbozinovic@ucsd.edu).

6. Lab performance: There are no points for lab performance per se. However, your effort, attitude, and the success of your experiments will be considered when assigning the final grade, especially if you are on the borderline between two grades. If you miss one lab with no excuse, you will lose 5% from your final grade. If you miss two labs, you will receive an F for the course.

7. Exams: There will be two exams – **Midterm** (100 pts) on Wednesday, Nov 14 at 9AM in the lab, and **Final exam** (125 pts) on Friday, December 12th. 9 AM in the lab. Final exam is cumulative. Depending on the performance of the class, the exam scores might be adjusted.

- The exam adjustment policy:

- 1) If any student receives a 100% on the exam it will NOT be curved;
- 2) If any student receives a score between 95 and 100%, that will be the new maximum score (for example if the highest grade is 96, everyone's score will increase by 4 points);
- 3) If the highest score is less than 95% then that student's score will be the new 95% (for example if the highest grade is 89, everyone's score will increase by 6 points).

Grading:

Dilution assignment	10 pts
Lab 2 (DNA quantification) assignment	20 pts
4 Quizzes (10 points each)	40 pts
3 Lab reports (100 points each)	300 pts
Midterm Exam	100 pts
Comprehensive Final Exam	125 pts

Total possible points: 595

Please make sure you regularly check your scores in TED to make sure no errors have occurred.

Letter grades will be assigned as follows:

Grade Overall class percentage

A+, A, A- 98, 92, 90

B+, B, B- 88, 82, 80

C+, C, C- 78, 72, 70

D+, D, D- 68, 62, 60

F Below 60

Note: Just coming to lab does not ensure that you will get a passing grade in the class. You must hand in all assignments and get passing scores on those assignments (an average of 70) to get a C- in the class.

Policy on cheating: Anyone caught cheating (which includes but it is not limited to plagiarizing lab reports, cheating on a test or quiz, or changing an answer for a regrade) will be reported to the Academic Integrity Office.

BIMM 101 Fall 2014 Student contract:

1. I understand that if I am late for lab on a day a quiz is given, I will not be allowed to take the quiz and will receive a 0 score for that quiz.

Name Date

All lab reports for the class must be independently written, i.e., **your own work in your own words**. While discussion of data among lab partners is encouraged, each student on their own must complete all text, references, figures, graphs, and tables. The submission of reports by lab partners that contain shared work is forbidden, and will result in points being deducted from both reports. The exception to this is when a figure is the raw data that is supplied to each member of the group (specifically absorption spectra and gel photographs). In this case the labeling of that figure must be done independently. If you have questions about the difference between discussing your work with others and unauthorized collaboration, please ask your instructor or T.A. for clarification.

Because lab reports are to be your own work in your own words, you may not copy to any extent current or past laboratory reports that were written by other students. This is known as plagiarism, which is a direct attempt by the student to present the work of others as his/her own, and is no different than cheating on an exam. Directly copying material from other sources without putting it in your own words is also plagiarism, even if the source is cited as a reference. Plagiarism in lab reports is rigorously sought out and penalized. Students are required to upload an electronic version of each lab report to Turnitin.com, where the report is screened with a plagiarism checker against all reports in the Turnitin database. All incidents of plagiarism will automatically be turned in to the Academic Integrity Coordinator. Following UCSD's Policy on Integrity of Scholarship (www-senate.ucsd.edu/manual/appendices/app2.htm), students found to have committed plagiarism or other academic misconduct will receive both an administrative (decided by the Council of Deans) and academic penalty (decided by the instructor). Furthermore, all submitted reports are retained in the Turnitin database. Similarity hits by the plagiarism checker will also reveal the name of the student who provided the plagiarized material. Giving one's own lab report to other students to allow them to copy material from that report is also academic dishonesty, and will be pursued and penalized as rigorously as for the student committing the plagiarism.

2. I understand that if I plagiarize a lab report and it is detected by Turnitin.com, the matter will go to the Academic Integrity Office on campus. I also understand that if I give a lab report to a student who takes the lab in a subsequent quarter, and he or she plagiarizes my lab report, I will also be subject to disciplining by the Academic Integrity Office.

Name Date

Date	Class	Labs in manual	Experiments
10/3	1	1	Dilutions
10/8	2	2	Agarose gel
10/10	3	3 and 4	Start Vibrio DNA extractions; Finish Vibrio DNA extraction
10/15	4	5	Quantitate Vibrio DNA using nanodrop Set up digest of Vibrio DNA and pGEM Intro to reading scientific papers
10/17	5	6	Check digests on gel Set up ligation of Vibrio DNA and pGEM Practice bacteriological techniques
10/22	6	7	Check digests on gel; Transform cells
10/24	7	8	Check for glowing colonies Paper discussion? Remind students to bring laptops next lab
10/29	8	9	PCR lux AB Start overnights from non-glowing whites Bioinformatics 1
10/31	9	10	Purify plasmids from non-glowing white colonies Check PCR product on gel and clean-up Digest PCR product and pGEM
11/5	10	11	Clean up and quantitate digests on gel (1 hour) Quick ligation of luxAB into pGEM (1 hour) Transformation and plate cells LAB REPORT 1 Due
11/7	11	12 A, B	Check glowing colonies Bioinformatics 2
11/12	No lab		Veterans day
11/14	12	16A 12C	Observe worms and induce with IPTG Extract bug DNA and set up barcode PCR MIDTERM EXAM in LAB 9 AM
11/19	13	17 A, B	Extract RNA from worms and set up qRTPCR
11/21	14	18A, 13C	Analyze RTPCR results – we do not have all computer labs this day! Check barcode PCR on gel – clean up and send for sequencing Hike
11/26	15		Take home assignment – barcode or Micro RNA paper Run gels of re-dos LAB REPORT 2 DUE
12/3	16	Part A and B of lab 14	Isolate cheek cell DNA and set up PCR Analyze barcode results part1
12/5	17	Part A and B of lab 15	Digest PTC PCR and run gel Analyze barcode results part2
12/10	18		Paper discussion/review
12/12			FINAL EXAM – in Lab LAB REPORT 3 DUE