

## **BISC 429, Cancer Immunology**

**Units: 4 units**

**Spring 2020—Wed and Fri —Time: 2:00pm – 3:20 pm**

**Location: ZHS360**

**Instructor: Raffaella Ghittoni, Ph.D.**

**Office: ZHS-256**

**Office Hours: Tuesday and Thursday from 11 am to 12 pm**

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### **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 (2<sup>nd</sup> edition). Garland Science

### **Prerequisites:**

**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 15	Cancer and the human immune system– Course introduction	
Jan 17	The biology and genetics of cells and organisms (part I)	Ch.1.5 /12.9
Jan 22	The biology and genetics of cells and organisms (part II)	Ch.1
Jan 24	The Nature of Cancer - Terminology and common types of cancer (part I)	Ch.2
Jan 29	The Nature of Cancer - Terminology and common types of cancer (part II)	Ch.2
Jan 31	The Nature of Cancer - Terminology and common types of cancer (part III)	Ch.2
Feb 5	Oncoviruses (part I)	Ch.3
Feb 6	Oncoviruses (part II)	Ch.3
Feb 12	Tumor viruses (part III) Human Papilloma Virus and carcinogenesis	Review
Feb 14	<b>MIDTERM I</b>	
Feb 19	<a href="#">Guest Lecture: TBD</a>	<a href="#">Slides ppt</a>
Feb 21	Oncogenes/Tumor suppressor genes	Ch.9 + Ch 11
Feb 26	Human Immune system	Ch 15
Feb 28	Inflammation and cancer –part I	Ch.11
Mar 4	Inflammation and cancer part II - Obesity	Ch.9
Mar 6	Immunosurveillance part I	Ch 15
Mar 11	<a href="#">Guest Lecture: TBD</a>	<a href="#">Slides ppt</a>
Mar 13	Immunosurveillance part II	<a href="#">Selected article</a>
Mar 18	<a href="#">Spring recess</a>	
Mar 20	<a href="#">Spring recess</a>	
Mar 25	Tumor antigens I	Ch. 15
Mar 27	Tumor antigens II	Ch. 15
Apr 1	<b>Midterm II</b>	
Apr 3	Immunosurveillance evasion I	Ch.15
Apr 8	Immunosurveillance evasion II	Ch. 15
Apr 10	Antibodies and Cell-Based immunotherapy – Vaccines	Ch. 15
Apr 15	<a href="#">Guest Lecture: TBD</a>	<a href="#">Slides ppt</a>
Apr 17	<a href="#">Student presentation</a>	<a href="#">Selected article</a>
Apr 22	<a href="#">Students presentation</a>	<a href="#">Selected article</a>
Apr 24	<a href="#">Students presentation</a>	<a href="#">Selected article</a>
Apr 26	<a href="#">Students presentation</a>	<a href="#">Selected articles</a>
Apr 28	<a href="#">Students presentation</a>	<a href="#">Selected articles</a>
<b>May 11</b>	<b>Final Examination from 2 to 4 pm</b>	<b>ZHS360</b>

## 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](http://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. [engemannshc.usc.edu/counseling](http://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. [www.suicidepreventionlifeline.org](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. [engemannshc.usc.edu/rsvp](http://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: [sarc.usc.edu](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. [equity.usc.edu](http://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. [studentaffairs.usc.edu/bias-assessment-response-support](http://studentaffairs.usc.edu/bias-assessment-response-support)

*The Office of Disability Services and Programs*

Provides certification for students with disabilities and helps arrange relevant accommodations. [dsp.usc.edu](http://dsp.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. [studentaffairs.usc.edu/ssa](http://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. [diversity.usc.edu](http://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. [emergency.usc.edu](http://emergency.usc.edu)

*USC Department of Public Safety – UPC: (213) 740-4321 – HSC: (323) 442-1000 – 24-hour emergency or to report a crime.*

Provides overall safety to USC community. [dps.usc.edu](http://dps.usc.edu)