

**Harvard Medical School**  
**Biological and Biomedical Sciences**

**CB212 Biology of the Cancer Cell: From Molecular Mechanisms to Therapeutic Implications**

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**Course Code:** CB (Cell Biology) 212  
**Course Offering:** Spring 2019  
**Course Dates:** January 28, 2019 – May 1, 2019  
**Meeting Dates:** Mondays & Wednesdays  
**Meeting Time:** 12:30-2:00 pm  
**Location:** Lecture: TMEC 106, L-007, 333  
Student Presentations: TMEC 443, 445

**Course Director:** David Frank, MD, PhD (David\_Frank@dfci.harvard.edu)

**Discussants:** Rizwan Haq (Rizwan\_Haq@dfci.harvard.edu)  
Julie Losman (JulieAurore\_Losman@dfci.harvard.edu)

**Curriculum Fellow:** Ryan Lee (Ryan\_Lee@hms.harvard.edu)

**Course Website:** <https://canvas.harvard.edu/courses/55953>

**Course Description:** This semester long course takes a molecular approach to examine the basis of human cancer. The main concepts that we will cover include: cancer genetics and epigenetics, tumor suppressor genes and oncogenes, signal transduction, DNA damage and repair, angiogenesis, metastasis and invasion, apoptosis, cancer stem cells, and tumor immunology and immunotherapy. Lectures will be delivered by experts in the various fields to provide an integrated perspective on past, current and future approaches in cancer biology research. Many of the lecturers are also clinical oncologists and hematologists, who will provide insight into how molecular advances are impacting patient care now, and are likely to do so in the future. In addition, students will participate in workshops in which they will delve more deeply into the primary literature of several of these topics.

**Course Evaluation:**

Participation 20%  
Student Presentation / Workshop 40%  
Brief Research Proposal 40%

**Important Notes:**

- We expect you to attend all lectures and student sessions. Please be on time.
- We want to make this a dynamic learning experience and encourage you to ask questions.
- Lecture notes and readings will be listed on the course website.

## CB212 Biology of the Cancer Cell: From Molecular Mechanisms to Therapeutic Implications

### Tentative Schedule - Spring 2019

Class	Date	Faculty	Topic/Lecture Title	Room
1	Mon Jan 28	David Frank	Course Intro	106

#### Part I: Genetic Aberrations in a Cancer Cell

2	Wed Jan 30	Matthew Meyerson	Cancer Genomics - Applications	L-007
3	Mon Feb 4	William Kaelin	Tumor Suppressors & Oncogenes	L-007
4	Wed Feb 6	Huma Rana	Cancer Genomics - Clinical	L-007
5	Mon Feb 11	Frank Slack	microRNAs	333
6	Wed Feb 13	Matt Freedman	Epigenetics	L-007
	<i>Mon Feb 18</i>	<i>Presidents' Day</i>		
7	Wed Feb 20	Alan D'Andrea	DNA Damage & Repair	L-007
8	Mon Feb 25	Student Workshops		
9	Wed Feb 27	Student Workshops		

#### Part II: Signaling Pathways in a Cancer Cell

10	Mon Mar 4	Rizwan Haq	Intro to Signaling and Cancer	L-007
11	Wed Mar 6	Alice Shaw	ALK pathway and Resistance in Cancer	L-007
12	Mon Mar 11	Kevin Haigis	RTKs and Ras pathway	L-007
13	Wed Mar 13	Alex Toker	PI3 kinase pathway	L-007
	<i>Mon Mar 18</i>	<i>Spring Break</i>		
	<i>Wed Mar 20</i>	<i>Spring Break</i>		
14	Mon Mar 25	Jon Aster	Notch Signaling	L-007
15	Wed Mar 27	Student Workshops		
16	Mon Apr 1	Student Workshops		

#### Part III: Cellular & Organismal Perspectives on Cancer

17	Wed Apr 3	Carla Kim	Cancer Stem Cells	333
18	Mon Apr 8	Matthew Vander Heiden	Cancer Cell Metabolism	L-007
19	Wed Apr 10	Loren Walensky	Cancer Cell Apoptosis	L-007
	<i>Mon Apr 15</i>	<i>Patriot's Day</i>		
20	Wed Apr 17	Sandy McAllister	Metastasis	333
21	Mon Apr 22	Cathy Wu	Tumor Immunology and Immunotherapy	333
22	Wed Apr 24	Student Workshops		
23	Mon Apr 29	Student Workshops		
24	Wed May 1	Eli Van Allen	Precision Medicine	333

## Assessments:

### ▪ **Student Workshop –**

Students will read research papers selected by course faculty that represent the cutting edge in the field and will take turns presenting these papers in a small group setting. These presentation workshops are to be in a journal club style.

### ▪ **Brief Research Proposal –**

Students will be asked to submit a brief, focused written research proposal related to the topic you presented for your workshop, and should reflect the input and feedback you received. The written research proposal will be due 2 weeks after your presentation at a student workshop.

## Academic Integrity

All work in this course is governed by the academic integrity policies of GSAS

(<https://gsas.harvard.edu/codes-conduct/academic-integrity>) and HMS

(<https://mastersstudenthandbook.hms.harvard.edu/409-academic-dishonesty-and-plagiarism>).

It is the students' responsibility to be aware of these policies and to ensure that their work adheres to them both in detail and in spirit. Unless otherwise specified by the instructor, the assumption is that all work submitted must reflect the student's own effort and understanding. Students are expected to clearly distinguish their own ideas and knowledge from information derived from other sources, including from collaboration with other people. If you have a question about how best to complete an assignment in light of these policies, ask the instructor for clarification.

## Reasonable Accommodations

As an institution that values diversity and inclusion, our goal is to create learning environments that are usable, equitable, inclusive and welcoming. Harvard University complies with federal legislation for individuals with disabilities and offers reasonable accommodations to qualified students with documented disabilities and temporary impairments. To make a request for reasonable accommodations in a course, students must first connect with their local disability office. The primary point of contact for GSAS students is the Accessible Education Office ([www.aeo.fas.harvard.edu](http://www.aeo.fas.harvard.edu)). The HMS Director of Disability Services, Timothy Rogers ([timothy\\_rogers@hms.harvard.edu](mailto:timothy_rogers@hms.harvard.edu)) is another potential source of accommodation information for PhD students and is the primary contact for MD and master's students.

Accommodations are determined through an interactive process and are not retroactive. Therefore, students should contact their local disability office as soon as possible, preferably at least two weeks before accommodations are needed in a course. Students are strongly encouraged to discuss their access needs with their instructors; however, instructors cannot independently institute individual accommodations without prior approval from the disability office. Student privacy surrounding disability status is recognized under FERPA. Information about accommodations is shared on a need-to-know basis, and with only those individuals involved in instituting the accommodation.

### **Academic and other Support Services**

We value your well-being and recognize that as a graduate student you are asked to balance a variety of responsibilities and potential stressors: in class, in lab, and in life. If you are struggling with experiences either in- or outside of class, there are resources available to help. Jackie Yun, the GSAS Director of Student Services (617-495-5005) is available to assist students navigating academic or personal difficulties and to connect students to university resources. HILS PhD students have access to free academic tutoring which can be arranged through the DMS office. A variety of academic support services are also available to GSAS students through the Bureau of Study Counsel (<https://bsc.harvard.edu/>) and the Center for Writing and Communicating Ideas (<https://gsas.harvard.edu/center-writing-and-communicating-ideas>).

**All students have access to Counseling and Mental Health Services (CAMHS)** available in Longwood, Cambridge or remotely via webcam or phone. The use of CAMHS is included in the student health fee, regardless of insurance, at no additional cost. More information is available at <https://camhs.huhs.harvard.edu> or by calling the main office at 617-495-2042. Urgent care can be reached 24/7 at 617-495-5711.