**Molecular Biology - BISC 320L**

Fall 2020

Lectures will be held online: MWF 11:00 a.m.-11:50 a.m., and MWF 12:00 p.m.-12:50 p.m.

Faculty and Staff: Oscar Aparicio, Ph.D., Professor (oaparici@usc.edu)

Carolyn Phillips, Ph.D., Assistant Professor (cphil@usc.edu)

Irene Chiolo, Ph.D., Associate Professor (chiolo@usc.edu)

Eric Noakes, M.S., Instructional Laboratory Manager (enoakes@usc.edu)

Office hours: Aparicio Mondays 2:30-4:30 PM by Zoom (8/17-9/16)

Phillips Mondays 2:30-4:30 PM by Zoom (9/18-10/16)

Chiolo Mondays 2:30-4:30 PM by Zoom (10/19-11/13)

Textbook: Molecular Biology – Principles of Genome Function, Craig et al., 2nd edition

Readings from these texts are assigned on the lecture schedule. It is important to read the assignments prior to the corresponding lectures.

The course grade will be based upon **400** possible points:

100 pts Midterm #1

100 pts Midterm #2

100 pts Lab

100 pts Final Exam

In case a midterm exam must be missed for legitimate reasons, discuss the situation with the course instructor **prior** to the exam, if possible. There is no extra credit offered for the course. Final letter grades are assigned on a curve, determined entirely by the total number of points earned on lecture exams and in the laboratory portion of the course. *No make-up exams will be given in this course*. If you miss a midterm due to illness, you must present a valid medical excuse to the laboratory director within one week of the missed exam. If you have a valid excuse, your exam score will be determined by prorating scores of the remaining two exams. Rules governing exams are given in more detail in your Student Contract, which is also posted on the class website: https://blackboard.usc.edu

Lab Sections: See separate syllabus and lab manual.

Course Objectives: The student will learn the structure and function of biological macromolecules, in particular nucleic acids (DNA and RNA) and proteins and how these molecules act to copy, express and accurately transmit genetic information. The course focuses on mechanisms of: DNA replication, transcription, translation (protein synthesis) and the genetic code, DNA repair, recombination and DNA rearrangements. Techniques used to study molecular biology are presented in the context of these major biological mechanisms.

Lectures: It is important to attend all of the lectures during the course and to take good notes for study. Prior to attending each lecture, it is important to have read the appropriate portions of the textbook. However, many of the lectures will contain new and additional information that is not in the textbook. Examinations will be based mainly on information given in the lectures. In studying for examinations, complete and accurate lecture notes are of prime importance. The lecture slides posted on the course Blackboard site (https://blackboard.usc.edu) may contain material that is not in the lectures and the lectures will often contain additional information that is not conveyed in the slides. Lecture attendance is essential. It may be necessary to make some adjustments in the syllabus during the semester.

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| Date | Reading assignment | Topics covered |
| Week 1 8/17-21 | Chap 1 and 2 –**Aparicio Lectures** | Genomes and the flow of Biological Information “Central Dogma”, Biological molecules |
| Week 2 8/24-28 | Chap 2, (3), 4 | Biological molecules  Chemical Basis of Life |
| Week 3 8/31- 9/4 | Chap 4 | Chromosome structure and function  DNA Topology |
| Week 4  9/9-11 | Chap 19.3, 19.4, 19.8. Begin Chap 6  9/7 is Labor Day | DNA Sequencing, Polymerase Chain Reaction (PCR), DNA Replication |
| Week 5  9/14-16 | Chap 6. **Midterm 1 (Wednesday 9/16).** **You must take each midterm in the lecture period in which you are registered.** | DNA Replication, Chromosome Segregation |
| Week 5  continued  9/18 | Chap 8-**Phillips begins lecturing (Friday 9/18)** | Transcription |
| Week 6  9/21-25 | Chap 8, 9, 10 | Transcription, Regulation of transcription, RNA processing |
| Week 7 9/28-10/2 | Chap 10, 11 | RNA splicing, RNA editing, Translation |
| Week 8  10/5-9 | Chap 11, (12) | Translation and the ribosome, (regulation of translation) |
| Week 9 10/12-16 | Chap 13.  **Midterm 2 (Friday 10/16). You must take the midterm in the lecture period in which you are registered.** | Regulatory RNAs, small RNAs, long non-coding RNAs |
| Week 10  10/19-23 | Chap 15, 16. **Chiolo Begins lecturing (Monday 10/19)** | Types of DNA damages and repair pathways (MMR, Direct reversal, BER, NER, TLS) |
| Week 10  10/26-30 | Chap 16 | Cellular responses to DNA damage, DSB repair, Homologous Recombination |
| Week 11  11/2-6 | Chap 16 | HR intermediates, HR proteins, meiotic recombination, techniques to study HR repair. |
| Week 12  11/9-13 | Chap 17 | Transposons, site-specific recombination, VDJ recombination |
| 11/17 | **Final Exam – Tuesday 11/17 – 4:30pm** |  |

### Statement on Academic Conduct and Support Systems

**Academic Conduct:**

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” [policy.usc.edu/scampus-part-b](https://policy.usc.edu/scampus-part-b/). Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, [policy.usc.edu/scientific-misconduct](http://policy.usc.edu/scientific-misconduct).

**Support Systems:**

*Student Health Counseling Services - (213) 740-7711 – 24/7 on call*

[engemannshc.usc.edu/counseling](https://engemannshc.usc.edu/counseling/)

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

*National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call*

[suicidepreventionlifeline.org](http://www.suicidepreventionlifeline.org/)

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

*Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-4900 – 24/7 on call*

[engemannshc.usc.edu/rsvp](https://engemannshc.usc.edu/rsvp/)

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

*Office of Equity and Diversity (OED) | Title IX - (213) 740-5086*

[equity.usc.edu](https://equity.usc.edu/), [titleix.usc.edu](http://titleix.usc.edu)

Information about how to get help or help a survivor of harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants. The university prohibits discrimination or harassment based on the following protected characteristics: race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, age, physical disability, medical condition, mental disability, marital status, pregnancy, veteran status, genetic information, and any other characteristic which may be specified in applicable laws and governmental regulations.

*Bias Assessment Response and Support - (213) 740-2421*

[studentaffairs.usc.edu/bias-assessment-response-support](https://studentaffairs.usc.edu/bias-assessment-response-support/)

Avenue to report incidents of bias, hate crimes, and microaggressions for appropriate investigation and response.

*The Office of Disability Services and Programs - (213) 740-0776*

[dsp.usc.edu](http://dsp.usc.edu/)

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

*USC Support and Advocacy - (213) 821-4710*

[studentaffairs.usc.edu/ssa](https://studentaffairs.usc.edu/ssa/)

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

*Diversity at USC - (213) 740-2101*

[diversity.usc.edu](https://diversity.usc.edu/)

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*

[dps.usc.edu](http://dps.usc.edu/), [emergency.usc.edu](http://emergency.usc.edu/)

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) 442-120 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu/)

Non-emergency assistance or information.