

CSAT 6077
Eucaryotic Cell Biology
Fall 2020

CLASS DAYS: Wednesdays and Fridays (August 26 – October 14, 2020)

CLASSROOM: Online

COURSE DIRECTOR: Dr. Ramaswamy Sharma

OFFICE LOCATION and HOURS: MED 2.024V1; by appointment only

EMAIL: sharmar3@uthscsa.edu

TELEPHONE: (210) 567 3845

READ THIS DOCUMENT CAREFULLY – YOU ARE RESPONSIBLE FOR ITS CONTENTS

COURSE DESCRIPTION AND OBJECTIVES

This 8-week didactic course will introduce the student to the fundamentals of cell biology, familiarize the student with current techniques used to manipulate cells, describe the higher order integration of cells to tissues and thereby the development of multicellular organisms.

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

1. Describe the structure and function of the various organelles of eukaryotic cells, including the cytoskeleton and the cell membrane, describe light and electron microscopy and the methods to purify and validate purity of organelles.
2. Describe the cellular machinery involved in membrane transport of small molecules including ATP pumps and ion channels, define resting membrane potential and how opening and closing of ion channels affect the membrane potential.
3. Describe how protein is sorted to reach its specific destination within the cell including signal sequences, N-glycosylation and the unfolded protein response.
4. Describe cell bioenergetics, including the chemiosmotic coupling hypothesis, mitochondrial genetics, function & dysfunction.
5. Describe the cell cycle, including mitosis, meiosis and the checkpoints.
6. Describe the general principles of intracellular and extracellular signaling, key signaling pathways and their dysregulation in cancer.
7. Describe and identify cell death mechanisms such as apoptosis, autophagy and necrosis.
8. Describe cell polarity, cell-cell junctions and cell-extracellular matrix interactions.
9. Describe the morphogenesis and growth of multicellular organisms and neurogenesis and associated disorders.
10. Describe tissue and cell renewal mechanisms including stem cells.
11. Describe and evaluate the various techniques used to grow and analyze cells.
12. Learn how to find, evaluate and use resources to explore a topic in depth (eg. PubMed).
13. Learn to analyze and critically evaluate ideas, arguments and points of view.

PRE-REQUISITES – None.

SEMESTER CREDIT HOURS – 2.0

COURSE ORGANIZATION

Major teaching modalities used in this course include:

- Lectures
- Class discussions requiring active student participation.
- Independent Learning
- Class Presentations

Materials:

- Slides for each lecture will be made available in CANVAS as .pdf. Print copies will not be provided.

Computer Requirements:

- Students are required to have a laptop computer (Macintosh or PC) for class presentations, CANVAS access for course materials, and for exams.
- Software required: Microsoft Office, Adobe Acrobat Reader
- All laptops will connect to The UTHSCSA network via the HSCwave broadcast wireless connection.
- Authentication for wireless use is based on The UTHSCSA domain username and password.
- Verification of proper operation **prior** to the start of class is highly recommended.
- Assistance is available thru the IMS Service Desk
 - Telephone: 567-7777
 - E-mail: ims-servicedesk@uthscsa.edu

Assistance is also available at the IMS Student Support Center (4.421T, DTL).

Reading Assignments – Recommended reading will be listed in the Objectives section for each class.

ATTENDANCE

Attendance for every class session is mandatory. Excused absences may be granted at the discretion of the Course Director. For pre-scheduled events, students must provide advanced notice to the Course Director via e-mail to be excused. In case of illness, please notify the Course Director prior to the beginning of the class and provide a doctor's certificate at the next class. Other emergencies will be evaluated on a case-to-case basis. The e-mail request to the Course Director for consideration of an excused absence must provide details regarding the circumstances and specific dates.

If a student requests an absence for religious observances (which must meet the policy requirement of the University), he/she must notify the Course Director and file the appropriate form (Notification of Planned Absence to Observe a Religious Holiday) within the first 15 days of the term. The student is responsible for obtaining the form from the Registrar's Office, completing it and organizing to meet with the Course Director to have it signed and dated. Per University policy, the Course Director will stipulate a reasonable time within which the student must complete the missed course activities for that day.

More than 1 unexcused absence will result in a 5% penalty on the final grade for each missed class. Makeup of excused absences is at the discretion of the Course Director.

TEXTBOOKSRequired:

Molecular Biology of the Cell, Alberts et al., Sixth edition, Published by Garland Science.

Recommended:

Molecular Cell Biology, Lodish et al., Eighth edition, Published by W.H.Freeman and Company.

GRADING POLICIES AND EXAMINATION PROCEDURES

1. Students are required to present an article (100 points). Points will be assigned for background and presentation

- of data, answering questions related to the article, critical analysis of paper, prediction of future experiments and description of significance of the article.
2. Students will take exams on their computers at the assigned time. It is the student's responsibility to familiarize themselves with their equipment and/or the examination software. Remember to charge the laptop battery and if necessary, keep your power cord attached to the computer. Please note that the commencement of the exam will not be delayed due to a hardware or software problem with any student's computer nor will they be provided additional time to take their exam. Students having computer difficulty during the exam must notify the proctor immediately for instructions. Students will be using the Lockdown Browser and their webcam for taking the examination.

EXAMS USING LOCKDOWN BROWSER & WEBCAM

This course requires the use of LockDown Browser and a webcam for online exams. The webcam can be the type that's built into your computer or one that plugs in with a USB cable.

BEFORE CLASS ON DAY 1:

1. Watch this brief video before class to get a basic understanding of LockDown Browser and the webcam feature.

<https://www.respondus.com/products/lockdown-browser/student-movie.shtml> (Links to an external site.)

2. Download and install LockDown Browser from this link:

<https://download.respondus.com/lockdown/download.php?id=989116329> (Links to an external site.)

FOR EVERY EXAM:

- Start LockDown Browser. You will have to quit all other applications.
- Log into to Canvas and select UT-Health (not test!)
- Navigate to the exam

Note: You won't be able to access an exam that requires LockDown Browser with a standard web browser. If this is tried, an error message will indicate that the test requires the use of LockDown Browser. Simply start LockDown Browser and navigate to the exam to continue.

IMPORTANT: If you are stuck and have questions, call me at (210) 567 3845.

Guidelines

When taking an online quiz/exam, follow these guidelines:

- Ensure you're in a location where you won't be interrupted
- Turn off all other devices (e.g. tablets, phones, second computers) and place them outside of your reach
- Before starting the test, know how much time is available for it, and also that you've allotted sufficient time to complete it
- Clear your desk or workspace of all external materials not permitted - books, papers, other devices
- Remain at your computer for the duration of the test
- If the computer, Wi-Fi, or location is different than what was used previously with the "Webcam Check" and "System & Network Check" in LockDown Browser, run the checks again prior to the exam
- To produce a good webcam video, do the following:
 - Avoid wearing baseball caps or hats with brims
 - Ensure your computer or device is on a firm surface (a desk or table). Do NOT have the computer on your lap, a bed, or other surface where the device (or you) are likely to move
 - If using a built-in webcam, avoid readjusting the tilt of the screen after the webcam setup is complete
 - Take the exam in a well-lit room, but avoid backlighting (such as sitting with your back to a window)
- Remember that LockDown Browser will prevent you from accessing other websites or applications; you will be unable to exit the test until all questions are completed and submitted

3. If a student feels that an examination question could have been answered in more than one way, then it is the student's responsibility to present the rationale for the correctness of alternate answers to the specified question to the Course Director within 3 days after the exam.
4. There will be a mid-term exam and a final exam, each worth 100 points. Final grades will be based on scores received in the mid-term exam (20%), presentation (40%) and final exam (40%). A = >89.5-100% B = >79.5-89.4% C = >69.5-79.4% D = > 59.5% -69.4% F= <59.4%
5. The grade, "F", will be reported to the Registrar when a student is absent from a scheduled examination without permission from the Course Director and/or does not complete all course requirements.
6. A student who receives an F grade must retake the course in order obtain a change of grade.
7. Final grades will be reported to and recorded by the Registrar. Final grades may be obtained only from the Registrar. Under no circumstances will these grades be given to students by the teaching faculty.

E-MAIL POLICY

All correspondence will be sent to the student using the student's LiveMail address and via CANVAS. It is the responsibility of the student to make sure that there is sufficient space in their mailbox to receive any such notices. Course Directors will not attempt other means to provide you with a notice if they receive a course notice because of "an exceeded email limit". All correspondence from the student to the Course Director should be sent to the course director's e-mail as listed on the first page of this syllabus.

USE OF RECORDING DEVICES

Lectures may only be recorded with the permission of the Course Director, **obtained in advance**. Please do not show up to class and ask if that day's lecture may be recorded.

ELECTRONIC DEVICES

Cell phones should be turned off or put away during class. Computers and tablets may be used to follow along with slides, take notes, look up the occasional unfamiliar term, and perform other activities directly related to the course material. Texting, tweeting, e-mailing, web-surfing, gaming, or any use of electronic devices that is not directly connected with classroom activities is not permitted. Any student in violation of this policy will be excused from the learning environment and marked absent for the day. An e-mail will then be sent to the Associate Deans of Student Affairs apprising them of the incidence.

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/>

CLASS SCHEDULE
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WEEK (N)	DATE (M/D)	TIME/FACULTY	ROOMS	SUBJECT
WEEK 1	08/26 Wed	1:15 – 3:30 pm Dr. Sharma	2.023V	ORGANELLES
	08/28 Fri	1:15 – 3:30 pm Dr. Lechleiter	2.023V	MEMBRANE TRANSPORT OF SMALL MOLECULES
WEEK 2	09/02 Wed	1:15– 3:30 pm Dr. Dong	2.023V	CYTOSKELETON & CELL MOVEMENT
	09/04 Fri	1:15 – 3:30 pm Dr. Lechleiter	2.023V	MEMBRANE POTENTIAL & ION MOVEMENT
WEEK 3	09/09 Wed	1:15 – 3:30 pm Dr. Sharma	2.023V	PROTEIN SORTING AND INTRACELLULAR MEMBRANE TRAFFIC
	09/11 Fri	1:15 – 3:30 pm Dr. Bai	2.023V	CELL METABOLISM
WEEK 4	09/16 Wed	1:15 – 3:30 pm Dr. Dong	2.023V	CELL CYCLE
	09/18 Fri	1:15 – 3:15 pm Dr. Sharma	2.023V	MID-TERM EXAM
WEEK 5	09/23 Wed	1:00 – 3:30 pm Dr. Bouamar	2.023V	CELL SIGNALING
	09/25 Fri	1:00 – 3:30 pm Dr. Sharma	2.023V	CELL ADAPTATION & DEATH
WEEK 6	09/30 Wed	1:00 – 3:30 pm Dr. Sharma	2.023V	CELL JUNCTIONS & EXTRACELLULAR MATRIX
	10/02 Fri	1:00 – 3:30 pm Drs. Wang & Chen	2.023V	DEVELOPMENT OF MULTICELLULAR ORGANISMS
WEEK 7	10/07 Wed	1:30 – 3:30 pm Dr. Kokovay	2.023V	STEM CELLS AND TISSUE RENEWAL
	10/09 Fri	1:15 – 3:15 pm Dr. Sharma	2.023V	CRITICAL ANALYSIS OF PAPERS IN CELL BIOLOGY (Student Presentations)
WEEK 8	10/14 Wed	1:15 – 3:15 pm Dr. Sharma	2.023V	FINAL EXAM