

# Carcinogenesis, Fall 2017

## ANIMLSCI 697C (Course#34529)

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

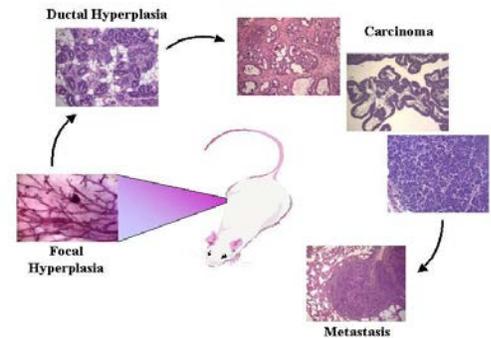
Location: Morrill 1 North 448

Required discussion on Th, 5-6 pm; location TBA

### Instructors:

D. Joseph Jerry (ISB427P),

Email: [jjerry@vasci.umass.edu](mailto:jjerry@vasci.umass.edu), Tel: x55335



### 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. Students are expected to have completed courses in Cell Biology, Molecular Genetics, Endocrinology and Biochemistry.*

### 2. Instructional goals:

Lectures will provide overarching concepts and mastery will be evaluated in written exams. Weekly discussion sessions will be used to develop independence in critical consideration of topics related to current controversies in cancer biology and the tools for studying cancer mechanisms. Collaborative learning will be encouraged for completion of out of class assignments. Experimental design will be emphasized. Topics to be addressed include: (i) role of stem cells in cancer risk; (ii) EMT and metastasis; (iii) cancer immunology; (iv) cancer models.

### 3. Textbook:

The Biology of Cancer, 2<sup>nd</sup> 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.

### Additional Resources:

Cancer Concepts: A Guidebook for the Non-Oncologist. Editors: Richard S. Pieters, MD and James Liebmann, MD; Associate Editor: Maryann Bishop-Jodoin, MEd; Assistant Editors: Jean Boucher, PhD, RN, NP; Andrew Chen, MD; Ediz Cosar, MD; Lisa A. Palmer, MSLS; Patricia Webster, MS, RT(T). Established by the Department of Radiation Oncology and the Department of Medicine, Division of Hematology Oncology at the University of Massachusetts Medical School

[http://escholarship.umassmed.edu/cancer\\_concepts/](http://escholarship.umassmed.edu/cancer_concepts/)

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

*Please note that lecture slides placed on MOODLE are the property of the instructors are not to be posted on secondary websites or otherwise shared without their consent. This violates copyright laws as well as the academic honesty code. Violators are subject to expulsion.*

### 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
- 20% Exam 2
- 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 50% of the final grade.

#### 4. Class schedule for Fall 2015

#	Date	Instructor	Topic
1	Tu, Sept 5	Joseph Jerry	Review and background on cancer
2	Th, Sept 7	Katherine Reeves	Introduction to epidemiology (assigned readings)
3	Tu, Sept 12	Joseph Jerry	Cancer statistics (assigned readings)
4	Th, Sept 14	Joseph Jerry	Chemical carcinogenesis --- endogenous & exogenous mutagens (Chapter 2, pp 60-66; Chapter 11, pp 480-484)
	Mon, Sept 16		Last day for Add/Drop
5	Tu, Sept 19	Joseph Jerry	Viral oncogenes (Chapter 3)
6	Th, Sept 21	Joseph Jerry	Cellular oncogenes (Chapter 4)
7	Tu, Sept 26	Joseph Jerry	Aberrant signaling in cancer (Chapter 5-6)
8	Th, Sept 28	Joseph Jerry	Tumor suppressors (Chapter 7)
9	Tu, Oct 3	Joseph Jerry	Cell cycle regulation (Chapter 8)
10	Th, Oct 5	Joseph Jerry	<b>Exam 1 (30% of grade)</b>
	<b>Tu, Oct 10</b>	<b>No Class</b>	<b>Monday class schedule</b>
11	Th, Oct 12	Joseph Jerry	Tumor microenvironment --- from monolog to dialog Stem cells and epigenetics
12	Tu, Oct 17	Leonid Pobezinsky	Inflammation and cancer
13	Th, Oct 19	Leonid Pobezinsky	Immune system and cancer
14	Tu, Oct 24	Leonid Pobezinsky	Introduction to immunology
15	Th, Oct 26	Leonid Pobezinsky	Tumorigenesis in the immune system
16	Tu, Oct 31	Leonid Pobezinsky	Tumor immunology and cancer immunotherapies (Chapter 15)
17	Th, Nov 2	Joseph Jerry	Introduction to pathology
18	Tu, Nov 7	Joseph Jerry	Inherited cancer susceptibility syndromes
19	Th, Nov 9	Joseph Jerry	<b>Exam 2 (30% of grade)</b>
20	Tu, Nov 14	Prabin Majhi	DNA repair pathways
21	Th, Nov 16	Prabin Majhi	Genomic landscape of cancers
	<b>Nov 21, 23</b>	<b>No Class</b>	<b>Thanksgiving break</b>
22	Tu, Nov 28	Nagendra Yadava	Cellular metabolic pathways and cell proliferation
23	Th, Nov 30	Nagendra Yadava	Cancer cell metabolic alterations- cause or consequence?
24	Tu, Dec 5	Joseph Jerry	Contemporary chemotherapy
25	Th, Dec 7	Joseph Jerry	Emerging therapies --- Targeted delivery & Synthetic lethal approaches
	Tu, Dec 12	Joseph Jerry	Review
	Dec 13		Reading Period
	TBD		<b>Final Exam (Comprehensive, 35% of grade)</b>

#### 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](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.