

**INTD 6009 (Module 1 of INTD 5007)
Advanced Molecular Biology**

Spring 2021

CLASS DAYS and TIME: Tuesdays and Thursdays from 8:45 am to 10:40 am. Please note the modified start time (this is to allow students to attend the 11 am CSA seminars on Tuesdays and Thursdays at the main campus). The first day of class is Tuesday 1/12/2021.

CLASSROOM: TBD

COURSE FACULTY: P. Renee Yew, Ph.D., Course Director

TEACHING ASSISTANT: Jessica Scheirer, scheirer@livemail.uthscsa.edu

OFFICE LOCATION and HOURS: STRF 261.2, by appointment

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READ THIS DOCUMENT CAREFULLY - YOU ARE RESPONSIBLE FOR ITS CONTENTS.

COURSE DESCRIPTION AND OBJECTIVES

This is an 8-week course that represents one-half of the current course of INTD 5007, Advanced Cell and Molecular Biology. This module is focused on Advanced Molecular Biology and may be taken separately as an individual module. Topics will include: The nucleus; DNA structure, replication, damage, repair, recombination, and rearrangements; the nucleolus and RNA processing; microRNAs; transcription, chromatin and epigenetics; protein synthesis and modifications; and proteolysis. This advanced course provides a unique learning experience that prepares the student to evaluate and design new research in the cutting-edge areas of modern cell and molecular biology. The entire course comprises a small-group format in which students interact closely with a group of faculty members who have active research programs. For each topic, faculty will provide students with an overview of the research area. Students and faculty will then jointly discuss key publications that serve to bridge the gap between the student's prior understanding of the field and the state of the art in that research area.

Pre-requisites – None

Semester credit hours – 2 SCH

By the end of this course, each student should be able to:

- Explain the fundamental principles and regulation of molecular biological processes including nuclear organization, chromatin remodeling, DNA replication, DNA damage, DNA repair, DNA recombination, DNA rearrangement, transcription, RNA processing, RNA splicing, mRNA decay, RBP function, translation, microRNAs, protein folding and structure, post-translational modifications, and proteolytic pathways.
- Read an assigned scientific paper on one of the topics listed above and come up with a hypothesis and specific aims on the “next step” based on the topic of the assigned paper.
- Present the hypothesis, specific aims, rationale, and approach of the “next step” based on the topic of the assigned paper.

COURSE ORGANIZATION

The main teaching modalities used in this course include:

- 1) Didactic lectures on specific molecular biology topics with the purpose of conveying important concepts.
- 2) Group discussions of assigned papers with the purpose of discussing the paper results, strengths, and weaknesses with the goal of achieving the ability to critically read the scientific literature.
- 3) Generation of Powerpoint presentations and one-page summaries of the student's "next steps" with the purpose of learning to think about a topic and designing experiments to test a novel hypothesis.
- 4) Individual presentations of the student's "next step" with the purpose of honing presentations skills and learning to provide constructive criticism to colleagues.

General class format: In general, the classes will be divided roughly as 50% didactic lectures and 50% group learning/discussions. For each topic, instructors will provide a lecture with information that will help you to understand the given advanced topic and to help you to understand the assigned paper(s). All topics will include a paper assignment and an expected presentation or one-page summary by students.

1. Students are expected to read all the assigned papers independently and potentially be prepared to discuss the papers at the first class for each instructor. Some instructors may choose to spend some time reviewing the assigned paper as a group prior to the presentations so students will need to be prepared to discuss the assigned paper(s) during the first or second class period as indicated by the instructor. This paper review may involve the students taking turns to explain the figures of the paper as well as potentially explaining the background or conclusions of the paper. Not all instructors will go over the paper in detail during class.
2. Students are expected to come to the second class prepared to submit a written one-page summary or to present a short powerpoint (10 min presentation with 5 min for questions) describing a potential "next step" which will include a novel hypothesis, specific aims (usually 2 aims), and experimental procedures for addressing a question related to the topic. The one -page summary or powerpoint presentation should include all of the following in sufficient detail to fully understand your idea, but succinct enough to be presented in 10 min (for presentations) or to fit in one page (for written summaries): background, hypothesis, a clear rationale for your hypothesis, specific aims, experimental procedures, expected results, and caveats/alternative approaches.
3. All students need to submit their written one-page summaries or powerpoint presentation files via e-mail to the instructor by 8:45 am on the day of presentations.
4. Each instructor will inform the students ahead of time of any special instructions and deadlines for specific assignments. Instructors should not to deviate significantly from the format unless they discuss the changes with the course director first so we can inform all students ahead of time. If there is any confusion about the format, an instructor's expectations, or any other potential problems (you have not received the papers or lecture notes), please inform the course director immediately so problems can be addressed.

Materials – Laptop for presentations and viewing the lecture notes.

Access to Course Materials – General class information, messages from instructors, lecture notes and PDF files of papers will be posted to Canvas. You can access all up-to-date information about the class in Canvas. In general, the assigned paper(s) for each class will be available approximately one week preceding the scheduled class presentation date. The lecture notes will be available at least one day prior to the first class for each instructor.

Reading Assignments – Original papers will be assigned by each instructor at least 1 week in advance of the student presentations.

ATTENDANCE

Attendance and participation are mandatory and students should make sure they are in class on time. One large component of the grading is class participation so if a student misses a class due to sickness, the student needs to inform the instructors and course directors as soon as possible since this may result in an incomplete for the student. Any

scheduled absences must be approved by the course director prior to the absence and all absences need to be made up to prevent a reduced grade or incomplete.

TEXTBOOKS

No required textbooks.

GRADING POLICIES AND EXAMINATION PROCEDURES

Students will be graded on their participation, their presentations, and their powerpoint presentations or one-page summaries. There are no exams in this course. Instructors will provide their grades for each student along with any comments for improvement and these grades and comments will be e-mailed to each student following their classes. A final grade will be assigned by the course director based on the grades given to the students by each instructor.

Grading System

General grading criteria:

General participation in discussions (40%)	Clear presentation of hypothesis and aims in the Powerpoint and ability to address questions (60%)
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Approximate Grading Scale:

A = 90-100% B = 80-89% C = 70-79% F = < 69%

REQUESTS FOR ACCOMODATIONS FOR DISABILITIES

In accordance with policy 4.2.3, **Request for Accommodation Under the ADA and the ADA Amendments Act of 2008 (ADAAA)**, any student requesting accommodation must submit the appropriate request for accommodation under the American with Disabilities Act (ADA, form 100). to his/her appropriate Associate Dean of their School and a copy to the ADA Coordinator. Additional information may be obtained at <http://uthscsa.edu/eo/request.asp>.

ACADEMIC INTEGRITY AND PROFESSIONALISM

Any student who commits an act of academic dishonesty is subject to discipline as prescribed by the UT System Rules and Regulations of the Board of Regents. Academic dishonesty includes, but is not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an exam for another person, signing attendance sheets for another student, and any act designed to give unfair advantage to a student or the attempt to commit such an act. Additional information may be obtained at <http://catalog.uthscsa.edu/generalinformation/generalacademicpolicies/academicdishonestypolicy/>

TITLE IX AT UTHSCSA

Title IX Defined:

Title of the Education Amendments of 1972 is a federal law that prohibits sex discrimination in education. It reads "no person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance."

University of Texas Health Science Center San Antonio's Commitment:

University of Texas Health Science Center San Antonio (UTHSCSA) is committed to maintaining a learning environment that is free from discriminatory conduct based on gender. As required by Title IX, UTHSCSA does not discriminate on the basis of sex in its education programs and activities, and it encourages any student, faculty, or staff member who thinks that he or she has been subjected to sex discrimination, sexual harassment (including sexual violence) or sexual misconduct to immediately report the incident to the Title IX Director.

In an emergency, victims of sexual abuse should call 911. For non-emergencies, they may contact UPD at 210-567-2800. Additional information may be obtained at <http://students.uthscsa.edu/titleix/>

EMAIL POLICY

Course information and instructions will be e-mailed to students. Additionally, students should communicate with the course director via e-mail.

USE OF RECORDING DEVICES

Recording devices during the lectures are allowed with the permission of each instructor.

ELECTRONIC DEVICES

Electronic devices such as cell phones, computers, tablets, etc. are permitted in class, but we ask that you silence your cell phones during class.

Class Schedule

Advanced Molecular Biology, INTD 6009 (2 SCH); Module 1 of INTD 5007, Spring 2021

Course Director: P. Renee Yew

Teaching Assistant: Jessica Scheirer

Group 1: Group 2:					
Week	Day	Date	Lecture Topic	Instructor	Location
Advanced Molecular Biology INTD 6009 (2 SCH) Day and Time: Tuesdays and Thursdays 8:45-10:40 am Place: TBD					
1	Tues	01/12/21	The nucleus, DNA organization, and the nucleolus	TBD	TBD
	Thur	01/14/21	Chromatin and epigenetics	Kexin Xu	TBD
2	Tues	01/19/21	DNA replication, DNA damage, and DNA repair	Alex Bishop	TBD
	Thur	01/21/21			
3	Tues	01/26/21	DNA replication, DNA damage, and DNA repair (presentations due) One-page summary: Group 1 Powerpoint presentation: Group 2	Alex Bishop	TBD
	Thur	01/28/21	DNA recombination and DNA rearrangements One-page summary: Group 2 Powerpoint presentation: Group 1	Sang Eun Lee	TBD
4	Tues	02/02/21			
	Thur	02/04/21	Transcription and transcriptional regulation One-page summary: Group 1 Powerpoint presentation: Group 2	David Kadosh	TBD
5	Tues	02/09/21			
	Thur	02/11/21	RNA processing One-page summary: Group 2 Powerpoint presentation: Group 1	Masahiro Morita	TBD
6	Tues	02/16/21			
	Thur	02/18/21	microRNAs One-page summary: Group 1 Powerpoint presentation: Group 2	Manjeet Rao	TBD
7	Tues	02/23/21			
	Thur	02/25/21	Protein synthesis, folding, and structure; post-translational modifications One-page summary: Group 2 Powerpoint presentation: Group 1	Maria Gaczynska	TBD
8	Tues	03/02/21			
	Thur	03/04/21	Proteolysis: Ubiquitin-dependent proteolysis, the proteasome and other proteolytic pathways One-page summary: Groups 1 and 2 due by e-mail on 03/07/21	Maria Gaczynska	TBD