

BISC 429, Cancer Immunology

Units: 4 units

Spring 2022—Wed and Fri —Time: 2:00pm – 3:20 pm

Location: ZHS 360

Instructor: Raffaella Ghittoni, Ph.D.

Office: ZHS-256

Office Hours: TBD

Contact Info: rghitton@usc.edu,

Personal Meeting Zoom room:

<https://usc.zoom.us/j/5162230860?pwd=YnczdFJub0YySHJkTWVVM1Z0Q0lnZz09>

Meeting ID: 516 223 0860

Passcode: 2u306v

Course Description

Cancer immunology is a branch of immunology that studies interactions between the immune system and cancer cells (also called tumors or malignancies). This course has a single-discipline perspective approach to provide students with the necessary background and scientific tools to understand the role of the immune system in oncogenesis. The course serves as an ideal primer for students who seek an entry point to the domain of cellular transformation, carcinogenesis and immune surveillance. Cancer immunology is a growing field of research that aims to discover innovative cancer immunotherapies to treat and retard progression of the disease. Currently adopted immune-based therapies and new possible approaches in cancer treatment are extensively discussed all along the course. Guest lectures from selected invited speakers have been hosted in class to give students the possibility to meet, talk and interact with professional experts of this field.

Learning Objectives

In this course students will have the possibility to acquire knowledge on the main current topics related to the human immune system and cellular transformation and carcinogenesis.

After an introductory section on terminology and general aspects on cellular transformation, the course will mainly focus on key aspects in the interplay between the immune response and the establishment of malignancies as risk factors in carcinogenesis with an in depth on pathogen related factors, the impact of tumor affecting directly the immune system, the fundamental role of immune cells surveillance, cytokines and inflammation in carcinogenesis.

Seminars: One (or two) class meeting will consist of a research seminar presentation by an invited member who is conducting fundamental or clinical cancer research. This will be followed by a discussion. This will give students the possibility to meet, talk and interact with professionals of this field. Seminars will be scheduled depending on our guest's availability and research area to coordinate with appropriate class topics.

Students group presentation: During the semester students will have to organize in groups of two and select a research paper related to the topics discussed in class. Each group will be evaluated for critically presenting the paper in the discussion session and for participating as discussant during other group presentations.

The course readings are based on suggested textbooks and current scientific literature (experimental and reviews publications)

Course Textbook: Robert Weinberg. The Biology of Cancer (2nd edition). Garland Science

Prerequisites: none

Recommended Preparation: Biology/Biochemistry majors, or graduate students enrolled in biological sciences. Registration is limited to 20 students. Familiarity with Molecular Biology, Genetics, Principles of Immunology is assumed.

Course Notes

Course grading distribution:

Midterm I	25%
Midterm II	25%
Presentation	25%
Final exam	25%

Description and Assessment of Assignments

Tests and final exams are marked on a numerical basis and then converted to letter grades. All scores are posted in your GRADEBOOK unless noted. If you notice a mistake or missing score(s) in the gradebook, it is student's responsibility to notify the course instructor as soon as possible.

Course Policies:

- 1) Exam dates are firm. There are no makeup exams in the course. Performance on the final may be prorated to substitute for a missing midterm exam, if an excuse considered valid by faculty is presented in a timely fashion. An acceptable written excuse or documentation must be provided to the faculty. The final exam will be administered only on the date and time set by the University.
- 2). Midterm exams will be returned to students by the professor during lectures. The final examination will not be returned but will be retained for one semester by the faculty.
- 3) Regrades: If you think an answer you have provided was graded incorrectly or if there is an arithmetic error, you may seek a regrade. You must provide a written explanation of why you think your answer was graded incorrectly. Regrade requests are to be submitted to your instructor. If a regrade is agreed upon, then the ENTIRE EXAMINATION may be subject to a regrade. Your grade may therefore go up, go down, or remain the same. Regrade requests must be received within one week of when the exam key is posted for midterms, or by the second week of classes the following semester for the final exam.
- 4) No special assignments for extra credit are permitted.
- 5) Academic integrity policies of the University will be strictly followed. Infractions can result in severe penalties. There may be assigned seating for exams. No student may be admitted to an exam after the first student has left the exam.
- 7) It may be necessary to make adjustments to the syllabus during the semester. Check the course website or class announcements on Blackboard for updates. Exam dates will not be changed.
- 8) Any questions or concerns regarding these policies should be addressed to the faculty.
- 9) Statement on Academic Conduct and Support Systems

All USC students are responsible for reading and following the Student Conduct Code, which appears in the SCampus and at <https://scampus.usc.edu/university-student-conduct-code/>. This policy does not apply to discussion or exchange of ideas. On the contrary, such interactions represent an important way to clear programming hurdles.

Course Schedule:

	Topics Covered	
Jan 12	Cancer and the human immune system– Course introduction	
Jan 14	The biology and genetics of cells and organisms (part I)	Ch.1.5 /12.9
Jan 19	The biology and genetics of cells and organisms (part II)	Ch.1
Jan 21	The Nature of Cancer - Terminology and common types of cancer (part I)	Ch.2
Jan 26	The Nature of Cancer - Terminology and common types of cancer (part II)	Ch.2
Jan 28	The Nature of Cancer - Terminology and common types of cancer (part III)	Ch.2
Feb 2	Oncoviruses (part I)	Ch.3
Feb 4	Oncoviruses (part II)	Ch.3
Feb 9	Tumor viruses (part III) Human Papilloma Virus and carcinogenesis	Review
Feb 11	MIDTERM I	
Feb 16	Guest Lecture: TBD	Slides ppt
Feb 18	Oncogenes/Tumor suppressor genes	Ch.9 + Ch 11
Feb 23	Human Immune system	Ch 15
Feb 25	Inflammation and cancer –part I	Ch.11
Mar 2	Inflammation and cancer part II - Obesity	Ch.9
Mar 4	Immunosurveillance part I	Ch 15
Mar 9	Guest Lecture: TBD	Slides ppt
Mar 11	Immunosurveillance part II	Selected article
Mar 16	Spring recess	
Mar 18	Spring recess	
Mar 23	Tumor antigens I	Ch. 15
Mar 25	Tumor antigens II	Ch. 15
Mar 30	Midterm II	
Apr 1	Immunosurveillance evasion I	Ch.15
Apr 6	Immunosurveillance evasion II	Ch. 15
Apr 8	Antibodies and Cell-Based immunotherapy – Vaccines	Ch. 15
Apr 13	Guest Lecture: TBD	Slides ppt
Apr 15	Student presentation	Selected article
Apr 20	Students presentation	Selected article
Apr 22	Students presentation	Selected article
Apr 27	Students presentation	Selected articles
Apr 29	Students presentation	Selected articles
May 9	Final Examination from 2 to 4 pm	ZHS360

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” <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, <http://policy.usc.edu/scientific-misconduct>.

Support Systems

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

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. <https://engemannshc.usc.edu/counseling/>

National Suicide Prevention Lifeline - 1-800-273-8255

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. <http://www.suicidepreventionlifeline.org>

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

Free and confidential therapy services, workshops, and training for situations related to gender-based harm. <https://engemannshc.usc.edu/rsvp/>

Sexual Assault Resource Center

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: <http://sarc.usc.edu/>

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086

Works with faculty, staff, visitors, applicants, and students around issues of protected class. <https://equity.usc.edu/>

Bias Assessment Response and Support

Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. <https://studentaffairs.usc.edu/bias-assessment-response-support/>

Office of Student Accessibility Services (OSAS)

Provides certification for students with disabilities and helps arrange relevant accommodations. <https://osas.usc.edu/>

Student Support and Advocacy – (213) 821-4710

Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. <https://studentaffairs.usc.edu/ssa/>

Diversity at USC

Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. <https://diversity.usc.edu/>

USC Emergency Information

Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible, <http://emergency.usc.edu>

USC Department of Public Safety – 213-740-4321 (UPC) and 323-442-1000 (HSC) for 24-hour emergency assistance or to report a crime. Provides overall safety to USC community. <http://dps.usc.edu>

