

GMS 6338: Recent Advances in Cancer Metastasis
Spring 2016

Class Meetings:	Module 3, Mondays & Thursdays 2:00pm-4:00pm
Class Location:	Cancer Genetics Research Complex (2033 Mowry Road) Room 291 (Monday) Room 391 (Thursday)
Credit Hours:	1 credit (two 2-hour sessions per week for 4 weeks)
Course Directors:	Lizi Wu, PhD and Jianrong Lu, PhD
Office Hours:	TBD
Office:	CGRC Room 362 (Wu) and Room 357 (Lu)
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Website:	TBD

COURSE DESCRIPTION

Cancer metastasis is the process in which tumor cells spread from their primary sites to distant organs. It is the leading cause of death from cancer and has emerged as a critical and important field of cancer research. Although our understanding of molecular events that regulate cancer metastasis has improved significantly, the metastatic process remains poorly defined due to the complicated, dynamic nature of host and tumor interactions and limited research tools and models. This course will cover the recent progress in cancer metastasis including the interactions between tumor cells and host environments at molecular and cellular levels during metastatic process as well as tools and models available for cancer metastasis research. This course is targeted at graduate students interested in cancer research (e.g., Genetics and Genomics, Biology, IDP).

COURSE OBJECTIVES

The goal is to acquaint students with knowledge and approaches as well as limitations in current cancer metastasis research. Students are expected to gain a general knowledge on molecular and cellular regulation of tumor cells and tumor cell-microenvironment interactions during the process of cancer metastasis as well as to learn about the advantages and limitations of various approaches that are currently used in the cancer metastasis research.

COURSE PROCEDURE

This course is intended to provide students with a broad overview of cancer metastasis and available approaches for cancer metastasis research. The class format will be a one-hour lecture followed by one-hour presentation and discussion of a recent paper relevant to the lecture topics.

STUDENT COURSE REQUIREMENTS

The following will be used to assess students' progress in achieving the course objectives:

1. **Attendance and participation.** Each student is expected to read the assigned papers prior to class, and be an active and regular participant in class discussions.
2. **Presentation.** Each student is expected to present once on selected paper(s) to the rest of the class pertaining to the topic that is covered on the same date. The presentation will address background and significance, specific research problems that are addressed, approaches, results, conclusions, and future research directions. Strengths and limitations of approaches and data will be evaluated.

EVALUATION AND GRADING

Grades will be based on attendance and participation in discussions (50%) and paper presentation (50%).

TEXTBOOK AND READINGS

No textbook is required. Weekly assigned journal research articles and reviews will be used for reading and discussion. Please check the course website for specific readings and dates.

TOPICAL OUTLINE

Session 1. Overview for tumor metastasis: seed and soil and beyond.

Session 2. Tumor heterogeneity and cancer stem cells/initiating cells

Session 3. Epithelial-mesenchymal transition (EMT): intrinsic regulation and tumor microenvironment

Session 4. Circulating tumor cells (CTC), micro-metastasis, and cancer dormancy

Session 6. Tumor metabolism (glycolysis, redox, hypoxia, autophagy)

Session 5. Pre-metastatic niche and organ-specific metastasis

Session 7. Key signaling pathways in tumor metastasis

Session 8. Epigenetic regulation of tumor metastasis.