MCB 38: Stem Cell Biology, Ethics and Societal Impact
Spring 2023
Lectures: MWF 9-10am, 2060 VLSB

Instructors

Robin Ball, rwball@berkeley.edu**,** 134 Weill Hall

Gary Firestone, glfire@berkeley.edu, 565 Weill Hall

Graduate Student Instructors (GSI)

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. Attendance in discussion sections is required. 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. Your lowest two discussion section scores will be dropped (in other words you can miss two classes without a consequence). If you need to miss more classes than that for an excused reason, please contact your GSI for make-up assignments.

Discussion sections start during the first week of class (Jan 20).

Section	Day/time	Location	GSI
101	F 11am	109 Morgan	Mihir
102	F 12pm	109 Morgan	Mihir
103	F 1pm	223 Dwinelle	Rebecca
104	F 2pm	209 Dwinelle	Rebecca

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.

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.

Attendance policies

You are expected to attend discussion section regularly. We will drop your lowest two discussion section scores, so you can miss two classes without a consequence. If you have more excused absences, contact your GSI about make-up assignments.

Lectures will be recorded via course capture and posted in the Media Gallery on bCourses. We use the chalkboard during lecture (no slides), so you may not be able to see everything that is written on the board in the recordings. We encourage you to attend lecture regularly.

If you have tested positive for Covid-19 or if you are feeling ill or have been asked to quarantine, please do not come to in-person classes. We want to keep our community safe, so please always follow the rules set out by the University and your instructors.

Grades

Discussion section assignments: 10%
Homework assignments: 10%
2 Midterms: 2 x 25% = 50%
Final: 30%

Grades will not be curved, so you are not in competition with each other. Grades will be determined using a standard grading scale.

A (some form of an A)	100-90%	D (some form of a D)	69-60%
B (some form of a B)	89-80%	F	59-00%
C (some form of a C)	79-70%		

Discussion section assignments: In discussion section you will complete activities with other students in order to receive credit for attendance and participation. 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 take place in-person in lecture (50 minutes total). The exams will be a combination of multiple choice, short answer questions and primarily short essay questions (you won't have to write more than 4-5 sentences).

Midterm 1 (covers Lec 1-12) is on Friday February 17
Midterm 2 (covers Lec 13-23) is on Friday March 24 (right before spring break)

The final exam is cumulative and takes place Monday May 8, 7-10pm.

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 workplace 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
If you need accommodations for any physical, psychological, or learning disability, or if you want instructors to have emergency medical information, please speak to one of us privately, either after class or during office hours.

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 Accommodations Hub
The purpose of academic accommodations is to ensure that all students have a fair chance at academic success. Disability, or hardships such as basic needs insecurity, uncertain documentation and immigration status, medical and mental health concerns, pregnancy and parenting, significant familial distress, and experiencing sexual violence or harassment, can affect a student's ability to satisfy particular course requirements. Students have the right to reasonable academic accommodations, without having to disclose personal information to instructors. For more information about accommodations, please see the Academic Accommodations hub website: https://evcp.berkeley.edu/programs-resources/academic-accommodations-hub#accommodations
The website provides a range of helpful campus resources, and we encourage you to use it.

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