

MCB 38: Stem Cell Biology, Ethics and Societal Impact Spring 2021

Lectures: MWF 9-10am, see Zoom link on bCourses

Instructors

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Graduate Student Instructors (GSI)

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All office hours will be announced in class and on bCourses

Course description

What are stem cells? How do they function normally in the body and how can we harness their potential for treating diseases? What are the biological, ethical and political barriers to genetically engineering stem cells for use in regenerative medicine? To address these questions, we will start with the fundamentals necessary to understand stem cell biology. We will explore how stem cell technologies can be advanced and used in novel medical therapies, with a particular focus on innovations for manipulating and engineering stem cells. Integral to these topics will be a thorough dialog of ethical implications and the controversies surrounding stem cell research.

Discussion sections

There are discussion sections once a week. Zoom links for section will be available on bCourses. Discussion sections will not be recorded.

Attendance in discussion sections is **highly recommended**. Please attend the section you are enrolled in. You will go over lecture material, discuss the reading assignments and have more in-depth discussions about the ethics and controversies related to stem cell research. There will be an assignment or activity for each section which will count towards your overall grade in the class. If you are unable to attend discussion section because you are in a much different time zone, then please contact your GSI for an alternative weekly assignment.

Section	Day/time	GSI
101	F 11am	Nasima
102	F 12pm	Rebecca
103	F 1pm	Rebecca
104	F 2pm	Nasima

Reading material

There is no textbook for this course. We will post short articles to read on bCourses throughout the semester. Some of these articles will have assignments associated with them due either in discussion section or on bCourses. Your GSI will keep you informed about reading assignments.

Course web site

<https://bcourses.berkeley.edu/> or find it via CalCentral.

We will post lecture notes and other supplemental material in the “Files” section of bCourses. You should check the course web site for announcements or have them automatically emailed to you. It is up to you to check bCourses regularly.

Grades

Discussion section assignments: 10%

Homework assignments: 10%

2 Midterms: $2 \times 25\% = 50\%$

Final: 30%

Grades will not be curved, so you are not in competition with each other.

Discussion section assignments: In discussion section you will complete activities with other students in order to receive credit for attendance and participation. If you cannot regularly attend discussion section because you are in a different time zone, please contact your GSI for an alternative weekly assignment. Your lowest two discussion section assignments will be dropped (so you can miss two sections without it affecting your grade).

Homework assignments: There will be short weekly assignments for some of the articles you will read. Assignments are available on bCourses on Fridays and will be due the following Thursday at 11:59pm. You will get two attempts for the homework before the due date. Your lowest two homework assignments will be dropped (so you can miss two homework assignments without it affecting your grade).

Exams: There will be two midterm exams that you will take on Gradescope (which you can get to using bCourses). The exam will be available for 24 hours on the day indicated below, but once you start the exam you will have 90 minutes to complete it. The exams will be a combination of multiple choice, short answer questions and short essay questions (you won't have to write more than 4-5 sentences).

Midterm 1 (covers Lec 1-11) is on Friday February 19

Midterm 2 (covers Lec 12-24) is on Friday April 2

The final exam is cumulative and takes place Monday May 10. It will be available for 24 hours and you will have 3 hours to complete it.

All the exams will be open-note, but you will not have enough time to look up all the information, so you should study for the exam as you would for an in-class exam. You are not allowed to discuss the exam with other students or work together on the exam. We expect you to complete your own work!

Course Policies

Safe, Supportive, and Inclusive Environment:

Whenever a faculty member, staff member, post-doc, or GSI is responsible for the supervision of a student, a personal relationship between them of a romantic or sexual nature, even if consensual, is against university policy. Any such relationship jeopardizes the integrity of the educational process.

Although faculty and staff can act as excellent resources for students, you should be aware that they are required to report any violations of this campus policy. If you wish to have a confidential discussion on matters related to this policy, you may contact the Confidential Care Advocates on campus for support related to counseling or sensitive issues. Appointments can be made by calling (510) 642-1988.

The classroom, lab, and work place should be safe and inclusive environments for everyone. The Office for the Prevention of Harassment and Discrimination (OPHD) is responsible for ensuring the University provides an environment for faculty, staff and students that is free from discrimination and harassment on the basis of categories including race, color, national origin, age, sex, gender, gender identity, and sexual orientation. Questions or concerns? Call (510) 643-7985, email ask_ophd@berkeley.edu, or go to <http://survivorsupport.berkeley.edu/>.

Diversity statement

The University of California considers the diversity of its students, faculty, and staff to be a strength and critical to its educational mission. Our community is enriched and enhanced by diversity along a number of dimensions, including race, ethnicity, national origins, gender, sexuality, class and religion. We welcome all our students in our class and hope that you always feel included. If there are aspects of the instruction within this course that result in barriers to your inclusion, please let us know. Your suggestions are encouraged and appreciated.

Mental Health and Wellness

All students – regardless of background or identity – may experience a range of issues that can become barriers to learning. These issues include, but are not limited to, strained relationships, anxiety, depression, alcohol and other drug problems, difficulties with concentration, sleep, and eating, and/or lack of motivation. Such mental health concerns can diminish both academic performance and the capacity to participate in daily activities.

In the event that you need mental health support, or are concerned about a friend, UC Berkeley offers many services, such as free short-term counseling at University Health Services. A list of resources can be found here: <https://uhs.berkeley.edu/sites/default/files/mhresources.pdf>
A campus website having links to many resources is: <https://recalibrate.berkeley.edu/>
Remember that seeking help is a good and courageous thing to do – both for yourself and for those who care about you.

Accommodations

Students who need academic accommodations, should request them from the Disabled Students' Program, 260 César Chávez Center, 642-0518 (voice or TTY), <https://dsp.berkeley.edu>. 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.

We are committed to fully supporting our students with disabilities, including meeting accommodations listed in a DSP letter. If you would like to discuss your accommodations with an instructor, please reach out to us.

If there are any conflicts with the due dates of the exams or assignments for religious reasons, travel for campus sponsored extracurricular activities, medical and graduate school interviews, or for other reasons, please contact us.

Academic Honesty

We expect you to do your own work and to uphold the standards of intellectual integrity. If you are having trouble with an assignment or studying for an exam, or if you are uncertain about permissible and impermissible conduct or collaboration, please come see us with your questions. UC Berkeley's cheating policy (<http://bulletin.berkeley.edu/academic-policies/#studentconductappealstext>) will be followed.

Incomplete Policy

Under emergency/special circumstances, students may petition to receive an incomplete grade. Please clearly state your reasoning in your comments to us.

Letters of Recommendation:

We are quite willing to provide letters of recommendation as needed for any of your applications (such as medical and graduate school and/or job opportunities). In addition to participating in the classroom discussions, please be sure to attend several of our course office hours. After the end of the course, please request an interview with one of us and send us a copy of your complete unofficial transcript, your CV and Personal Statement along with any recommendation forms that need to be filled in.

Additional Course Policies

- Be sure to pay close attention to deadlines.
- If you have a conflict with the midterm or due dates of assignments, please see us in advance.
- For unexpected emergencies, please email us.
- You may discuss the general features of your discussion section assignments with other students, but the assignment that you submit must be completed on your own.

Evaluation of the Course

Please let us know how things are going during the course by email or in person. Sometime during the middle of the semester we may solicit your feedback more formally on what is working well and what needs to be changed. Also, if you see any of us around campus (or at any sports events or other activities), feel free to introduce yourself and let us know how everything is going with the class and/or ask any questions.

Fine Print

The course deadlines, assignments, exam times and material are subject to change and you will be informed of any changes.

Schedule of lecture topics

The exact schedule may change depending on how the course is going.

Week	Dates	Lectures	Topics
1	Jan 20-22	1-2	Stem cells, cell signaling and tissues
2	Jan 25-29	3-5	Embryonic stem cells
3	Feb 1-5	6-8	Adult stem cells and gene expression
4	Feb 8-12	9-11	iPSCs and hematopoietic stem cells
5	<i>Feb 15</i>		<i>No class (President's Day)</i>
	Feb 17		Review for exam 1
	Feb 19		Midterm 1 (covers Lec 1-11)
6	Feb 22-26	12-14	Genetic engineering
7	Mar 1-5	15-17	Somatic cell nuclear transfer and cloning
8	Mar 8-12	18-20	Bioengineering and regeneration
9	Mar 15-19	21-23	Neural stem cells
	<i>Mar 22-26</i>		<i>Spring break</i>
10	Mar 29	24	Sci-fi and stem cells
	Mar 31		Review for exam 2
	Apr 2		Midterm 2 (covers Lec 12-24)
11	Apr 5-9	25-27	Muscle stem cells
12	Apr 12-16	28-30	Pancreatic stem cells and diabetes, Aging
13	Apr 19-23	31-33	Aging, ovarian stem cells
14	Apr 26-30	34-36	Cancer stem cells
15	May 5		RRR week review
	May 10		Final exam (cumulative)