Welcome to BIMM 101: Recombinant DNA Laboratory! In BIMM101 we aim to function as an inclusive learning community to develop an understanding of experimental design, common molecular biology lab techniques, critical analysis of data and literature, and experimentation. We will do most of our exploration by working through a CRISPR editing experiment.

Teaching Team:

Instructor:	Dr. Jessica Rusert	jrusert@ucsd.ed
IA for A01	Mandy Zhu	mxzhu@ucsd.edu
IA for A02	Bindhu Hosuru	bhosuru@ucsd.edu
IA for A03	Casey Cheng	c2cheng@ucsd.edu
IA for A04	Sabrina Lin	scl001@ucsd.edu

Lecture: A00 : MWF 12 - 12:50pm Center 214

All lectures will be in-person. No points will be associated with attending lecture, so attendance is not mandatory, but you are responsible for knowing the content covered and **highly encouraged** to attend to maximize your learning. Lectures will be recorded and posted in the Media Gallery automatically. I will embed these into the weekly course pages as time permits. **NOTE:** If there is a tech error in a podcast, such as audio that goes out during a lecture, I will not re-record the material. You can get notes from another student, speak with me during lab, or come to my office hours to go over the material missed. If that does not sound sufficient, then please plan to attend lectures in-person.

Generally Monday lectures will introduce the Tue/Wed lab for that week, the Wednesday lecture will introduce the Thur/Friday lab that week, and the Friday lecture will cover anything we haven't gotten to and possibly a discussion of what you did in lab. **NOTE:** Because of the wonky schedule with the Wed. lecture that will cover the Thurs/Friday lab happening BEFORE those of you with a Wednesday lab, please realize we will not be covering the Wed. lab in the Wed. lecture. Please understand that this is best way that I could figure out how to manage the schedule I was given between the T/Th and W/F labs with the noon MWF lectures. If this feels disjointed to those of you in Wed. lab, you may choose to watch the lecture for your Friday lab at a

later time. In the real world, research is never focused on one project at a time. We constantly plan ahead for multiple experiments while concurrently carrying out other experiments (consider ordering supplies and reagents before you plan to do the experiments and coordinating cells, viral preps, and mice for instance all to be ready for a combined experiment at a future date).

Laboratory Schedule: All lab classes will be in-person, unless otherwise stated. Download the **full 10 week lab schedule**Download full 10 week lab schedule. Also pasted below.

Tu/Thu: A01 : 9:30 - 1:20 pm York Hall 2310

A02 : 9:30 - 1:20 pm York Hall 2332

W/F: A03 : 1 - 4:50 pm York Hall 2310

A04 : 1 - 4:50 pm York Hall 2332

Attendance in laboratory is required. Attending the first lab is required to maintain your seat in the course. If you do not show up within the first 15min of lab your spot will be given to someone on the waitlist.

Missing any laboratory session after the first one without a reasonable excuse and proof (e.g. medical or family emergency) will automatically result in a 2% deduction in your final course grade. Please be on time for laboratory sessions. Multiple late attendances will result in additional lost points due to lack of professionalism (see below).

Additional policies are available online (https://biology.ucsd.edu/education/undergrad/course/ug-labs/index.htmlLinks to an external site.)

Office Hours: Monday 1-2pm location TBD

Being proactive and ask questions during office hours is something I value and appreciate – please ask whatever questions you may have about course material. I'm also more than happy to chat about other topics (e.g., career goals (or confusions!), hobbies, other projects, research…..). Also – please make use of time in the lab to talk.

Learning goals:

- Apply knowledge of the theory behind molecular techniques, and the applications of the methodologies in biological research, to explain experimental steps and troubleshoot results
- Apply knowledge of molecular biology concepts relevant to our work to explain and troubleshoot results
- Demonstrate proficiency at basic molecular biology techniques
- Explain the importance of proper controls in designing experiments and interpreting results
- Perform basic lab math skills, statistical analysis, and graphing
- Draw logical conclusions from experimental data and justify conclusions
- Use basic bioinformatics databases and applications
- Learn to find, read, and evaluate primary literature

Learning in this course

This course is designed to be a collaborative environment for everyone to learn together and construct a shared understanding of the material. Active participation both in class and lab is expected. Being able to communicate understanding, and confusion, is critical to success in any discipline, and is very useful for learning[1]Links to an external site..

Lecture and lab time will be used to work on applying knowledge and troubleshooting your data. Hence, it is expected that you will prepare before coming to class/lab, reviewing basic background information about the lab and/or relevant content.

Instead of memorization, we will focus on developing an understanding of fundamental concepts and as they apply to the experiments. Therefore, tests will include questions that are based on solving problems in new contexts or data interpretation and not necessarily on memorizing facts.

Smith et al., 2009. http://www.sciencemag.org/content/323/5910/122.shortLinks to an external site.

Safety

Safety precautions are crucial in the laboratory setting. Biology lab safety training and assessment (https://biology.ucsd.edu/education/undergrad/course/ug-labs.htmlLinks to an external site.) must be completed by the **beginning of the second lab** in week 1. Appropriate laboratory attire and personal protective equipment (PPE) are required, including laboratory coats that cover to the knees, UV-blocking safety glasses or googles, long pants or equivalent, long socks or equivalent, and closed-toe and closed-heel shoes.

Masks are required in lecture and lab at all times per COVID protocols.

There is no eating or drinking allowed in lab (for eating and drinking and mask breaks please step outside)**.**

Grading

BIMM101 has multiple grading components:

Exams 1 & 2 (2 grading scheme options)	12.5 & 12.5 %, OR 20% for best one + higher % final exam
Lab notebooks	22
Molecular Biology Review Quiz	3
CRISPR 'Lab' report	26
Final Exam	20% OR 25%
Professionalism	4
Total	100

Exams. Exams 1 & 2 will be held in-person during lecture time on Friday Oct. 21st and Wednesday Nov. 9th. The final exam will be held during your last scheduled lab time, either Thursday or Friday. These dates will not be changed, so plan your quarter accordingly. NO MAKE-UP Exam 1 or 2 will be given for any reason (***unless you have an OSD exemption***).

You will be allowed to use your lab manual, including any notes you've written in it, during each of your exams. I encourage you to get familiar with your manual, add sticker tabs to easily find sections, and add in important information as we move through this class.

There are 2 grading scheme options above in yellow versus green. Whichever gives you the highest final grade will be used to determine you grade. This can only be done in Excel, not in Canvas, at the end of the quarter and you do not have to ask me to use a certain grading scheme. The higher grade will be used automatically. If you wish to

determine your grade before that, you will have to calculate your own potential grades using the "What if" option in Grades or by doing the algebra yourself.

By building in the flexibility of the grading scheme, if you must miss either Exam 1 or 2 for any reason, the weight will be shifted to the other Exam and the Final. You do not need to email me to let me know why you cannot take either Exam 1 or 2. You will get a 0 on a missed midterm, but this will be dropped when calculating your final grade in favor of the green grading scheme above. For extenuating circumstances that interfere with your ability to take the final (i.e. hospitalization), please contact me to discuss your circumstances and options.

Lab notebooks: Each student will be assigned an individual digital lab/research notebook (Google Doc) that you will use for the quarter. These will be made available through the Canvas Site and via email to you directly. Complete and organized lab notebook entries are a critical part of effective work in a research lab. As such, we expect students to practice good lab notebook entry habits. You will have until 11;59pm the night after the lab to complete each entry. Please consult the lab notebook guidelines (Canvas), which includes a link to an example notebook. **Lab notebook entries will be regularly and randomly checked for both before-lab work and in-lab** work. In total, at least 8 entries will be checked and scored. The two lowest scores will be dropped. ***If you find yourself unable to complete up to two lab notebook entries because of illness or family emergency there are no extensions – those missed entries will count as the two low scores to be dropped.*** You can see what we expect in the **following example**Links to an external site..

Molecular Biology Review Quiz: A quiz on some background molecular biology and experimental design concepts will be given in class. Quizzes will be scored on 1 point for effort and completion and 1 point for correctness. Instructions to take and submit the quiz will be posted on Canvas in Week 0 of the Home page.

Lab Report Write-ups: The goal of the write-up is to write a short scientific article to present results of the CRISPR experiment, including an introduction, methods summary, presenting and summarizing results, as well as constructing scientific arguments (what you can conclude, evidence to support, and providing reasoning biological/molecular/experimental explanations or hypotheses). A draft will be submitted for peer-review, and then a final version will be submitted. Consult course schedule for due dates, and guidelines/rubrics will be provided on Canvas.

Professionalism: This portion of the course grade is intended to motivate students to consider the impact of their actions on their own learning and the learning of others in the course. Unprofessional interactions consume time yet have no meaningful benefits

to you, your fellow students, and/or the teaching team. Analogously in the workplace, being unprofessional to your colleagues or supervisors will only discount you. When you are discounted, you will not be invited for new opportunities that you may or may not be aware of. Professionalism can be demonstrated through individually demonstrating meaningful participation in the course (especially during lab time), maturity and respectful behavior towards others.

By default, every student is assumed to be professionally mature. Hence, this component is awarded to every student at the beginning of the quarter. During the quarter, based on observations by the teaching team, which includes but is not limited to participating in lab sessions, one-on-one interactions, electronic communication, contributing data to class data sets according to deadlines, and follow-up conversations on grades, your professionalism credit may be deducted.

Example interactions with meaningful benefits:

- Actively participating in lab sessions, which includes being prepared to engage in discussions and ask questions.
- Developing deeper insight into course material, concepts, biology, and/or society in general
- Working collaboratively to improve in skill building and future opportunities
- Contributing to an inclusive learning environment
- Learning conceptually and meaningfully why full credit was not awarded for an assignment
- Clarifying course material that facilitates deeper learning
- Reporting errors or problems in class, on assignments, or for other course material

- Arriving on-time to lab sessions and being prepared to work in lab

Example interactions that have no meaningful benefits and thus should be avoided:

- Not showing up or being late to lab session
- Contributing inequitably to team work
- Harassing and/or bullying the instructional team or other students, either in person or online
- Asking questions when the information is already available or will eventually be known (this does not include asking clarifying questions about content/concepts)
- Ignoring the directions or requests from the instructional team
- Unprofessional behavior in lab (e.g., not respecting the working environment of others, using unprofessional language)

Late and missed assignments

Assignments must be submitted on time to be eligible for full credit. Except in the case of medical or family emergencies, late assignments will be subjected to a 10% deduction per day if submitted within 48 hours after the posted due date. Assignments not submitted within 48 hours of the due date will receive a score of 0.

Grades will be based on your percentage in the course:

97+ = A+	94 up to 97 = A	90 up to 93= A-
87 up to 89 = B+	83 up to 86 = B	80 up to 82 = B-
76 up to 79 = C+	72 up to 75 = C	67 up to 71= C-
60 up to 66= D	Below 60 = F	

This course is not graded on a curve (i.e. 20% of students getting A, B, C, and such), and the ability to do well in the course is not dependent on others doing poorly.

Extra Credit

I have created a non-traditional and, dare I say, *fun* (intriguing, helpful, influential....?) extra credit assignment that is optional, to be completed by Nov. 27th at 11:59pm or anytime before then (you can do it now!). Please see the assignment details here: Happiness Lab Podcast Extra Credit Option

Technical Support

For help with accounts, network, and technical issues: https://acms.ucsd.edu/contact/index.htmlLinks to an external site.

For help connecting to electronic library resources such as eReserves and e-journals:

https://library.ucsd.edu/computing-and-technology/connect-from-off-campus/Links to an external site.

Academic integrity (https://students.ucsd.edu/academics/academic-integrity/index.htmlLinks to an external site.)

Integrity of scholarship is essential for an academic community. The University expects that both faculty and students will honor this principle and in so doing protect the validity of University intellectual work. For students, this means that all academic work will be done by the individual(s) to whom it is assigned, without unauthorized aid of any kind. Anyone caught cheating (includes plagiarizing lab reports, cheating on a test, or changing an answer for a re-grade) will be reported to the Academic Integrity Office.

Inclusion and Accessibility

Any student with a disability is welcome to contact us early in the quarter to work out reasonable accommodations to support your success in this course. Students requesting accommodations for this course due to a disability must provide a current Authorization for Accommodation (AFA) letter issued by the Office for Students with Disabilities (OSD), which is located in University Center 202 behind Center Hall. Students are required to present their AFA letters to faculty and to the OSD Liaison in the Division of Biological Sciences in advance so that accommodations may be arranged.

For further information

Contact the OSD:

858-534-4382Links to an external site. | http://disabilities.ucsd.eduLinks to an external site. | osd@ucsd.edu |

Office of Equity, Diversity, and Inclusion:

858.822.3542 | diversity@ucsd.edu | https://diversity.ucsd.edu/Links to an external site.
https://students.ucsd.edu/student-life/diversity/index.htmlLinks to an external site.

Student Resources for Support and Learning

There are many **resources on campus** that are directed to supporting your intellectual development. Do not be shy to make the most of these resources.

DISCRIMINATION AND HARASSMENT

The University of California, in accordance with applicable federal and state laws and university policies, does not discriminate on the basis of race, color, national origin, religion, sex, gender, gender identity, gender expression, pregnancy (including pregnancy, childbirth, and medical conditions related to pregnancy or childbirth),

physical or mental disability, medical condition, genetic information, ancestry, marital status, age, sexual orientation, citizenship, or service in the uniformed services (including membership, application for membership, performance of service, application for service, or obligation for service in the uniformed services). The university also prohibits harassment based on these protected categories, including sexual harassment, as well as sexual assault, domestic violence, dating violence, and stalking. The nondiscrimination policy covers admission, access, and treatment in university programs and activities.

If students have questions about student-related nondiscrimination policies or concerns about possible discrimination or harassment, they should contact the Office for the Prevention of Harassment & Discrimination (OPHD) at (858) 534-8298, https://ophd.ucsd.edu/Links to an external site. , or http://ophd.ucsd.edu/report-bias/index.htmlLinks to an external site.

Campus policies provide for a prompt and effective response to student complaints. This response may include alternative resolution procedures or formal investigation. Students will be informed about complaint resolution options. A student who chooses not to report may still contact CARE at the Sexual Assault Resource Center for more information, emotional support, individual and group counseling, and/or assistance with obtaining a medical exam. For off-campus support services, a student may contact the Center for Community Solutions. Other confidential resources on campus include Counseling and Psychological Services, Office of the Ombuds, and Student Health Services.

CARE at the Sexual Assault Resource Center: 858.534.5793 | sarc@ucsd.edu | https://care.ucsd.eduLinks to an external site.
Counseling and Psychological Services (CAPS): 858.534.3755 | https://caps.ucsd.eduLinks to an external site.