



BISC 314L – Cell Culture

Units: 4

Fall 2024

Lectures: Mondays & Wednesdays 9:00-10:20am

Lab: Fridays 9:00-11:50am

Location: ZHS 454

Lab Location: ZHS 454

Instructor: Rory Spence

Office: TBD

Office Hours: TBD

Contact Info: rspence@usc.edu

Teaching Assistant: TBD

Office: TBD

Office Hours: TBD

Contact Info: TBD

Course Description

This course provides students with the skills and knowledge to work in a modern biological research laboratory making use of cell culture techniques. An emphasis will be placed on mammalian systems. Topics include aseptic techniques for animal cell culture, the requirements for cell growth in vitro, mechanisms underlying cellular differentiation, cryopreservation, subculturing, research applications and the expression of transfected DNA in cultured animal cells. The class will be a combination of lecture per week and laboratory. Lectures will be Mondays and Wednesdays; laboratories will be Fridays.

Learning Objectives

- 1) To be proficient at basic cell culture procedures and their application in experiments typical of a modern biological research laboratory.
- 2) To effectively analyze experimental data and present the results in an understandable research format using computer based scientific programs.
- 3) To apply good writing and oral skills to effective scientific communication of experimental results.

Prerequisite(s): BISC 120Lg and/or BISC 220Lg

Co-Requisite(s): You must sign up for General Lab Safety (GLS) and Principles of Biosafety (BIO) with EHS at USC. If you have already completed GLS and BIO please email the instructor the certificate. If you need to take these 2 classes, please enroll at the link below. The classes are offered on zoom on a monthly basis.

<https://ehs.usc.edu/training/registration/>

Course Notes

This course will consist of a combination of lecture and laboratory. Your presence and participation are mandatory.

Technological Proficiency and Hardware/Software Required

Access to a computer and free Microsoft packages available for all students.

USC Technology Rental Program

If you need resources to successfully participate in your classes, such as a laptop or internet hotspot, you may be eligible for the university's equipment rental program. To apply, please submit an application using this link: [USC Computing Center Laptop Loaner Program](#).

USC Technology Support Links

USC Technology provides software and support:

[Zoom information for students](#)

[Blackboard help for students](#)

[Software available to USC Campus](#)

Required Readings and Supplementary Materials

You will be provided primary literature articles, method protocols, background reading and background videos - all provided by the professor and posted on blackboard. Note, in order to access primary literature for free you need to use a VPN or a USC wireless account. Links to all primary articles and videos are located in the Course Schedule. You will also need to provide some of your own PPE. You must purchase a laboratory coat and goggles/eye protection. We will provide you with gloves.

Description and Assessment of Assignments

You will be required to keep a detailed and well organized digital laboratory notebook. We will use google documents and there will be 10 graded notebook checks by the professor. A rubric and example of a high-quality notebook will be provided for you. The notebook checks will be done by the professor prior to the Monday's class at 9am. See course schedule for details.

We will also have group presentations of original peer-reviewed research articles. Presentations will be groups of 2. The instructor will assign groups in week 2. The presentation will be 10-15 minutes google slide presentation based on a peer-reviewed paper of the groups choosing. The paper must be chosen prior to week 8 and the topic must be related to Biotechnology. The instructor will have final approval over the topic. Students will present in either week 14 or week 15 of the semester. A grading rubric for the presentation will be provided to you. Please note that 20% of the presentation grade will be assessed individually. 80% of the presentation grade will be applied to both members of the group.

Instead of a traditional midterm and final exam, the midterm and final will be a combination of written questions as well as a practicum of skills that you have learned and practiced over the semester. A study guide of topics and skills will be provided to you. The midterm will occur week 8. The final practicum will occur during finals week according to Final Examinations Schedule.

Participation is dependent on your attitude, enthusiasm and treatment of your classmates and professor. Critical thinking and sharing of ideas will be highly valued by your instructor. You are expected to come to class, well prepared, in full PPE, and with pre-reading of articles completed.

Grading Breakdown

Assignment	Points	% of Grade
Digital Laboratory Notebook (10x)	100	20
Group Presentations	100	20
Midterm Practicum	125	25
Participation	50	10
Final Practicum	125	25
Total	500	100

Grading Scale

Late work: Late work will include a daily 5% deduction for that assignment. Final grades are based on the total points earned in the course. Course grades will be determined according to the following scale. Instructors reserve the right to adjust the grading scale at the end of semester.

A 93-100, A- 90-92, B+87-89 ,B 83-86, B- 80-82, C+ 77-79, C 73-76, C-70-72
D+ 67-69, D63-66, D- 60-62, F59 and below

Academic Integrity

The University of Southern California is foremost a learning community committed to fostering successful scholars and researchers dedicated to the pursuit of knowledge and the transmission of ideas. Academic misconduct is in contrast to the university's mission to educate students through a broad array of first-rank academic, professional, and extracurricular programs and includes any act of dishonesty in the submission of academic work (either in draft or final form).

This course will follow the expectations for academic integrity as stated in the [USC Student Handbook](#). All students are expected to submit assignments that are original work and prepared specifically for the course/section in this academic term. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s). Students suspected of engaging in academic misconduct will be reported to the Office of Academic Integrity.

Other violations of academic misconduct include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see the [student handbook](#) or the [Office of Academic Integrity's website](#), and university policies on [Research and Scholarship Misconduct](#).

Course Content Distribution and Synchronous Session Recordings Policies

USC has policies that prohibit recording and distribution of any synchronous and asynchronous course content outside of the learning environment.

Recording a university class without the express permission of the instructor and announcement to the class, or unless conducted pursuant to an Office of Student Accessibility Services (OSAS) accommodation. Recording can inhibit free discussion in the future, and thus infringe on the academic freedom of other students as well as the instructor. ([Living our Unifying Values: The USC Student Handbook](#), page 13).

Distribution or use of notes, recordings, exams, or other intellectual property, based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study. This includes but is not limited to providing materials for distribution by services publishing course materials. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relationship to the class, whether obtained in class, via email, on the internet, or via any other media. ([Living our Unifying Values: The USC Student Handbook](#), page 13).

Course Schedule

Week	Before Class	Lecture Topic		Lab Topic	Assignment Due
		Monday, Wednesday	Friday		
1	<u>PPE</u> <u>Lab Notebook</u>	Introduction to Cell Culture: History and Current Use	Lab Orientation	EHS Training	
2	<u>Working in a Hood</u> <u>Micropipettor</u>	Cell Lines: Who, When and Why	Aseptic Technique		
3	<u>Aseptic Technique</u> <u>Plating</u>	Physical and Chemical Characteristics of Media and Serum	Passaging Cells	Note Book Check	
4	<u>Cell Counting</u> <u>Cell Proliferation</u>	Cell Cycles	Passaging Cells	Note Book Check	
5	<u>Passaging</u> <u>Cell Growth, Survival</u>	Growth Factors and Hormones	Measuring Cell Growth and Data Collection	Note Book Check	
6	<u>SC Differentiation</u>	cDNA, RNA, Protein	Measuring Cell Growth and Data Collection	Note Book Check	
7	<u>FACS</u>	Cell Separation Techniques	Cell Counting, Disaggregation, Autoclave	Note Book Check	
8	Choose Presentation Topic	Midterm	Midterm Practicum		
9	<u>Transfection</u>	Transfection, Antibodies	Crispr Transfection	Note Book Check	
10	<u>Microscopy</u> <u>Optical</u>	Microscope Imaging and Applications	Crispr Transfection	Note Book Check	
11	<u>Imaging</u>	Microscope Imaging and Applications	Crispr Transfection	Note Book Check	
12	<u>CAR-T</u>	CAR-T Therapy I	Epi-Microscopy	Note Book Check	
13	<u>Crispr CAR-T</u>	CAR-T Therapy II	Epi-Microscopy	Note Book Check	
14	Audience required to pre-read the papers selected by classmates for their presentation.	Biotechnology	Student Presentations	Presentations	
15	Audience required to pre-read the papers selected by classmates for their presentation.	Biotechnology	Student Presentations	Presentations	

16	Final Exam		Refer to the final exam schedule in the USC <i>Schedule of Classes</i> at classes.usc.edu .
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Statement on Academic Conduct and Support Systems

Academic Integrity:

The University of Southern California is a learning community committed to developing successful scholars and researchers dedicated to the pursuit of knowledge and the dissemination of ideas. Academic misconduct, which includes any act of dishonesty in the production or submission of academic work, comprises the integrity of the person who commits the act and can impugn the perceived integrity of the entire university community. It stands in opposition to the university’s mission to research, educate, and contribute productively to our community and the world.

All students are expected to submit assignments that represent their own original work, and that have been prepared specifically for the course or section for which they have been submitted. You may not submit work written by others or “recycle” work prepared for other courses without obtaining written permission from the instructor(s).

Other violations of academic integrity include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), collusion, knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university. All incidences of academic misconduct will be reported to the Office of Academic Integrity and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see [the student handbook](#) or the [Office of Academic Integrity’s website](#), and university policies on [Research and Scholarship Misconduct](#).

Please ask your instructor if you are unsure what constitutes unauthorized assistance on an exam or assignment, or what information requires citation and/or attribution.

Students and Disability Accommodations:

USC welcomes students with disabilities into all of the University’s educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support Systems:

[Counseling and Mental Health](#) - (213) 740-9355 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

[988 Suicide and Crisis Lifeline](#) - 988 for both calls and text messages – 24/7 on call

The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

[Relationship and Sexual Violence Prevention Services \(RSVP\)](#) - (213) 740-9355(WELL) – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

[Office for Equity, Equal Opportunity, and Title IX \(EEO-TIX\)](#) - (213) 740-5086

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

[Reporting Incidents of Bias or Harassment](#) - (213) 740-5086 or (213) 821-8298

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

[The Office of Student Accessibility Services \(OSAS\)](#) - (213) 740-0776

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

[USC Campus Support and Intervention](#) - (213) 740-0411

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

[Diversity, Equity and Inclusion](#) - (213) 740-2101

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

[USC Emergency](#) - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

[USC Department of Public Safety](#) - UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call

Non-emergency assistance or information.

[Office of the Ombuds](#) - (213) 821-9556 (UPC) / (323-442-0382 (HSC)

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

[Occupational Therapy Faculty Practice](#) - (323) 442-2850 or otfp@med.usc.edu

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.