

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 one of the Graduate School's 504 Coordinators, Cheryl Spitzenberger or Natalie Sirisaengtaksin. 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.

<p>Term and Year: Fall 2024</p> <p>Course Number and Course Title: GS04 1213: Mechanisms in Cancer Therapeutics</p> <p>Credit Hours: 3</p> <p>Meeting Location: BSRB S3.8367, (GSBS, Gallick Classroom)</p> <p>Building/Room#: MDACC, Basic Science Rsch. Bldg.</p> <p>WebEx/Zoom Link: TBD</p>	<p>Program Required Course: No</p> <p>Approval Code: No</p> <p>Audit Permitted: Yes</p> <p>Classes Begin: Monday August 26, 2024</p> <p>Classes End: Friday, December 6, 2024</p> <p>Exams: Oct. 9, 2024 (Module 1) Nov. 11, 2024 (Module 2) Dec. 11, 2024 (Module 3)</p>
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Class Meeting Schedule

Day	Time
Mon, Wed, Fri	2:00 pm – 3:00 pm

<p>Course Director:</p> <p>Name and Degree: Federica Pisaneschi, PhD</p> <p>Title: Assistant Professor</p> <p>Department: Institute of Molecular Medicine</p> <p>Institution: UTHH</p> <p>Email Address: Federica.Pisaneschi@uth.tmc.edu</p> <p>Contact Number: 713-500-5583</p> <p>NOTE: Office hours are available by request. Please email me to arrange a time to meet.</p> <p>Teaching Assistant:</p> <p>None Name and Email Address</p>	<p>Instructors: (See attached class schedule)</p> <p>1. Name and Degree Institution: Email Address:</p> <p>2. Name and Degree Institution: Email Address:</p> <p>3. Name and Degree Institution: Email Address:</p>
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Course Description:

This course will establish a foundation of the principles of cancer therapy, including pharmacologic rationales, consideration of biological targets, and mechanism-based approaches to combinations. A major emphasis will be placed on agents that damage DNA, and the response of tumor cells to such insults. In-depth presentations will consider all classes of chemotherapeutic agents, their metabolism, and mechanisms of action, and the resistance mechanisms of tumor cells. Mechanistic rationales for other therapeutic modalities used for cancer treatment such as radiotherapy, gene therapy, and immunotherapy will also be covered. Students will have the opportunity to learn to identify novel therapeutic targets, and the procedures used to develop new agents for clinical evaluation.

Textbook/Supplemental Reading Materials:

Reference Book: **Cancer Chemotherapy and Biotherapy: Principles and Practice, by Bruce A. Chabner, MD, Dan L. Longo, MD**

Course Objectives: Upon successful completion of this course, students will...

1. Learn the mechanisms of action of chemotherapeutic drugs that target DNA replication, transcription, alternative splicing, translation, mitosis, cell cycle, ribonucleotide reductase, folate metabolism, and nucleosides.
2. Learn different ways in which immunologic components can be used in the treatment and prevention of malignancy.
3. Learn how cancer-associated signaling pathways can be targeted and how cells adapt and generate resistance mechanisms.
4. Learn the mechanisms of action of agents that directly damage DNA, how different types of DNA damage are repaired, how cells respond to DNA damage, and how this process can be targeted for therapeutic intent.
5. Learn the interactions of tumor cells with their microenvironment and how this can be targeted for therapeutic intent.

Student Responsibilities and Expectations:

1. Read, process, and review (study) material provided by the lecturers
2. Read research articles (e.g., primary research) when suggested by lecturers
3. Prepare for and take course quizzes based on course lectures/ readings.
4. Participate in and contribute to course discussions during lecture, review sessions
5. Prepare for and take a final examination based on lecture and some reading material

Students are expected to complete all assigned reading material (reviews and research literature) prior to class. While you may work and discuss all course materials and assignments in groups, all writing assignments must be your own. Plagiarism and failure to properly cite scientific literature and other sources will not be tolerated and are grounds for dismissal from the course and further GSBS disciplinary action. Cheating or engaging in unethical behavior during examinations (quizzes and final) will be grounds for dismissal from the course without credit and further GSBS disciplinary action.

Grading System: Letter Grade (A-F)	
Student Assessment and Grading Criteria : <i>(May include the following:)</i>	
Percentage	Description
Homework (40 %)	3 Take Home assignments (2 Essay questions each)
Exams (50 %)	3 MCQs in class exams
Participation/Attendance (10%)	>85% class attendance/participation

CLASS SCHEDULE: *(See attached tentative schedule. Please note that the faculty assigned to teach the lecture may still be changed.)*

Date	Duration (Hour(s) taught by lecturer)	Lecture Topic	Lecturer/s
		SEE FILE	

NOTE: Lecturers will provide their talks' slides before the lecture takes place. Lecturers will be asked to provide reading material relevant to their topics.

MECHANISMS IN CANCER THERAPEUTICS – GS04-1213

FALL SEMESTER 2024

Semester starts on Monday, August 26, 2024
Dates and time Monday, Wednesday and Friday, 2:00 pm – 3:00 pm
Room BSRB S3.8367 Gallick Classroom

Course Requirements:

Reference Book: Cancer Chemotherapy and Biotherapy: Principles and Practice, by Bruce A. Chabner MD, Dan L. Longo MD

<u>Date</u>	<u>Lecture Title</u>	<u>Instructor</u>
<u>Module I</u>		
Cellular Processes, Targeting Cellular Events		
Mon, August 26, 2024	Introduction to Cancer Therapeutics	Phil Jones
Wed, August 28, 2024	Cell Cycle	Majid Momeny
Fri, August 30, 2024	Ribonucleotide Reductase & Deoxynucleotides	Varsha Gandhi
Mon, September 2, 2024	Labor Day Holiday - No Class	
Wed, September 4, 2024	An Introduction to Cancer Epigenetics	Rugang Zhang
Fri, September 6, 2024	Review of 5-Fluorouracil mechanism	Bill Plunkett
Mon, September 9, 2024	Nucleoside Analogs	Varsha Gandhi
Wed, September 11, 2024	Alkylating Agents, Cisplatin and Analogs	Bill Plunkett
Fri, September 13, 2024	Topoisomerase Inhibitors	Bill Plunkett
Mon, September 16, 2024	Targeting Cell Cycle Regulation for Cancer Therapy	Abdullah Osman
ROS & Cell Death:		
Wed, September 18, 2024	Cell Death Mechanisms Enhancement	Joya Chandra
Fri, September 20, 2024	ROS: Generation, Toxicity, & Drug Target	Scott Bright
Radiotherapy, DNA Damage and Repair		
Mon, September 23, 2024	Radiotherapy	Ryan Park
Wed, September 25, 2024	Radioisotopes in Cancer Therapy	Federica Pisaneschi
Fri, September 27, 2024	Radiopharmaceutical therapies	Cheenu Kappadath
Mon September 30, 2024	Synthetic Lethality, PARP inhibition, other strategies	Tim Yap
Wed October 2, 2024	Radiotracers in Molecular Imaging	Federica Pisaneschi
Fri., October 4, 2024	TAP RETREAT	
<u>Module II</u>		
Aberrant Kinases, Receptor Signaling, Tissue Physiology and Angiogenesis		
Mon, October 7, 2024	Introduction of Cell Signaling & RTKs	Varsha Gandhi
Wed, October 9, 2024	Exam I	

Fri, October 11, 2024	Innovation in KRAS Therapeutics	Tim Heffernan
Mon, October 14, 2024	Aurora Kinase Inhibition	Faye Johnson
Wed, October 16, 2024	Angiogenesis	Joe McCarty
Fri, October 18, 2024	Targeting the ER and HER2 Receptor in Breast Cancer	Debu Tripathy
Mon, October 21, 2024	Targeting the leukemia and Solid Tumor Microenvironment	Michael Andreeff
Wed, October 23, 2024	Targeting B Cell Receptor Signaling; Microenvironment	Jan Burger
Fri, October 25, 2024	Targeting PI3K Pathway	Senthil Damodaran
Mon, October 28, 2024	Targeting the Androgen Receptor: Prostate Cancer Applications	Tim Thompson
Wed, October 30, 2024	Targeting Cancer Metabolism	Eyal Gottlieb
Fri, November 1, 2024	Targeting the EGF Receptor	John Heymach
Mon, November 4, 2024	Autophagy	Nancy Gordon
Wed, November 6, 2024	Targeting the MAPK Pathway in melanoma	Rodabe Amaria
Fri, November 8, 2024	Cancer Stem Cells	Lokesh Battula
Mon, November 11, 2024	Exam II	
<u>Module III</u>		
Transcription & Translation		
Wed, November 13, 2024	Epigenetically Directed Cancer Therapeutics	Deepa Sampath
Fri, November 15, 2024	Transcription, Gene Expression and Silencing	Kunal Rai
Mon, November 18, 2024	Protein Ubiquitination; Proteasome Inhibitors; Degrons	Joya Chandra
Wed, November 20, 2024	TP53	Hussein Abbas
Fri, November 22, 2024	Targeting (Bromodomains Extraterminal) Proteins for Leukemia Therapy	Gautam Borthakur
Mon, November 25, 2024	Mitochondrial fission fusion	Gautam Borthakur
Immune Therapies		
Wed, November 27, 2024	NO CLASS	
Fri, November 29, 2022	Thanksgiving Holiday - No Class	
Mon, December 2, 2024	Immunology, Cellular Therapy and Stem Cell Transplant	Gheath Al- Atrash
Wed, December 4, 2024	NK Cell Therapies	May Daher
Fri, December 6, 2024	Checkpoint Inhibition Strategies	Michael Curran
Mon, December 9, 2024	CAR-T cell therapy	Hind Rafei

GS04 1213: Mechanisms in Cancer Therapeutics		
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