

CH391L
Molecular Mechanisms of Genome Maintenance
Unique # 52955

Wednesday 2-5 PM
WEL 3.422
Professor: Finkelstein

Instructor: Dr. Ilya Finkelstein ifinkelstein@cm.utexas.edu

Office Hours: by appointment, office: MBB 3.422

Topics: This course will focus on current developments in understanding the molecular mechanisms of genome maintenance and cancerogenesis. A strong emphasis of the course will be to understand the methods and techniques that have enabled modern breakthroughs in understanding genome stability. The course will rely heavily on primary literature and class presentations.

Prerequisites: Biochemistry (CH339K and CH339L) or equivalent. Undergraduate students must have the instructor's permission to register for this course.

Course web page: The course web site on OpenWetWare (OWW) will be used to complete assignments: <http://openwetware.org/wiki/CH391L/S2013>
Participants will be required to register an account on OWW and learn to edit this Wiki.

Grading: Final grades will be assigned by a straight scale (no curve; 1000 points max) based on how many points you accumulate. Grades will be assigned based on the following rubric:

Topic Presentations:		Points	Grade
• Written Reports (wiki)	400	> 900	A
• Oral Presentations	300	801-900	B
• Participation (Class/Wiki)	300	701-800	C
Total	1000	601-700	D
		< 600	F

Class Structure:

Every two weeks, each student will select an original research article that discusses a key finding that is related to the general themes listed on the "Topics page" below. This article will form the basis of two brief oral reports and a written Wiki-based report.

Written Wiki Report

To prepare for these oral presentations, you are required to complete a written report by creating a new page on the course web site. You should aim for an in-depth discussion of the topic: ~1000 words, ≥3 citations to scientific reviews and research papers, and one or more explanatory figures. This Wiki report should be finished by the day of your first presentation.

Class Time:

Each class time will be split into two halves with a 10-15 minute break between them.

First Presentation — New Topics

In the first half of each class, three-five participants will have 15 to 20 minutes each to individually present the background information that will help everyone else to

understand their original research article. Do not go into details of your selected research article in this presentation.

Presentations should be kept simple. They may contain figures from the literature (with proper attribution) and a verbal description of the background, experimental methods, and future directions in a research area.

Be brief and concise. The PowerPoint presentation should contain no more than ten slides. You are encouraged to follow the outline of your written Wiki report.

Class Participation:

Other members of the class are expected to provide feedback by asking questions during your presentation and by editing the Talk pages for your written Wiki report after your first presentation. Comments should be constructive, with proper citations where applicable. Your classmates will ask you interesting questions or bring up issues that you may not immediately answer. The goal is to help all of us learn from the feedback and revision cycle! You are encouraged (but not required) to bring a laptop / tablet / smart-phone to view Wiki pages and related scientific papers during in-class presentations.

Second Presentation — Topic Updates.

In the second half of the class period, students who presented new topics the previous time will present their answers to questions that were raised during the previous in-class discussion of their topic or on the Wiki talk pages. You may need to add additional citations to research papers to expand on the background.

To keep a record of your changes, you should keep track of your point-by-point responses and the Wiki edits that you made to your written report on your topic's Talk page as if you were responding to reviewers of a scientific paper.

After you present these updates, the entire class will discuss the original research article that you selected two weeks earlier. Everyone in class is expected to be familiar with the details of this paper. **The instructor may ask any person to answer questions about the motivation, methods, experiments, results, implications, etc. when discussing this research paper.**

Topic Choice: Topic choices should be discussed with the instructor at least one week prior to the scheduled presentation. A list of suggested topics is found on the OWW wiki page, but there is significant leeway to tailor the papers and topics toward your specific interests.

The goal of the topic component of the class is to create a reference work that you can come back to after completing the class to remember key details.

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Scholastic Dishonesty: If you are caught in some form of scholastic dishonesty you will receive an F in the course, and you will be reported to Student Judicial Services (Office of the Dean of Students). You will receive no warning before these actions are taken. Be particularly careful when editing OWW Wiki pages— include references to all copyrighted material (such as figures from papers) that are not in the public domain.

Special Accommodations: The University of Austin provides appropriate academic accommodations for qualified students with disabilities upon request. For more information, contact the Office of the Dean of Students at 471-6259, 471-6441 TTY.

It is the policy of The University of Texas at Austin that the student must notify each instructor at least fourteen days prior to the classes scheduled on dates he or she will be absent to observe a religious holy day. For religious holidays that fall within the first two weeks of the semester, the notice should be given on the first day of the semester. The student may not be penalized for these excused absences but the instructor may appropriately respond if the student fails to complete satisfactorily the missed assignment or examination within a reasonable time after the excused absence.

Topics:

#	Date	Topic
1	Jan 16	Introduction: Class structure. What is Cancer? Creating a wiki page
2	Jan 23	Double Strand Break (DSB) Repair: How frequent are double strand breaks in cells? DSB repair in prokaryotes; SOS-response; DSB-repair in eukaryotes: Homologous Recombination
3	Jan 30	DSB Repair & Associated Diseases: Topics from week 2; DSB repair pathway choice; DSB repair-associated diseases
4	Feb 6	DNA Replication as a Source of Genomic Instability: Replicating aberrant structures; Replication-transcription Conflicts; Replication collapse at inter-strand cross links
5	Feb 13	Mechanisms of Mismatch Repair (MMR): MMR in prokaryotes; Very short patch repair; MMR in eukaryotes
6	Feb 20	Mismatch Repair, Evolution and Disease: Mismatch repair and adaptation; mutagenesis in prokaryotes; mutagenesis in eukaryotes; Lynch syndrome; MMR proteins in meiosis
7	Feb 27	Mitochondrial DNA Damage: Structure of mitochondrial DNA; Mechanisms of Mitochondrial DNA repair; Mitochondrial DNA damage and aging; Diseases associated with mitochondrial DNA damage
8	Mar 6	Guest Lecture
	Mar 13	No class: Spring Break
9	Mar 20	Nucleotide Excision Repair
10	Mar 27	Base Excision Repair
11	Apr 3	Damage Tolerance & Mutagenesis - Prokaryotes
12	Apr 10	Damage Tolerance & Mutagenesis - Eukaryotes
13	Apr 17	DNA damage and the cell-cycle response
14	Apr 24	p53 - The guardian of the genome
15	May 1	Student-selected topics

* At the instructor's discretion, the above schedule and topics may be modified. The class will be notified of any changes in class and on the OpenWetWare class web site.