MCELLBI N184 Course Syllabus Summer 2022

Intro to CRISPR: From Basic Biology to Genome Editing Technology

This course will address topics in genome editing and CRISPR-Cas9 research, including basic and enhanced CRISPR methods, cellular repair mechanisms, regulation of gene expression, uses for editing in various organisms, and bioethics. Students will learn from a collection of local experts about ongoing campus research and gain the background knowledge to understand current publications and applications of genome editing.

Course Leaders:

The course instructor and GSI will offer virtual office hours for real time discussions via Zoom. These office hours allow for synchronous interaction with the instructor and GSI and are a good opportunity to discuss your questions relevant to the course.

Ross Wilson *Faculty*	rosswilson@berkeley.edu	TBD, will be announced on bCourses
Connor Tsuchida *Graduate Student Instructor (GSI)*	connortsuchida@berkeley.edu	TBD, will be announced on bCourses

*Please direct any logistics or grading questions to Connor, who will confer with the other course leaders as needed.

Schedule:

July 25 – August 11 1:00–1:59 pm Pacific Time
Monday – Thursday

Recorded lectures will be made available to all students. If you are ill or have an unplanned absence, please review the recording and speak with a GSI or another student to make sure you understand the material that you missed.

Quizzes and Grading:

This is a pass/no pass (P/NP) course. Your grade will be based on the results of 2 weekly quizzes (50%) and 1 final quiz (50%). You need a 50% total score or higher to pass. The final quiz (course is only 3 weeks long) will be cumulative. The quizzes will rely on synthesis and critical understanding of materials presented in the course, using short answer questions rather than fact or memorization based assessments.

You'll get access to each quiz just after the week's last lecture (each Thursday), at 2 pm Pacific Time. You'll have until just before the next week's Monday, at 1 pm Pacific Time, to complete and submit the quiz.

Note that if you are not in the Pacific Time Zone, you will have to calculate the quiz deadline in your local time zone. Late quizzes will not be permitted due to time confusion. Submitting a late quiz will automatically reduce your score by half.

Cheating and plagiarism

If you are found cheating or copying material from the web, you will get an automatic 0 on the quiz and it may be reported to the University for review. Cheating is not tolerated. It is VERY obvious when you are copying and pasting content that you did not write yourself. If you're having trouble writing about science, that's understandable, just do your best! If it's a real issue, please reach out to our GSI for tips. Do not plagiarize.

Course Resources and Communications:

We will use bCourses for course-related announcements, quizzes, resource sharing, and optional discussions. You are responsible for checking bCourses and staying up to date on any course news.

Disabilities

If you need disability-related accommodations in this class, if you have emergency medical information you wish to share with us, or if you need special arrangements in case the building must be evacuated, please inform the instructor immediately. Students who need academic accommodations (for example, a notetaker), should request them from the Disabled Students' Program. 260 César Chávez Center, 642-0518 (voice or TTY). DSP is the campus office responsible for verifying disability- related need for academic accommodations, assessing that need, and for planning accommodations in cooperation with students and instructors as needed and consistent with course requirements.

Safety, Support, and Inclusion:

We hope you will have a wonderful experience during this course, and we've made an effort to bring in a diverse array of speakers, but please don't hesitate to let us know if have any issues related to the class, its leaders, or its speakers. You will also have the opportunity to provide course feedback as part of the final quiz.

Although faculty and staff can act as excellent resources for students, you should be aware that we are legally *required* to report any violations of campus policy. We have compiled a variety of support resources on the IGI website, including topics like mental health, discrimination, harassment, and support for specific populations like student-parents, undocumented students, and others. Visit tinyurl.com/igi-support and click the "Student Resources" drop-down under "UC Berkeley."

Speakers:

Week	Day	Topic	Speaker
1	**Monday** July 25	Intro to CRISPR	TBD
	Tuesday July 26	CRISPR Immunity	TBD
	Wednesday July 27	Structure and Function of Cas9	TBD
	Thursday July 28	Genome Editing and DNA Repair	TBD
2	**Monday** August 1	CRISPR Applications: Basic Research	TBD
	Tuesday August 2	CRISPR Applications: Plants	TBD
	Wednesday August 3	CRISPR Applications: The CRISPR Toolbox	TBD
	Thursday August 4	CRISPR Applications: Human Therapeutics	TBD
3	**Monday** August 8	CRISPR Diagnostics	TBD
	Tuesday August 9	CRISPR Policy	TBD
	Wednesday August 10	CRISPR Ethics	TBD
	Thursday August 11	Final Synthesis and Discussion	Connor Tsuchida

Reading Assignment Examples:

Wright, A., Nuñez, J. and Doudna, J. (2016). Biology and Applications of CRISPR Systems: Harnessing Nature's Toolbox for Genome Engineering. *Cell*, 164(1-2), pp.29-44.

Barrangou, R., Fremaux, C., Deveau, H., Richards, M., Boyaval, P., Moineau, S., Romero, D. and Horvath, P. (2007). CRISPR Provides Acquired Resistance Against Viruses in Prokaryotes. *Science*, 315(5819), pp.1709- 1712.

Amitai, G. and Sorek, R. (2016). CRISPR–Cas adaptation: insights into the mechanism of action. *Nature Reviews Microbiology*, 14(2), pp.67-76.

Hille, F., Richter, H., Wong, S., Bratovič, M., Ressel, S. and Charpentier, E. (2018). The Biology of CRISPR- Cas: Backward and Forward. *Cell*, 172(6), pp.1239-1259.