

CONCEPTS IN CANCER BIOLOGY (CAMB 512) OVERVIEW AND SYLLABUS

Fall 2023
10:15 – 11:45
Thursdays, BRB 701

COURSE GOALS: Introduce fundamental principles and emerging concepts in cancer biology. Develop conceptual mastery for how these principles and concepts were shaped through experimentation, as well as their implications, limits, and caveats. Hone your ability to identify key experiments and messages within primary literature and lead a group discussion.

COURSE DESCRIPTION: The course is divided into 6 thematic blocks: *Cancer Biology*, *Genome Integrity*, *Cancer Genomics*, *Stress Responses and Metabolism*, *Tumor Microenvironment*, and *Cancer Treatment*. Each meeting will showcase a faculty member lecture that highlights historical experimental breakthroughs and emerging concepts in the indicated field. Lectures will run for 45 minutes followed by a 20-minute student led presentation of a primary research paper and 10-15 minute discussion.

READING ASSIGNMENTS: Two-weeks prior to their lecture, faculty will assign a review that provides relevant background as well as a primary research paper that will be presented by a designated student and discussed by all. The faculty will also provide two discussion questions on the paper. **EVERYONE IS REQUIRED** to read these materials before each lecture.

STUDENT PRESENTATIONS: The presentation should be less than 20 min. Students should prepare slides that:

- 1) Set the stage for the work done in the paper,
- 2) Review the key experimental approaches and methods used,
- 3) Highlight the most critical discovery(ies) of the paper.

DISCUSSION: Two designated students (not the presenter) will lead the discussion after the paper is presented; one for each question. The discussion should initially be centered on the question provided by the faculty and the discussion leader's role is to begin the discussion and help moderate it. We welcome additional points of discussion provided by discussion leaders and are happy to follow whatever tangents that arise. The total discussion portion is less than 20 minutes.

COURSE GRADE: The course grade will be based on 75% participation, 25% presentations.

DISSEMINATION of INFORMATION: All communication will happen over Slack.

COURSE DIRECTORS:

Bobby Bowman, Robert.Bowman@Pennmedicine.upenn.edu
David Feldser, dfeldser@upenn.edu

THEME I: CANCER BIOLOGY

Thur, Aug 31	Course Introduction	All Directors
Thur, Sep 7	Hallmarks of Cancer	Brian Keith
Thur, Sep 14	Oncogenes and Tumor Suppressors	David Feldser
Thur, Sep 21	Growth Signaling Pathways	George Burslem
Thur, Oct 5	Developmental Pathways	Ben Stanger
Thur, Oct 12	Tumor progression and metastasis	Qing Chen

THEME II: GENOME INTEGRITY

Thur, Oct 19	DNA maintenance/damage/repair	Roger Greenberg
Thur, Oct 26	Epigenetics of Cancer: Histone modification	Thomas De Raedt
Thur, Nov 2	Epigenetics of Cancer: DNA/RNA methylation	Kathrin Bernt
Thur, Nov 9	Nuclear mechano-transduction	Guilherme Nader

THEME III: CANCER GENOMICS

Thur Nov 16	Single cell genomics	Bobby Bowman
Thur, Nov 23	No Class (Thanksgiving Break)	
Thur, Nov 30	Intro to Cancer Genomics I	Peter Choi
Thur, Dec 7	Functional Genomics- Precision Oncology	David Schultz
Thur, Dec 14	Intro to Cancer Genomics II-workshop	Peter Choi