

Course Syllabus


 [Edit](#)

Teaching Staff:

Instructor:	Chris Day	cdday@ucsd.edu
IA for C01	Christina Liem	cliem@ucsd.edu
IA for C02	Casey Cheng	c2cheng@ucsd.edu
IA for C03	Terry Lin	lwlin@ucsd.edu
IA for C04	Jeffrey Lin	jel304@ucsd.edu

Lecture: C00 : Tu/Th 5-6:20 pm TATA 3201

All lectures will be recorded and posted in the Media Gallery and embedded into the weekly course pages.

Laboratory Schedule: There will be In-person-labs and Zoom-labs. See the [full 10 week lab schedule](https://canvas.ucsd.edu/courses/29383/files/5048008/download?download_frd=1)  (https://canvas.ucsd.edu/courses/29383/files/5048008/download?download_frd=1) to determine when we will be on Zoom vs in the lab.

In-Person-Lab: Usually Fri, but a few exceptions, refer to lab schedule for exceptions.

C01 : 8:30-12:20 pm York Hall 2310

C02 : 8:30-12:20 pm York Hall 2332

C03 : 1-4:50 pm York Hall 2310

C04 : 1-4:50 pm York Hall 2332

Zoom-Lab: Usually Wed, but a few exceptions, refer to lab schedule for exceptions.
Meeting ID numbers found in the ZOOM LTI Pro tab.

C01 : 8:30-10:30 am

C02 : 10:20-12:20pm

C03 : 1-3 pm

C04 : 2:50-4:50pm

Office Hours: TBA (see link in the Zoom LTI PRO tab)

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 learning¹

(<http://www.sciencemag.org/content/323/5910/122.short>). To encourage communication and collaboration, we will frequently use Zoom-lab time to work on problems in groups.

We like to use class time to work on applying knowledge, troubleshooting difficult topics, and practice solving problems. Hence, it is expected that you will prepare before coming to class, reviewing basic background information about the lab and/or relevant content. This will be encouraged through targeted readings and in-class quizzes. The more prepared you are for Zoom-lab, the more fruitful our discussions can be.

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.short>
(<http://www.sciencemag.org/content/323/5910/122.short>)

Lab Schedule

Lab #	Day	Date	Lab Activities	Relevant Lab Manual Sections *If blank, check Canvas for details
WEEK 0				
1	Fri	Sept 24	Wet: Intros, safety, dilutions	How to Use the Manual; Working in the Lab; Keeping a Good Lab Notebook; Safety Rules; Instructions for disposal of laboratory waste; BACKGROUND: Pipette Operation; Liquid Measurement Units, Basic Dilutions, Serial Dilutions; PROTOCOLS: APPENDIX G, C, D
WEEK 1				
2	Wed	Sept 29	Zoom: molecular biology boot camp (review)	APPENDIX H
3	Fri	Oct 1	Wet: Extracting pML104 plasmid, running agarose gel to check extractions	BACKGROUND: Cultures used in the lab; Plasmids used in the lab; Alkaline Lysis Plasmid Purification; Spectrophotometric Analysis of DNA & RNA; Agarose Gel Electrophoresis; PROTOCOLS: 3 (for reference: cultures will be set up ahead of time); Protocols 4, 5, 6 for doing in the lab
WEEK 2				
4	Wed	Oct 6	Zoom: Bioinformatics - Exploring the ADE2 gene to identify important features and where to mutate	BACKGROUND: CRISPR-Cas9 Project Overview ; PROTOCOLS: 1, APPENDIX B
5	Fri	Oct 8	Wet: Restriction enzyme digestion of pML104 plasmid, check digestions with agarose gel electrophoresis, clean digested plasmid for future use in ligation	BACKGROUND: Restriction Enzyme Cloning; PROTOCOLS: 7, 6, 8, 5

WEEK 3				
6	Wed	Oct 13	Zoom: CRISPR experimental design; designing gRNA & HDR template sequences	BACKGROUND: CRISPR-Cas9 Project Overview - editing the ADE2 gene + Homology Directed Repair of ADE2; PROTOCOLS: APPENDIX J; PROTOCOL 2 (2a and 2b).
7	Fri	Oct 15	Wet: Plan & set-up ligations; bacterial transformation with ligations	BACKGROUND: Restriction enzyme cloning; Ligation; Annealed Oligo + Restriction Enzyme Cloning; PROTOCOLS: 9, 10
WEEK 4				
8	Wed	Oct 20	Zoom: Analyze ligation-transformation results	PROTOCOL: 10 (Analyzing E. coli transformations)
9	Fri	Oct 22	Wet: Set-up HDR PCR, check via agarose gels, and clean; re-streak yeast to grow a fresh plate for transformations in week 5; extract pML104-gRNA plasmids and check using agarose gels	BACKGROUND: Polymerase Chain Reaction (PCR); Making Copies of HDR templates; PROTOCOLS: 14, 6, 7, 15 - Part 1
WEEK 5				
10	Wed	Oct 27	Wet: Yeast transformations	PROTOCOLS: 15 - Part 2 through step 7
11	Fri	Oct 29	Wet: Plate yeast transformations; Journal club (DiCarlo et al. 2012 paper)	PROTOCOL: 15 - Part 2, step 8-11; APPENDIX I
WEEK 6				
12	Wed	Nov 3	Zoom: Analyze yeast transformations	
13	Fri	Nov 5	Wet: Extract genomic DNA from yeast cultures, set-up ADE2 PCR	BACKGROUND: Polymerase Chain Reaction (if refresher needed); PROTOCOLS: 16, 17 (step 1 only)

WEEK 7				
14	Wed	Nov 10	**Wet: Run PCRs on agarose gels, clean and send for sequencing	<u>PROTOCOLS</u> : 17 steps 2-4
na	Fri	Nov 12	NO LAB (Veterans Holiday Nov 11)	
WEEK 8				
15	Wed	Nov 17	Zoom: Sequence analysis	<u>BACKGROUND</u> : Sanger DNA sequencing; <u>PROTOCOLS</u> : 18, Part 1 and 2
16	Fri	Nov 19	Wet: Review of overall data set; DNA Extraction & PCR for TAS2R38/PTC project	APPENDIX L, including Protocols 23 & 24
WEEK 9				
17	Wed	Nov 24	Wet: Digestion of TAS2R38 PCRs, PTC taste-test, start analyzing data; Review of CRISPR write-up	APPENDIX L, including Protocols 25-28
na	Fri	Nov 26	No Labs (Thanksgiving)	
WEEK 10				
18	Tues/Wed	Dec 1	Zoom: Working on CRISPR Write-Up/PTC Data	
19	Fri	Dec 3	In-Person Final Exam	

Grading

BIMM101 has multiple grading components:

'Weekly' Review Quizzes	25
Lab notebooks	20
Molecular Biology Review Quiz	2
CRISPR 'Lab' report	25
Final Exam (Or, Technique Report & Presentation, if quarantined)	22

Professionalism	6
Total	100

Weekly quizzes: The 30 minute quizzes will be during some of the in-person labs and are meant to reinforce the concepts we cover in lecture as well the skills you learn in lab. There will be seven quizzes, but you may drop the lowest two grades. **It is very important to follow-up in office hours on concepts you are unclear on.**

Lab notebooks: Each student will be assigned an individual digital lab notebook (Google Doc) that you will use for the quarter. These will be shared with you by your IA and it will be seeded with a template. You can see what we expect in the [following example](#).

Compete 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. Please consult the lab manual for what we expect in the lab notebooks, and see an example entry. **Lab notebook entries will be regularly checked** and scored for various components: pre-lab work which often includes a summaries and predictions, in-lab work such as data analysis and discussion of data, and drawing conclusions in the form of an argument: claims, data to support claims, and explanations in the form of a biological or procedural mechanism, troubleshooting results when necessary.

Molecular Biology Review Quiz: A quiz about some background molecular biology and experimental design concepts. Quizzes will be scored for 1 point for completion, and 1 point for correctness (85% correct gets full correctness points). Instructions to take and submit the quiz will be posted on Canvas.

CRISPR Write-up: Guidelines, rubrics, and due dates for the write-up and assignments will be posted on Canvas. The goal of the write-up is to practice 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) in the form of a short journal article. A draft will be submitted for peer-review, and then a final version. Check course schedule on Canvas for due-dates.

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. This is even more important in the workplace where being unprofessional to colleagues or supervisors will only discount you. When you are discounted, you will not be invited for new opportunities; be very aware and protective of your network.

ONLY IF WE FINISH COURSE ONLINE (Week 10 Technique Report & Presentation:

Toward the end of the course everyone will choose a recombinant DNA/molecular biology technique to research, summarize, and present. The purpose is to explore other techniques that are typically used in molecular biology research, understand how the technique works and can be used, and communicate your understanding in the form of a short-written report and an oral presentation (delivered by video conferencing). Rubrics and guidelines will be posted on the course site.)

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.

Zoom-Lab and In-Person Protocol

Lab attendance is required – Missing a laboratory session without a reasonable excuse (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 course points.

Technical Support

For help with accounts, network, and technical issues:

<https://acms.ucsd.edu/contact/index.html> (<https://acms.ucsd.edu/contact/index.html>)

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

<https://library.ucsd.edu/computing-and-technology/connect-from-off-campus/>
(<https://library.ucsd.edu/computing-and-technology/connect-from-off-campus/>)

Academic integrity (<https://students.ucsd.edu/academics/academic-integrity/index.html>
(<https://students.ucsd.edu/academics/academic-integrity/index.html>)

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:

858-534-4382 (<http://disabilities.ucsd.edu>) | <http://disabilities.ucsd.edu>
(<http://disabilities.ucsd.edu>) | osd@ucsd.edu (<mailto:osd@ucsd.edu>) |

Office of Equity, Diversity, and Inclusion:

858.822.3542 | diversity@ucsd.edu (<mailto:diversity@ucsd.edu>) | <https://diversity.ucsd.edu/>
(<https://diversity.ucsd.edu/>)

<https://students.ucsd.edu/student-life/diversity/index.html>

(<https://students.ucsd.edu/student-life/diversity/index.html>)

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/> (<https://ophd.ucsd.edu/>), or <http://ophd.ucsd.edu/report-bias/index.html> (<http://ophd.ucsd.edu/report-bias/index.html>).






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
[\(<mailto:sarc@ucsd.edu>\)](mailto:sarc@ucsd.edu) | <https://care.ucsd.edu> (<https://care.ucsd.edu>)









Counseling and Psychological Services (CAPS): 858.534.3755 | <https://caps.ucsd.edu>
[\(<https://caps.ucsd.edu>\)](https://caps.ucsd.edu)

Course Summary:










Date	Details	Due
Sun Sep 26, 2021	 About You (https://canvas.ucsd.edu/courses/29383/assignments/360547)	due by 11:59pm
Tue Sep 28, 2021	 Mol Bio Review (https://canvas.ucsd.edu/courses/29383/assignments/360555)	due by 11:59pm
Wed Sep 29, 2021	 Lab C01 (Christina) (https://canvas.ucsd.edu/calendar?event_id=576630&include_contexts=course_29383)	8:30am to 10:30am
	 Lab C02 (Casey) - 10:20am to 12:20pm (https://canvas.ucsd.edu/calendar?event_id=575217&include_contexts=course_29383)	10am to 1pm
	 Lab C03 (Terry): 1:00-3:00PM (https://canvas.ucsd.edu/calendar?event_id=576553&include_contexts=course_29383)	1pm to 3pm
	 Lab C04 (Jeffrey) (https://canvas.ucsd.edu/calendar?event_id=576641&include_contexts=course_29383)	2:30pm to 5:30pm

Date	Details	Due
Fri Oct 1, 2021	 Weekly Quiz 1 https://canvas.ucsd.edu/courses/29383/assignments/388061	due by 11:59pm
	 Lab C01 (Christina) https://canvas.ucsd.edu/calendar?event_id=576631&include_contexts=course_29383	8:30am to 10:30am
	 Lab C02 (Casey) - 10:20am to 12:20pm https://canvas.ucsd.edu/calendar?event_id=575218&include_contexts=course_29383	10am to 1pm
Wed Oct 6, 2021	 Lab C03 (Terry): 1:00-3:00PM https://canvas.ucsd.edu/calendar?event_id=576554&include_contexts=course_29383	1pm to 3pm
	 Lab C04 (Jeffrey) https://canvas.ucsd.edu/calendar?event_id=576642&include_contexts=course_29383	2:30pm to 5:30pm
Thu Oct 7, 2021	 BIMM 101 - Dr Day Office Hours https://canvas.ucsd.edu/calendar?event_id=585382&include_contexts=course_29383	11am to 12pm
Fri Oct 8, 2021	 Weekly Quiz 2 https://canvas.ucsd.edu/courses/29383/assignments/388082	due by 11:59pm
Wed Oct 13, 2021	 Lab C01 (Christina) https://canvas.ucsd.edu/calendar?event_id=576632&include_contexts=course_29383	8:30am to 10:30am
	 Lab C02 (Casey) - 10:20am to 12:20pm https://canvas.ucsd.edu/calendar?event_id=575219&include_contexts=course_29383	10am to 1pm

Date	Details	Due
	 Lab C03 (Terry): 1:00-3:00PM https://canvas.ucsd.edu/calendar?event_id=576555&include_contexts=course_29383	1pm to 3pm
	 Lab C04 (Jeffrey) https://canvas.ucsd.edu/calendar?event_id=576643&include_contexts=course_29383	2:30pm to 5:30pm
Thu Oct 14, 2021	 BIMM 101 - Dr Day Office Hours https://canvas.ucsd.edu/calendar?event_id=585383&include_contexts=course_29383	11am to 12pm
Fri Oct 15, 2021	 Weekly Quiz 3 https://canvas.ucsd.edu/courses/29383/assignments/388081	due by 11:59pm
	 Lab C01 (Christina) https://canvas.ucsd.edu/calendar?event_id=576633&include_contexts=course_29383	8:30am to 10:30am
	 Lab C02 (Casey) - 10:20am to 12:20pm https://canvas.ucsd.edu/calendar?event_id=575220&include_contexts=course_29383	10am to 1pm
Wed Oct 20, 2021	 Lab C03 (Terry): 1:00-3:00PM https://canvas.ucsd.edu/calendar?event_id=576556&include_contexts=course_29383	1pm to 3pm
	 Lab C04 (Jeffrey) https://canvas.ucsd.edu/calendar?event_id=576644&include_contexts=course_29383	2:30pm to 5:30pm
Thu Oct 21, 2021	 BIMM 101 - Dr Day Office Hours https://canvas.ucsd.edu/calendar?event_id=585384&include_contexts=course_29383	11am to 12pm

Date	Details	Due
Fri Oct 22, 2021	 <u>Weekly Quiz 4</u> .https://canvas.ucsd.edu/courses/29383/assignments/388080	due by 11:59pm
Thu Oct 28, 2021	 <u>BIMM 101 - Dr Day Office Hours</u> .https://canvas.ucsd.edu/calendar?event_id=585385&include_contexts=course_29383	11am to 12pm
Fri Oct 29, 2021	 <u>Weekly Quiz 5</u> .https://canvas.ucsd.edu/courses/29383/assignments/388079	due by 11:59pm
Wed Nov 3, 2021	 <u>Lab C01 (Christina)</u> .https://canvas.ucsd.edu/calendar?event_id=576635&include_contexts=course_29383	8:30am to 10:30am
	 <u>Lab C02 (Casey) - 10:20am to 12:20pm</u> .https://canvas.ucsd.edu/calendar?event_id=575221&include_contexts=course_29383	10am to 1pm
	 <u>Lab C03 (Terry): 1:00-3:00PM</u> .https://canvas.ucsd.edu/calendar?event_id=576558&include_contexts=course_29383	1pm to 3pm
	 <u>Lab C04 (Jeffrey)</u> .https://canvas.ucsd.edu/calendar?event_id=576646&include_contexts=course_29383	2:30pm to 5:30pm
Thu Nov 4, 2021	 <u>BIMM 101 - Dr Day Office Hours</u> .https://canvas.ucsd.edu/calendar?event_id=585386&include_contexts=course_29383	11am to 12pm
Fri Nov 5, 2021	 <u>Weekly Quiz 6</u> .https://canvas.ucsd.edu/courses/29383/assignments/388078	due by 11:59pm

Date	Details	Due
Thu Nov 11, 2021	 <u>BIMM 101 - Dr Day Office Hours</u> https://canvas.ucsd.edu/calendar?event_id=585387&include_contexts=course_29383	11am to 12pm
	 <u>Lab C01 (Christina)</u> https://canvas.ucsd.edu/calendar?event_id=576637&include_contexts=course_29383	8:30am to 10:30am
	 <u>Lab C02 (Casey) - 10:20am to 12:20pm</u> https://canvas.ucsd.edu/calendar?event_id=575222&include_contexts=course_29383	10am to 1pm
Wed Nov 17, 2021	 <u>Lab C03 (Terry): 1:00-3:00PM</u> https://canvas.ucsd.edu/calendar?event_id=576560&include_contexts=course_29383	1pm to 3pm
	 <u>Lab C04 (Jeffrey)</u> https://canvas.ucsd.edu/calendar?event_id=576648&include_contexts=course_29383	2:30pm to 5:30pm
Thu Nov 18, 2021	 <u>BIMM 101 - Dr Day Office Hours</u> https://canvas.ucsd.edu/calendar?event_id=585388&include_contexts=course_29383	11am to 12pm
Fri Nov 19, 2021	 <u>Weekly Quiz 7</u> https://canvas.ucsd.edu/courses/29383/assignments/388077	due by 11:59pm
Mon Nov 22, 2021	 <u>CRISPR Lab Report Draft 1</u> https://canvas.ucsd.edu/courses/29383/assignments/360549	due by 11:59pm
Wed Dec 1, 2021	 <u>Lab C01 (Christina)</u> https://canvas.ucsd.edu/calendar?event_id=576639&include_contexts=course_29383	8:30am to 10:30am

Date	Details	Due
	 Lab C02 (Casey) - 10:20am to 12:20pm https://canvas.ucsd.edu/calendar?event_id=575223&include_contexts=course_29383	10am to 1pm
	 Lab C03 (Terry): 1:00-3:00PM https://canvas.ucsd.edu/calendar?event_id=576562&include_contexts=course_29383	1pm to 3pm
	 Lab C04 (Jeffrey) https://canvas.ucsd.edu/calendar?event_id=576650&include_contexts=course_29383	2:30pm to 5:30pm
Thu Dec 2, 2021	 BIMM 101 - Dr Day Office Hours https://canvas.ucsd.edu/calendar?event_id=585390&include_contexts=course_29383	11am to 12pm
Fri Dec 3, 2021	 Final https://canvas.ucsd.edu/courses/29383/assignments/388060	due by 11:59pm
Sat Dec 4, 2021	 CRISPR Lab Final Report https://canvas.ucsd.edu/courses/29383/assignments/360548	due by 11:59pm
	 Lab Notebook https://canvas.ucsd.edu/courses/29383/assignments/360554	
	 Professionalism https://canvas.ucsd.edu/courses/29383/assignments/360556	
	 to normalize lab reports https://canvas.ucsd.edu/courses/29383/assignments/360557	