Prevention and Therapy in the Modern Era: From Bench to Bedside

Units: 4

Monday and Wednesday 1:00 pm to 2:50 pm

Location: DMC (Joseph Medicine Crow for International and Public Affairs)

Course Coordinators:

Course Coordinator: Professor Yves A. DeClerck MD, declerck@usc.edu

Coordinator Module 1, 2 and 6: Professor Abdullah Ladha MD, abdullah.Ladha@med.usc.edu

Coordinator Module 3: Professor Jennifer Unger PhD, junger@usc.edu

Coordinator Module 4: Professor James Amatruda MD, PhD, jamatruda@chla.usc.edu

Coordinator Module 5: Professor Shannon Mumenthaler PhD, smumenthaler@usc.edu

Course Description

Summary: Through interactive and engaging talks from a group of expert instructors, the course will provide students with a broad overview of cancer, including prevention, social issues, therapy, cancer biology and emerging new treatment approaches. This course is targeted to students interested in careers in health sciences from a multidisciplinary perspective.

Objectives: The course has two major objectives.
1. To give students an in-depth knowledge of fundamental and clinical aspects of cancer by exposing them to
interactive lectures with a broad group of USC faculty from different disciplines and perspectives and make them appreciate the importance of convergent science in our efforts to tackle complex human diseases like cancer.

2. To give students an opportunity to discuss careers in cancer with clinical investigators, cancer researchers and cancer survivors at USC-Norris Comprehensive Cancer Center.

**Organization:** The course brings together a diverse group of USC faculty members committed to providing interactive and updated lectures.

The course is organized in six modules and a total of 25 submodules (classes)

**Module 1:** Clinical Presentations of Cancer: Melanoma, Leukemia and Lung Cancer.

**Module 2:** Current Cancer Treatments: Chemotherapy, Immunotherapy and Radiation Therapy

**Module 3:** Cancer Control and Prevention

**Module 4:** Cancer Biology

**Module 5:** Cancer Research

**Module 6:** Cancer Care and Careers in Cancer Health Care and Research

**Learning Objectives:**

1. Describe the different hallmarks on cancer and their fundamental mechanisms of action
2. Describe the contribution of data science and remote monitoring in the design and completion of population-based studies and intervention studies testing behavioral changes and cancer prevention
3. Describe how molecular biology and omics science have revolutionized our approach to cancer diagnosis and therapy and how such research has improved the health and survival of patients with cancer
4. Provide an understanding of the current approaches to cancer treatment including radiation therapy, chemotherapy, targeted therapy and immunotherapy and how biomarkers allow us to increasingly treat patients in a precise way (Precision medicine).
5. Provide an opportunity for students to meet PhD students and professionals who are dedicating their career to research and clinical oncology at USC.

**Prerequisite(s):**

**BISC-220 or 221.**

A solid knowledge and familiarity with molecular biology is recommended.

**Course outline:** Weekly Schedule Fall 2024: See table at end of syllabus
Communication:

All information regarding lectures, reading assignments, and homework will be posted on the Brightspace website. Only students who are registered for the course will have access to the website. This course will be given on site although it may require familiarity with use of the Zoom video-conferencing platform as some lectures could be delivered online-only via Zoom, without concurrent meeting in the lecture hall. It also requires that enrolled students have secured individual access to the course on Brightspace and know how to navigate this educational technology.

USC Technology Support Links:

Zoom information for students
Software available to USC Campus

Suggested reading material during the course:

Articles:

Book:
The Emperor of all Maladies by Siddhartha Mukherjee

Description of Assessments

The following assessment tools will be used.

1. **Short quizzes during a lecture**: Each instructor will be asked to include short quizzes with questions related to the presentation, that students will answer.
2. **Homework reading**: Each lecture will include articles that students will be asked to read before the lecture. The instructor will include a series of questions that students will be expected to answer/discuss during the second hour of the lecture.
3. **Multiple choice questions**: At the end of module 3 and module 6, students will complete a formal exam related to the material presented during the 3 previous modules. Exams will consist of multiple-choice questions to test knowledge.
4. **Research paper and presentation**: Each student will be asked to write a comprehensive 3–4-page research paper on one of the main topics of the course. Assignments will be given 6 weeks ahead of time. Such a paper will include a review of the literature on the subject. Each student will present this paper in the form of a brief oral presentation to the entire class during the last class.

**Participation/In-class work**
Students must attend all class sessions on time for the entire class. They are expected to come prepared (i.e., have reviewed and understood the pre-class assignments) and actively participate in every class. Discussion is essential. Students are expected to be active participants to get full credit, reading all assigned papers and joining in the conversation with questions or comments as appropriate. Points lost from missing participation may be replaced by an appropriate written assignment if an excuse considered valid by faculty is presented in a timely fashion. All absences require acceptable written excuse or documentation. Students failing to show up to a lecture without a previous valid excuse communicated to the module coordinator, will receive a zero for participation to that specific class. For sessions on Zoom, students are expected to use a video camera and interact with the instructor.

**Grading Breakdown**

<table>
<thead>
<tr>
<th>Assignment</th>
<th>% of Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module Exams (2) (20% each)</td>
<td>40</td>
</tr>
<tr>
<td>Participation and attendance</td>
<td>15</td>
</tr>
<tr>
<td>Research paper and oral presentation</td>
<td>45 (25 written; 20 oral)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

**Grading Scale**
Course final grades will be determined using the following scale.

- A  90-100
- A- 85-89
- B+ 80-84
- B  75-79
- B- 70-74
- C+ 66-69
- C  63-65
- C- 60-62
- D+ 56-59
- D  53-55
- D- 50-22
- F  49 and below

**Course-specific Policies**
Assignment Submission
All assignments (in-class work and presentation components) should be submitted through Brightspace. Student can get assistance on https://www.brightspacehelp/students

Grading Timeline
All graded work will be returned no later than 2 weeks from the submission deadline or exam date.

Late work
Late work will not be graded unless the student has a valid excuse and contacts the coordinator 2 days before the submission deadline.

Technology in the classroom
Technology including personal computers, tablets and smart phones should only be used with classroom activities. Familiarity with the Zoom video-conferencing platform and a working internet connection will be required for online sessions. Familiarity with USC’s Blackboard sites is also required.

Academic integrity
A grade of zero will be applied to submitted work that does not comply with the USC standards of academic conduct. Such work may not be resubmitted for a new grade.

Classroom norms
You are encouraged to ask the instructor questions for clarification, both in class and outside of class, to promote better learning. You are encouraged to share your views in the classroom whenever appropriate. You should also be open to hearing diverse opinions and communication styles.

Zoom etiquette: In case a class is given on zoom, students will have to use their video-camera.

Sharing of course materials outside of the learning environment
USC has a policy that prohibits sharing of any synchronous and asynchronous course content outside of the learning environment. Distribution or use of notes or recordings based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study is a violation of the USC Student Conduct Code. This includes providing materials for distribution by services publishing class notes. 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. (See Section C.1 Class Notes Policy).
Course evaluation

Two surveys will gather student opinions about the course: An early informal evaluation through a meeting with the coordinator will take place after the first three classes and a more detailed written evaluation will take place at the end of the semester. Students will have to submit their evaluations before receiving their final grade. The opinion and constructive critiques from students are valued and can make a difference in how this course is conducted and improved.

Statement on Academic Conduct and Support Systems

[The current Statement on Academic Conduct and Support Systems is a required component of all USC syllabi and is updated regularly. Faculty should use the latest version of the Statement on Academic Conduct and Support Systems found in the Curriculum Coordination Office’s Syllabus Template. The Statement below is current as of Spring 2021.]

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.” Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct.

Support Systems:

Counseling and Mental Health

phone number (213) 740-9355
On call 24/7
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

National Suicide Prevention Lifeline

Phone number 1 (800) 273-8255
On call 24/7
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)**  
Phone Number (213) 740-9355(WELL), press “0” after hours  
On call 24/7  
Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

**USC Office of Equity, Equal Opportunity, and Title IX**  
Phone number (213) 740-5086  
Title IX Office (213) 821-8298  
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**  
Phone number (213) 740-5086 or (213) 821-8298  
Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity, Equal Opportunity, and Title IX for appropriate investigation, supportive measures, and response.

**The Office of Disability Services and Programs**  
Phone number (213) 740-0776  
Support and accommodation 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 Campus Support and Intervention**  
Phone number (213) 821-4710  
Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

**Diversity at USC**  
Phone number (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 phone number (213) 740-4321
HSC phone number (323) 442-1000
On call 24/7
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 phone number (213) 740-6000
HSC phone number (323) 442-120
On call 24/7
Non-emergency assistance or information.
<table>
<thead>
<tr>
<th>Date</th>
<th>Module</th>
<th>Topic</th>
<th>Coordinator</th>
<th>Submodule</th>
<th>Topic</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday, August 26, 2024</td>
<td>Module 1</td>
<td>Clinical Aspects</td>
<td>A. Ladah MD</td>
<td>Submodule 1</td>
<td>Melanoma</td>
<td>James Hu MD</td>
</tr>
<tr>
<td>Wednesday, August 28, 2024</td>
<td>Module 1</td>
<td>Clinical Aspects</td>
<td>A. Ladah MD</td>
<td>Submodule 2</td>
<td>Leukemia</td>
<td>George Yaghmour MD</td>
</tr>
<tr>
<td>Monday, September 2, 2024</td>
<td>Module 1</td>
<td>Clinical Aspects</td>
<td>A. Ladah MD</td>
<td>Submodule 3</td>
<td>Lung Cancer</td>
<td>Jorge Nieva MD</td>
</tr>
<tr>
<td>Wednesday, September 4, 2024</td>
<td>Module 1</td>
<td>Course Overview, Expectations</td>
<td>Y. DeClerck MD</td>
<td>Submodule 4</td>
<td>History of Cancer Therapy</td>
<td>Yves DeClerck MD</td>
</tr>
<tr>
<td>Wednesday, September 11, 2024</td>
<td>Module 2</td>
<td>Current Cancer Therapy</td>
<td>A. Ladah MD</td>
<td>Submodule 1</td>
<td>Chemotherapy</td>
<td>Houda Alachkar PhD</td>
</tr>
<tr>
<td>Wednesday, September 18, 2024</td>
<td>Module 2</td>
<td>Current Cancer Therapy</td>
<td>A. Ladah MD</td>
<td>Submodule 2</td>
<td>Immunotherapy</td>
<td>Sandra Algaze MD</td>
</tr>
<tr>
<td>Wednesday, September 24, 2024</td>
<td>Module 2</td>
<td>Current Cancer Therapy</td>
<td>A. Ladah MD</td>
<td>Submodule 3</td>
<td>Radiation Therapy</td>
<td>Lauren Lukas MD</td>
</tr>
<tr>
<td>Monday, September 20, 2024</td>
<td>Module 3</td>
<td>Cancer Control and Prevention</td>
<td>J. Unger PhD</td>
<td>Submodule 1</td>
<td>Melanoma prevention</td>
<td>Myles Cockburn PhD</td>
</tr>
<tr>
<td>Wednesday, September 27, 2024</td>
<td>Module 3</td>
<td>Cancer Control and Prevention</td>
<td>J. Unger PhD</td>
<td>Submodule 2</td>
<td>Smoking and Cancer</td>
<td>Alyssa Harlow PhD</td>
</tr>
<tr>
<td>Monday, October 2, 2024</td>
<td>Module 3</td>
<td>Cancer Control and Prevention</td>
<td>J. Unger PhD</td>
<td>Submodule 3</td>
<td>Obesity and Cancer</td>
<td>Britni Belcher PhD, MPH</td>
</tr>
<tr>
<td>Wednesday, October 9, 2024</td>
<td>Module 4</td>
<td>Cancer Biology</td>
<td>J. Amatruda MD, PhD</td>
<td>Submodule 1</td>
<td>The Cancer Cell: Genomic instability</td>
<td>Jessica Tsai MD, PhD, PhD</td>
</tr>
<tr>
<td>Monday, October 14, 2024</td>
<td>Module 4</td>
<td>Cancer Biology</td>
<td>J. Amatruda MD, PhD</td>
<td>Submodule 2</td>
<td>The Cancer Cell: Proliferation vs Differentiation</td>
<td>James Amatruda MD, PhD</td>
</tr>
<tr>
<td>Wednesday, October 16, 2024</td>
<td>Module 4</td>
<td>Cancer Biology</td>
<td>J. Amatruda MD, PhD</td>
<td>Submodule 3</td>
<td>Inflammation and Immune Control</td>
<td>Keyue Chen PhD</td>
</tr>
<tr>
<td>Monday, October 21, 2024</td>
<td>Module 4</td>
<td>Cancer Biology</td>
<td>J. Amatruda MD, PhD</td>
<td>Submodule 4</td>
<td>Metastasis and Angiogenesis</td>
<td>Josh Ebrahim-Neman PhD</td>
</tr>
<tr>
<td>Wednesday, October 23, 2024</td>
<td>Module 5</td>
<td>Cancer Research</td>
<td>S. Mumenthaler PhD</td>
<td>Submodule 1</td>
<td>Engineered cancer models</td>
<td>Shannon Mumenthaler PhD</td>
</tr>
<tr>
<td>Monday, October 28, 2024</td>
<td>Module 5</td>
<td>Cancer Research</td>
<td>S. Mumenthaler PhD</td>
<td>Submodule 2</td>
<td>Drugs: From discovery to development</td>
<td>Steve Kay PhD</td>
</tr>
<tr>
<td>Wednesday, October 30, 2024</td>
<td>Module 5</td>
<td>Cancer Research</td>
<td>S. Mumenthaler PhD</td>
<td>Submodule 3</td>
<td>Theranostics</td>
<td>Cristina Zavaleta PhD</td>
</tr>
<tr>
<td>Monday, November 4, 2024</td>
<td>Module 5</td>
<td>Cancer Research</td>
<td>S. Mumenthaler PhD</td>
<td>Submodule 4</td>
<td>Multi-Omics</td>
<td>Jonathan Katz PhD</td>
</tr>
<tr>
<td>Wednesday, November 6, 2024</td>
<td>Module 5</td>
<td>Cancer Research</td>
<td>S. Mumenthaler PhD</td>
<td>Submodule 5</td>
<td>Systems biology to design effective therapies</td>
<td>Stacey Finley PhD</td>
</tr>
<tr>
<td>Monday, November 11, 2024</td>
<td>Module 5</td>
<td>Cancer Research</td>
<td>S. Mumenthaler PhD</td>
<td>Submodule 6</td>
<td>Big Data, Machine Learning and AI</td>
<td>Jerry Lee PhD</td>
</tr>
<tr>
<td>Wednesday, November 13, 2024</td>
<td>Module 6</td>
<td>Cancer Care</td>
<td>A. Ladah MD</td>
<td>Submodule 1</td>
<td>Precision Medicine in Cancer</td>
<td>Raghuvir Ranganathan MD</td>
</tr>
<tr>
<td>Monday, November 18, 2024</td>
<td>Module 6</td>
<td>Cancer Care</td>
<td>A. Ladah MD</td>
<td>Submodule 2</td>
<td>Ethical issues and end of life</td>
<td>Abdulish Ladha MD</td>
</tr>
<tr>
<td>Wednesday, November 20, 2024</td>
<td>Module 6</td>
<td>Cancer Care</td>
<td>A. Ladah MD</td>
<td>Submodule 3</td>
<td>Cancer Therapy: Biomarker led clinical trials</td>
<td>Kevin Kelly MD</td>
</tr>
<tr>
<td>Monday, November 25, 2024</td>
<td>Module 6</td>
<td>Cancer Care</td>
<td>A. Ladah MD</td>
<td>Submodule 3</td>
<td>Cancer Therapy: Biomarker led clinical trials</td>
<td>Kevin Kelly MD</td>
</tr>
<tr>
<td>Wednesday, November 27, 2024</td>
<td>Module 6</td>
<td>Cancer Care</td>
<td>Y. DeClerck MD</td>
<td>Submodule 4</td>
<td>Dialogue with survivors</td>
<td>Yves DeClerck MD and Mary Aalto</td>
</tr>
<tr>
<td>Monday, December 2, 2024</td>
<td>Module 6</td>
<td>Cancer Care</td>
<td>Y. DeClerck MD</td>
<td>Submodule 5</td>
<td>Visit at USC-NCCC 6:00 - 7:30 PM</td>
<td>Yves DeClerck MD</td>
</tr>
<tr>
<td>Friday, December 6, 2024</td>
<td>Module 6</td>
<td>Cancer Care</td>
<td>Y. DeClerck MD</td>
<td>Submodule 5</td>
<td>Visit at USC-NCCC 6:00 - 7:30 PM</td>
<td>Yves DeClerck MD</td>
</tr>
<tr>
<td>Wednesday, December 11, 2024</td>
<td>Module 6</td>
<td>Cancer Care</td>
<td>Y. DeClerck MD</td>
<td>Submodule 5</td>
<td>Visit at USC-NCCC 6:00 - 7:30 PM</td>
<td>Yves DeClerck MD</td>
</tr>
<tr>
<td>Monday, December 16, 2024</td>
<td>Final Exam</td>
<td>Final Exam Students’ Oral Presentations</td>
<td>Y. DeClerck</td>
<td>Final Exam Students’ Oral Presentations</td>
<td>Y. DeClerck</td>
<td></td>
</tr>
</tbody>
</table>