

Instructor:

Dr. Lisa McDonnell (she/her) lmcdonnell@ucsd.edu

I will only send and receive correspondence via my UCSD email address or the course Canvas site.

Office Hours: Wednesdays & Fridays, 10am-10:50am (PST). Zoom link on Canvas. Also time to talk in lab.

It is especially important to come to office hours to ask questions and get clarification! It can be scary, admitting confusion – but I have the utmost respect for people who can muster the courage to ask questions. Being proactive to ask questions during office hours will be critical for success, especially given the online nature of the course. Please feel welcome to come to office hours to talk about course material, or other topics (e.g., your other academics, career goals (or confusions!), hobbies, etc.!).

Instructional assistants:

B01 Michelle Zhang mhz003@ucsd.edu

B02 Blaine Safir bsafir@ucsd.edu

Course site: <https://canvas.ucsd.edu/>

Course structure:

Class

- Video lectures: introduce important concepts and procedures relevant to lab and course tasks
 - Lecture quizzes: on Canvas to reinforce some key concepts/skills, due before relevant lab session
- Lectures are recorded. I encourage you to office hours to review material and ask questions.*

Lab

Digital lab notebooks will be assigned to you, this is where your work will go before and during each lab session.

- **Before:** Draw protocol for the day to visualize lab tasks and goals. Insert this drawing into lab notebook, and summarize goals.
- **During:** Engage with peers, IA, and Instructor in small group discussions via Zoom to analyze data, design experiments, discuss results.
- Ask IA and instructor questions.
- **By end of lab day:** Complete Lab Tasks in lab notebook. This typically includes questions about the results/data analyzed, drawing conclusions, troubleshooting unexpected results.

Other tasks

- Practice applying knowledge and skills via take-home tests, writing, and presenting

Class: **Wed March 31 is a live Zoom session @9:30am, Zoom link on Canvas.** All other class sessions are pre-recorded videos, posted in the weekly modules on Canvas.

Laboratory sessions: Live sessions, Wednesdays and Fridays, 11:00am – 2:00pm (PST), Zoom links on Canvas.

ZOOM PASSWORD: BIMM101

Course Schedule: Link [here \(and this link is on Canvas\)](#). Updates will be posted on Canvas.

Materials needed: Be able to connect to lab Zoom sessions. Lab Manual will be provided as PDF on Canvas, and you will also be assigned a Google Doc to use as a laboratory (research) notebook.

Welcome to BIMM 101: Recombinant DNA Laboratory! In BIMM101 we aim to function as an inclusive learning community to develop an understanding of research in molecular biology through experimental design, critical analysis of data and literature, and experimentation.

BROAD LEARNING GOALS

- Apply knowledge of molecular biology concepts and lab techniques to plan experiments, explain and troubleshoot results
- Explain the importance of proper controls in designing experiments and interpreting results
- Perform basic lab math skills, statistical analysis, and graphing
- Draw conclusions based on evidence and reasoning
- Use basic bioinformatics databases and applications
- Find, read, and evaluate primary literature
- Critically evaluate scientific writing (your own, and that of peers)
- Collaborate with one another to learn foundation biological concepts and laboratory skills

MAJOR COMPONENTS

- Video lectures: Learn biological concepts and research techniques related to our experimental context
- Laboratory: Engage in collaboration to learn, perform analysis, and troubleshoot
- Out-of-class: Consolidate understanding with readings, pre-lab planning, online quizzes, assignments, take-home tests

ACCESSIBILITY

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

Any student with a disability is welcome to contact me early in the quarter to work out accommodations to support their success in this course. Students requesting accommodations for this course due to a disability should work through the Office for Students with Disabilities (OSD). Instructors will receive Authorization for Accommodations Letters from the OSD online portal. Whenever possible, we will use universal designs that are inclusive. If you have feedback on how to make the class more accessible, please get in touch!

INCLUSION

It is our goal to create a learning environment that supports diversity of thought, perspective, experience, and identities. We encourage all of you to participate in discussion and contribute to the field from your perspective. If you have feedback on how to make the class more inclusive, please get in touch!

Office of Equity, Diversity, and Inclusion:

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

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

<https://regents.universityofcalifornia.edu/governance/policies/4400.html>

LEARNING IN THIS COURSE

This course is designed to be an environment for everyone to learn and construct a shared understanding of the material. **Active participation** by engaging with the lecture material, asking and answering questions (e.g., during office hours and in lab), and contributing in a meaningful way to discussions during lab session is expected. Being able to communicate understanding, and confusion, is critical to success in any discipline, and is very useful for learning¹. To encourage collaboration, lab discussions will be done in groups, and grades will not be assigned on a curve.

Instead of memorization, we will focus on developing an understanding of fundamental concepts as they apply to different examples. Therefore, tests will include questions that are based on solving problems in new contexts, analyzing and interpreting data to draw conclusions, and critiquing claims.

1 Smith et al., 2009. <http://www.sciencemag.org/content/323/5910/122.short>

GRADING

BIMM101 has multiple grading components:

Lecture quizzes	5
Lab notebooks	10
Molecular Biology Review	2
Take-home tests	22
Mini write-up*	10
CRISPR write-up*	22
At home experiment**	3
Technique Report & Presentation	15
Professionalism	3
Extra credit (e.g., surveys)	0.5

*A small portion of this grade will be for giving quality feedback on your peer's writing.

**If you are unable to receive a kit we will come up with an alternative assignment.

Because different people may excel in different aspects, the take-home tests or the CRISPR write-up will be scaled to 30%, depending on what benefits each individual student, bringing the total to 100 points (extra credit will be added to the total possible 100).

The following grading scheme will be used. The course is **not** graded on a curve (i.e. 20% of students getting A, B, C, and such). Thus, the ability to do well in this course is not dependent on others doing poorly.

95-100	A+	71-74	C+
91-94	A	67-80	C
87-90	A-	63-66	C-
83-86	B+	55-62	D
79-82	B	0-54	F
75-78	B-		

Lecture quizzes: The quizzes posted on Canvas are meant to reinforce important concepts covered in the video lectures. Quizzes are to be completed *prior* to the start of the relevant lab (deadlines will be posted on Canvas) to encourage coming to lab with relevant background knowledge.

Because mastery is not necessarily expected after watching the video lecture, an average score from all lecture quizzes of 85% or higher will result in full points (adjusted at the end of the quarter). **Please follow-up on things you are confused about! Ask questions in class or lab, come to office hours!**

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 (Week 1). 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. Please consult the lab notebook guidelines and rubric, which includes a link to an example notebook. **Lab notebook entries will be regularly and randomly 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, drawing conclusions supporting by reasoning and including a biological or procedural mechanism/explanation, troubleshooting results when necessary. In total, about 5 entries will be checked and scored.

Molecular Biology Review Assignment: An assignment with questions to review some background molecular biology and experimental design concepts will be due before the start of lab on Friday Oct 9. This assignment will be scored 1 point for on-time completion, and 1 point for correctness. Instructions to submit the assignment will be posted on Canvas.

Take-home tests: Tests will be released on Canvas and you will have three days to work on them (see class schedule). You will be asked to up your completed testes to GradeScope and Turnitin (instructions provided on Canvas). Tests will be cumulative but will focus on the most recent material. The highest scoring test will be worth 9% and the highest worth 13%.

Mini write-up: This assignment is a chance to practice writing about results. Instructions will be provided in class and on Canvas.

CRISPR Write-up: 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. Consult course schedule for due dates.

At home experiment: An assignment to describe the work and outcomes of the at-home experiment will be due with your CRISPR write-up. If you were unable to receive a kit we will come up with an alternative assignment.

Technique Report & Presentation: At the end of the course everyone will work with a partner to choose a recombinant DNA/molecular biology technique to research, summarize, and present. Presentation partners will be randomly assigned. The purpose is to explore other techniques that are typically used in molecular biology research, understand how the technique works and can be used, explore an example of the technique used in research, and communicate your understanding in the form of a short-written report

and an oral presentation (delivered by video conferencing during lab time). Rubrics and guidelines will be posted on the course site.

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 professionalism. **The bulk of your professionalism score will come from participation in lab sessions. Please get in touch immediately if you anticipate issues participating in lab sessions.**

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 video 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
- Ignoring the directions or requests from the instructional team

Extra Credit: The 0.5% extra credit can be earned by completing course evaluations and related surveys which aim to improve the course and the educational experiences of your future peers. There are no other opportunities for extra credit beyond what is assigned by the course instructor.

LATE ASSIGNMENTS AND QUIZZES

Assignments must be submitted on time to be eligible for full credit. Late assignments may be subject to a 10% penalty per day, to a maximum of 2 days late. Please get in touch immediately if you anticipate challenges completing work on time.

REGRADES

If a grading error has been made, you should submit a re-grade request to your Instructional Assistant or

Dr. McDonnell. Students who submit items for re-grading understand that we may re-grade the entire item and the score may go up or down.

ACADEMIC INTEGRITY

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

Integrity of scholarship is essential for an academic community. The University expects that both students and faculty 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. In this course, we need to establish a set of shared values. Following are values* adopted from the [International Center for Academic Integrity](#), which serve as the foundation for academic integrity.

	As students we will.....	As the teaching team we will.....
Honesty	<ul style="list-style-type: none"> Honestly demonstrate your knowledge and abilities according to expectations listed in the syllabus or in relation to specific assignments and exams Communicate openly without using deception, including citing appropriate sources 	<ul style="list-style-type: none"> Give you honest feedback on your demonstration of knowledge and abilities on assignments and exams Communicate openly and honestly about the expectations and standards of the course through the syllabus and in relation to assignments and exams
Responsibility	<ul style="list-style-type: none"> Complete assignments on time and in full preparation for class Show up to class on time and be mentally and physically present Participate fully and contribute to team learning and activities 	<ul style="list-style-type: none"> Give you timely feedback on your assignments and exams Show up to class on time and be mentally and physically present Create relevant assessments and class activities
Respect	<ul style="list-style-type: none"> Speak openly with one another while respecting diverse viewpoints and perspectives Provide sufficient space for others to voice their ideas 	<ul style="list-style-type: none"> Respect your perspectives even while we challenge you to think more deeply and critically Help facilitate respectful exchange of ideas
Fairness	<ul style="list-style-type: none"> Contribute fully and equally to collaborative work, so that we are not freeloading off of others on our teams Not seek unfair advantage over fellow students in the course 	<ul style="list-style-type: none"> Create fair assignments and exams and grade them in a fair and timely manner Treat all students and collaborative teams equally
Trustworthiness	<ul style="list-style-type: none"> Not engage in personal affairs while on class time Be open and transparent about what we are doing in class Not distribute course materials to others in an unauthorized fashion 	<ul style="list-style-type: none"> Be available to all students when we say we will be Follow through on our promises Not modify the expectations or standards without communicating with everyone in the course
Courage	<ul style="list-style-type: none"> Say or do something when we see actions that undermine any of the above values Accept the consequences of upholding and protecting the above values 	<ul style="list-style-type: none"> Say or do something when we see actions that undermine any of the above values Accept the consequences of upholding and protecting the above values

* This class statement of values is adapted with permission from Tricia Bertram Gallant Ph.D.

All course materials are the property of the instructor, the course, and the University of California, San Diego and **may not** be posted online, submitted to private or public repositories, or distributed to

unauthorized people outside of the course. Any suspected instances of a breach of academic integrity will be reported to the Academic Integrity Office for review and possibly given a score of 0.

Student Resources for Support and Learning

ACADEMIC SUPPORT

Geisel Library	Research tools and eReserves
Content Tutoring with the Teaching + Learning Commons	Drop-in and online tutoring through the Academic Achievement Hub
Supplemental Instruction with the Teaching + Learning Commons	Peer-assisted study sessions through the Academic Achievement Hub to improve success in historically challenging courses
Writing Hub Services in the Teaching + Learning Commons	Improve writing skills and connect with a peer writing mentor
Learning Strategies Tutoring	Address learning challenges with a metacognitive approach
OASIS	Intellectual and personal development support
Student Success Coaching Program	Peer mentor program that provides students with information, resources, and support in meeting their goals
Academic Integrity	Policy on Academic Integrity of Scholarship and strategies to excel with integrity
Technical Support	Assistance with accounts, network, and technical issues

STUDENT RESOURCES

Basic Needs	Provides access to food, housing, and financial resources
Counseling and Psychological Services (CAPS)	Provides services like confidential counseling and consultations for psychiatric services and mental health programming

Community Centers	As part of the Office of Equity, Diversity, and Inclusion the campus community centers provide programs and resources for students and contribute toward the evolution of a socially just campus
Counseling and Psychological Services	Individual, group, couples, and family psychotherapy services for registered undergraduate and graduate students
Office for Students with Disabilities	Documents students disabilities, provides accessibility resources, and reasonable accommodations
Triton Concern Line	Report students of concern at (858) 246-1111

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/>, or <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 | <https://care.ucsd.edu>
Counseling and Psychological Services (CAPS): 858.534.3755 | <https://caps.ucsd.edu>

CHILDREN “IN” LAB

You are welcome to have children with you during video sessions as I fully understand that childcare situations may be complicated for many of us at this time. Do your best to participate and engage, but also please get in touch with me if you have any questions or concerns.

LETTERS OF RECOMMENDATION

If you think you may want me to write you a letter of recommendation (or any other instructor), please consider what a good letter would contain and how your actions in the course demonstrate the qualities you will want highlighted in a good letter. When students ask me for a letter of recommendation, I ask them to write to me about how they demonstrated critical thinking, leadership, collaboration, and professionalism. I will be specifically looking for examples of these qualities *that I could have noticed* during lab and office hours. Be sure to actively participate in the discussions, talk to me during the lab and my office hours: ask questions, offer your own ideas and interpretations of your results, bring interesting facts/papers that are connected to the material we are studying. If you don't actively show the qualities that are needed to write a good letter, it will be hard for me to write a letter that is meaningful and useful.

SUBJECT TO CHANGE POLICY

The information contained in the course syllabus, other than the grade and absence policies, may be – under certain circumstances (e.g. to enhance student learning) – subject to change with reasonable advance notice, as deemed appropriate by the instructor.

TECHNICAL SUPPORT

For help with accounts, network, and technical issues: <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/>

Consent to Participate in Educational Research

University of California, San Diego

Consent to Act as a Research Subject

Investigating the Impact of Pedagogical Choices on University Student Learning and Engagement

Who is conducting the study, why you have been asked to participate, how you were selected, and what is the approximate number of participants in the study?

Gabriele Wienhausen, Director of the Teaching and Learning Commons, together with her education research colleagues is conducting a research study to find out more about how pedagogical choices affect student learning and experience in the classroom. You have been asked to participate in this study because you are a student in a class that is being studied or used as a control. There will be approximately 500,000 participants in this study.

Why is this study being done?

The purpose of this study is to create knowledge that has the potential to improve the learning and educational experience of students at UC San Diego and beyond.

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What will happen to you in this study and which procedures are standard of care and which are experimental?

If you agree to be in this study, the following will happen:

- Your data from this class including grades, homework and exam submissions, and survey responses will be included in the analysis to determine the effectiveness of the pedagogical techniques used in this course compared to other similar courses.

How much time will each study procedure take, what is your total time commitment, and how long will the study last?

Your participation involves only agreeing to let us use your data in our analysis. It will require no time on your part above the time you put into this course without agreeing to the study.

What risks are associated with this study?

Participation in this study may involve some added risks or discomforts. These include the following:

1. A potential for the loss of confidentiality. We will not share your personally identifying data with people outside our research team. Data will only be kept in anonymized form for research purposes. Course data will not be used for this research study until after final grades have been posted and will be rendered confidential by removing any identifiers before analysis. Your instructor will not know whether or not you are participating in this study until after final grades have been posted. Data from students who opt out of the study will be removed prior to data analysis. Research records will be kept confidential to the extent allowed by law. Research records may be reviewed by the UCSD Institutional Review Board.

Since this is an investigational study, there may be some unknown risks that are currently unforeseeable. You will be informed of any significant new findings.

What are the alternatives to participating in this study?

The alternatives to participation in this study are not to participate. If you choose to opt-out of participating in this research study, we will exclude your data from analysis. Whether you participate will have no impact on your experience or grade in the associated class as the professor will not know who is or is not participating in the study until after final grades are assigned.

What benefits can be reasonably expected?

There is no direct benefit to you for participating in the study. The investigator, however, may learn more about how to improve student learning, and society may benefit from this knowledge.

Can you choose to not participate or withdraw from the study without penalty or loss of benefits?

Participation in research is entirely voluntary. You may refuse to participate or withdraw or refuse to answer specific questions in an interview or on a questionnaire at any time without penalty or loss of benefits to which you are entitled. If you decide that you no longer wish to continue in this study before the end of the quarter, simply respond to the online opt-out form here:

<https://goo.gl/forms/JSBRjEmkES6W6xYc2>. If you decide to opt out after the quarter has ended, you must contact Ying Xiong (yix184@ucsd.edu) and give the quarter and the course from which you would like your data withdrawn.

You will be told if any important new information is found during the course of this study that may affect your wanting to continue.

Can you be withdrawn from the study without your consent?

The PI may remove you from the study without your consent if the PI feels it is in your best interest or the best interest of the study. You may also be withdrawn from the study if you do not follow the instructions given you by the study personnel.

Will you be compensated for participating in this study?

You will not be compensated for participating in this study.

Are there any costs associated with participating in this study?

There will be no cost to you for participating in this study.

Who can you call if you have questions?

Gabriele Wienhausen and/or her colleague has explained this study to you and answered your questions. If you have other questions or research-related problems, you may reach Gabriele Wienhausen at gwienhausen@ucsd.edu or (858) 534-3958.

You may call the Human Research Protections Program Office at 858-246-HRPP (858-246-4777) to inquire about your rights as a research subject or to report research-related problems.

Your Consent

If you consent to participate in this study and are at least 18 years old, no action is needed. If you DO NOT consent to participate in this study, or you choose to opt-out at any time during the quarter, please submit this form online at <https://goo.gl/forms/JSBRjEmkES6W6xYc2>. Your instructor will not have access to the list of students who opted out until after grades are posted. Note that you must separately opt-out of the study for each course involved in this study.