

IMPORTANT: This syllabus form should be submitted to OAA (gsbs_academic_affairs@uth.tmc.edu) a week before the start of each semester.

NOTE to STUDENTS: If you need any accommodations related to attending/enrolling in this course, please contact the Graduate School's 504 Coordinator Natalie Sirisaengtaksin, PhD. We ask that you notify GSBS in advance (preferably at least 3 days before the start of the semester) so we can make appropriate arrangements.

Term and Year: Fall 2026 Course Number and Course Title: GS04 1093: Biology of Cancer Metastasis Credit Hours: 3 hours Prerequisites: None Meeting Location: UT-MD Anderson Cancer Center Building/Room#: BSRB S3.8367 (GSBS Gallick Classroom)	Program Required Course: No Approval Code: No Audit Permitted: Yes Classes Begin: Tuesday, September 1, 2026 Classes End: Thursday, December 3, 2026 Final Exam Week: FINAL EXAM EMAILED DEC 3: DUE BY DECEMBER 10, 2026, 10 AM
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Class Meeting Schedule

Day	Time
T/Th	3:30-5:00pm

Course Director Name and Degree: Daniel Frigo, PhD Title: Professor and Deputy Chair Department: Cancer Systems Imaging Institution: MDACC Email Address: Frigo@mdanderson.org Contact Number: 713-563-9673 Course Co-Director: Name and Degree: Dung-Fang Lee, PhD Title: Associate Professor (CPRIT Scholar in Cancer Research) Department: Integrative Biology and Pharmacology Institution: UTHH Email Address: Dung-Fang.Lee@uth.tmc.edu Contact Number: 713-500-6132 NOTE: Office hours are available by request. Please email me to arrange a time to meet.	Instructors Daniel Frigo, PhD Institution: MDACC Email Address: Frigo@mdanderson.org Guocan Wang, PhD Institution: MDACC Email Address: GWang6@mdanderson.org Fraser Symmans, MB, ChB Institution: MDACC Email Address: FSymmans@mdanderson.org Guillermina Lozano, PhD Institution: MDACC Email Address: GGLozano@mdanderson.org Nicholas Navin, PhD Institution: MDACC Email Address: NNavin@mdanderson.org Junchen Liu, PhD Institution: UTHealth Email Address: Junchen.Liu@uth.tmc.edu
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23. Florencia McAllister, MD

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Course Description:

A didactic introductory level course entirely dedicated to the study of the cellular biological processes that underpin cancer metastasis. This course will cover basic, translational, and clinical knowledge, with specific emphases on the metastatic cascade: seed and soil hypothesis, organ-specific metastasis, cell cycle and metastasis, multiple therapies for various metastatic cancers, and will address the process of taking basic research to the clinic ('bench-to-bedside') for major metastatic human cancers.

This is a prerequisite course for cancer biology students in the cancer discovery track.

Textbook/Supplemental Reading Materials

- Original research articles assigned by faculty instructors.
- Not mandatory, but recommended text is "The Biology of Cancer" by Robert A. Weinberg

Course Objective/s:

Dissect the mechanisms controlling cancer progression from the primary tumor site into the circulation and seeding distant organs.

At the conclusion of this course, students should have an understanding of: 1) how malignant tumors begin, 2) preclinical methods used to study metastasis, 3) how the disease evolves genetically, epigenetically, and metabolically, 4) how disseminated cancer cells can go undetected, 5) the roles of host-modifiable factors and the immune system in metastasis, and 6) how metastatic cancers are being monitored and targeted in the clinic.

This course is also dedicated to improving trainees' skills in critical reading, writing, and presenting cancer research.

Specific Learning Objectives:

1. To understand the steps in metastasis development and the role of tumor heterogeneity in the metastasis process.
2. To understand the role of the tumor microenvironment in promoting metastasis.
3. To understand cell cycle and metastasis.
4. To understand the molecular mechanisms of migration and invasion and angiogenesis as they relate to circulating tumor cells and disseminated tumor cells and their roles in metastasis.
5. To understand current treatment of metastasis - Conventional therapies and lessons from genomic sequencing.

Student responsibilities and expectations:

This course is designed to help students build a knowledge base that allows them to develop their scientific analytical and communication skills. Students will be evaluated on the basis of basic concept tests (60% total: 20%/test (3 exams), a group presentation/student seminar (20%) and overall participation (20%).

Grading System: **Letter Grade (A-F)**

Student Assessment and Grading Criteria:

Percentage	Description
Presentation (20 %)	Students will team together (~2 students/group) to present on a pre-selected paper. Presentations will include the background/rationale for the study, hypothesis, approach, conclusions and overall strengths and weaknesses of the study as well as perceived overall impact. The leading faculty and 1-2 additional students scheduled for each student seminar will lead the follow-up discussion.
Exams (60%)	Students will be tested on the principles of metastasis. These will be take-home tests based on material from the lecturers and any assigned readings.
Participation and/or Attendance (20%)	For student seminars (the journal club), the non-presenting students should also read the paper and come prepared. Students may be called upon at random to discuss the hypothesis, the strategy used to examine this hypothesis, the experiments described in each figure, and the conclusion. In addition, attendance to lectures and interactions with the lecturers will also be taken into consideration.

Scale: 100-90% A; 89.9-80% B; 79.9-70% C; 69.9-60% D; < 60% F

CLASS SCHEDULE

Date	Duration (Hour(s) taught by lecturer)	Lecture Topic	Lecturer/s
Tuesday, September 1	1.5	Introduction to Metastasis	Dr. Daniel Frigo
Thursday, September 3	1.5	Genetics of Metastasis	Dr. Guillermina Lozano
Tuesday, September 8	1.5	The Pathology of Metastasis	Dr. Fraser Symmans
Thursday, September 10	1.5	Mouse Models of Metastasis	Dr. Guocan Wang
Tuesday, September 15	1.5	The Metastatic Niche	Dr. Dihua Yu
Thursday, September 17	1.5	Student Seminars	Dr. Junchen Liu
Tuesday, September 22	1.5	Tumor Evolution and Metastasis	Dr. Nicholas Navin
Thursday, September 24	1.5	Student Seminars	Dr. Dung-Fang Lee
Tuesday, September 29	1.5	Student Seminars	Dr. Eleonora Dondossola
		FIRST EXAM EMAILED: DUE BY OCT 6, 2026, 10 AM	
Thursday, October 1	1.5	Epithelial-Mesenchymal Transition	Dr. Loukia Karacosta
Tuesday, October 6	1.5	FLEX – Nature Conference	
Thursday, October 8	1.5	Role of Immune Cells in Metastasis	Dr. Xi Chen
Tuesday, October 13	1.5	Student Seminars	Dr. Di Zhao
Thursday, October 15	1.5	FLEX	
Tuesday, October 20	1.5	lncRNAs and Metastasis	Dr. George Calin
Thursday, October 22	1.5	Student Seminars	Dr. Shabnam Shalapour
Tuesday, October 27	1.5	miRNAs and Metastasis	Dr. Li Ma
Thursday, October 29	1.5	Cancer Metastasis Metabolism	Dr. Daniel Frigo
		SECOND EXAM EMAILED: DUE BY NOV 5, 2026, 10 AM	
Tuesday, November 3	1.5	Minimal Residual Disease & Dormancy	Dr. Jeff Rosen
Thursday, November 5	1.5	Student Seminars	Dr. John Hagan
Tuesday, November 10	1.5	FLEX	
Thursday, November 12	1.5	Role of the Microbiome in Metastasis	Dr. Florencia McAllister

Tuesday, November 17	1.5	Immunotherapy	Dr. James Allison
Thursday, November 19	1.5	Imaging of Cancer Metastasis	Dr. David Piwnica-Worms
Tuesday, November 24	1.5	Waterfall chat on metastasis research: What's next?	Dr. Ronald DePinho
Thursday, November 26		NO CLASS -- THANKSGIVING	
Tuesday, December 1	1.5	CTCs and ctDNA in cancer prognosis and treatment	Dr. Anthony Lucci
Thursday, December 3	1.5	Treatment Options for Metastasis	Dr. John Heymach
		FINAL EXAM EMAILED: DUE BY DECEMBER 10, 2026, 10 AM	

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