

Carcinogenesis, Fall 2015

ANIMLSCI 697C (Course#40267)

Lectures are on Tu/Th, 1-2:15 pm

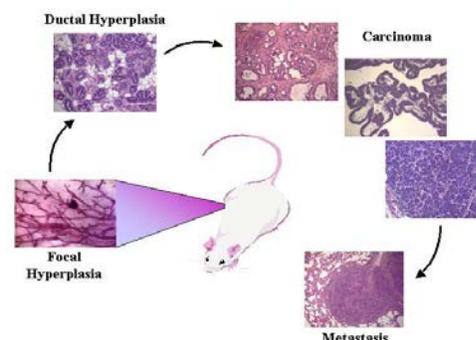
Location: Integrated Sciences Building, Room 321

Weekly discussion sessions will be held in the ISB conference rooms. Time and location will be determined.

Instructors:

D. Joseph Jerry (ISB427P),

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1. Course description

We will cover changes in the prevalence of cancer and contemporary diagnostics and treatments. While these have dramatically decreased mortality, cancer continues to claim more than 585,000 lives annually. Therefore, the focus will be on the mechanisms that are corrupted in cancer cells and the differences in vulnerability among tissues, the technologies used to define pathways and lessons learned. Equally important are the strategies being used to exploit the vulnerabilities of tumors for personalized and targeted therapeutics.

PREREQUISITES: Students must have graduate status or instructor's permission. Students are expected to have completed courses in Molecular and Cellular Biology (Animlsci200, Biol285 or Biochem275) and Genetics (Animlsci311 or Bio283) with a grade of "C" or better.

2. Instructional goals:

The focus of the course is to develop independence in critical thought related to the tools available for studying cancer mechanisms. Experimental design will be emphasized. Lectures will provide overarching concepts. Discussion sessions will be used to consider proposals by the students in response to specific studies of carcinogenesis and cancer. Collaborative learning will be encouraged for completion of out of class assignments. Exams will provide the

3. Textbook:

The Biology of Cancer, 2nd Edition; Author(s): Robert A. Weinberg; ISBN: 9780815342205

Primary research articles will also be assigned as required readings. These will be provided electronically to students through MOODLE.

4. Evaluation and Grading:

The exams will be based on the topics reviewed in class and will assess students' understanding of literature related to cancer biology as well as their ability to apply the experimental approaches to address critical questions.

- 30% Class participation, quizzes and homework
- 20% Exam 1 --- Lectures 1-8
- 20% Exam 2 --- Lectures 9-15
- 30% Final Exam --- Comprehensive (lectures 1-25) for the course material. If the grade on the final exam is higher than a mid-semester hour exam, the lower grade will be dropped and the final will be 60% of the final grade.

4. Class schedule for Fall 2015

#	Date	Instructor	Topic
1	Tu, Sept 8	Joseph Jerry	Overview of cell biology & genetics (Weinberg, Chapter 1)
2	Th, Sept 10	Joseph Jerry	Chemical carcinogenesis (Weinberg, Chapter 2)
3	Tu, Sept 15	Joseph Jerry	Retroviruses & oncogenes (Weinberg, Chapter 3)
4	Th, Sept 17	Joseph Jerry	Cellular proto-oncogenes & signaling (Weinberg, Chapter 4-6)
5	Tu, Sept 22	Joseph Jerry	Tumor suppressor genes (Weinberg, Chapter 7)
6	Th, Sept 24	Joseph Jerry	Cell cycle regulation (Weinberg, Chapter 8)

7	Tu, Sept 29	Joseph Jerry	Animal models --- testing molecular pathways; Mutations in human cancers --- COSMIC database
8	Th, Oct 1	Joseph Jerry	Exam 1
9	Tu, Oct 6	Joseph Jerry	Cancer statistics
10	Th, Oct 8	Katherine Reeves	Introduction to epidemiology
	Tu, Oct 13	No Class	Monday class schedule
11	Th, Oct 15	Joseph Jerry	Introduction to pathology
12	Tu, Oct 20	Leonid Pobezinsky	Immune system and cancer
13	Th, Oct 22	Leonid Pobezinsky	Introduction to immunology
14	Tu, Oct 27	Leonid Pobezinsky	Tumorigenesis in the immune system
15	Th, Oct 29	Leonid Pobezinsky	Tumor immunology and cancer immunotherapies (Weinberg, Chapter 15)
16	Tu, Nov 3	Leonid Pobezinsky	Inflammation and cancer
17	Th, Nov 5	Joseph Jerry	Exam 2
18	Tu, Nov 10	Nagendra Yadava	Cellular metabolic pathways and cell proliferation
19	Th, Nov 12	Nagendra Yadava	Cancer cell metabolic alterations- cause or consequence?
20	Tu, Nov 17	Joseph Jerry	Inherited cancer susceptibility
21	Th, Nov 19	Joseph Jerry	Cancer subtypes
22	Tu, Nov 24	Joseph Jerry	Stem cells and cancer stem cells
	Th, Nov 26	No Class	Thanksgiving break
23	Tu, Dec 1	Joseph Jerry	Contemporary chemotherapy
24	Th, Dec 3	Joseph Jerry	Emerging therapies --- Targeted delivery
25	Tu, Dec 8	Joseph Jerry	Emerging therapies --- Synthetic lethal approaches
26	Th, Dec 10	Joseph Jerry	Review
	Dec 11-12		Reading Period
	TBD		Final Exam (Comprehensive)

5. Learning objectives

The epidemiology of cancers will be considered to provide the context and the factors that contribute to carcinogenesis. The course will provide an introduction to the mechanisms underlying carcinogenesis. This will include the experimental approaches and interpretations. The pathogenesis and mechanisms for hematological cancers and solid tumors will be considered in depth. This will provide a comparative approach to understand the differences in mechanisms and signaling. Differences in inherited predisposition to these tumor types will also emphasize the distinct pathways. Finally, contemporary and emerging therapies will be reviewed.

6. Academic honesty policy

(URL: http://www.umass.edu/dean_students/downloads/AcademicHonestyPolicy.pdf)

Since the integrity of the academic enterprise of any institution of higher education requires honesty in scholarship and research, academic honesty is required of all students at the University of Massachusetts Amherst. Academic dishonesty is prohibited in all programs of the University. Academic dishonesty includes but is not limited to: cheating, fabrication, plagiarism, and facilitating dishonesty. [See Appendix B for detailed examples of behavior that constitutes academic dishonesty.] Appropriate sanctions may be imposed on any student who has committed an act of academic dishonesty. Instructors should take reasonable steps to address academic misconduct. [See Appendix C for some suggested ways to deal with issues of academic integrity.] Any person who has reason to believe that a student has committed academic dishonesty should bring such information to the attention of the appropriate course instructor as soon as possible. Instances of academic dishonesty not related to a specific course should be brought to the attention of the appropriate department Head or Chair. The procedures outlined below are intended to provide an efficient and orderly process by which action may be taken if it appears that academic dishonesty has occurred and by which students may appeal such actions. Since students are expected to be familiar with this policy and the commonly accepted standards of academic integrity, ignorance of such standards is not normally sufficient evidence of lack of intent.