



SAINT LOUIS UNIVERSITY
MADRID

BIOL-3040-M01 CELL STRUCTURE AND FUNCTION
Spring 2018

Class Days and Time: TR 4:00-5:15 pm
Classroom: PAH 24
Prerequisite(s): BIOL-1240
Credit(s): 3
Instructor: Marina Rodriguez del Valle, PhD
Instructor's Email: marina.rodriguez@slu.edu
Instructor's Campus Phone: 91 554 58 58, ext. 232
Office: PAH 206
Office Hours: MWF, 11:00-13:00 TR, 3:00-4:00

I. COURSE DESCRIPTION:

In this course we will explore the exquisite organization of eukaryotic cells, and how their components work together to direct cell movement, cell division and interactions of the cell with the environment.

Topics for lectures include: membrane dynamics, cellular trafficking, cytoskeleton dynamics, cell cycle, cell communication and signaling.

We will discuss different diseases, including cancer and drug therapies to gain a better understanding of important cellular processes and how alterations on those can lead to disease.

II. COURSE GOALS:

- To learn the components of cellular structures and organelles and their functions within a cell
- To understand the roles of specific macromolecules as they relate to organelle and cell function
- To appreciate the dynamic nature of the cell, including how it receives and responds to stimuli from its environment
- To gain a better understanding of experimental approaches used to answer question in Cell Biology
- Development of critical thinking as reading, summarizing and analyzing scientific articles in the Cell Biology field.

III. STUDENT'S LEARNING OUTCOMES:

1. Students will be able to discuss the organizational hierarchy of cells, their constituent molecules, the structure and function of cellular organelles, and the roles of specific cell types in multicellular organisms
2. Students will be able to understand the relationships between the environment, extracellular signaling and cellular behavior.
3. Students will develop extensive knowledge in the structure and function of the components of cells and their relationships with cellular processes.
4. Students will be able to describe the molecular processes that occur within cells and their impact on body function, aging and cancer.
5. Students will be able to apply reasoning and critical thinking skills to problems in cellular and molecular biology.
6. Gain an understanding of the basic techniques applied in the field of Cell Biology.
7. Students will be able to search, interpret and present information related to cell biology.
8. Students will be able to effectively communicate their understanding of Biology and their findings.

Saint Louis University - Madrid Campus is committed to excellent and innovative educational practices. In order to maintain quality academic offerings and to conform to relevant accreditation requirements, the Campus regularly assesses its teaching, services, and programs for evidence of student learning outcomes achievement. For this purpose anonymized representative examples of student work from all courses and programs is kept on file, such as assignments, papers, exams, portfolios, and results from student surveys, focus groups, and reflective exercises. *Thus, copies of student work for this course, including written assignments, in-class exercises, and exams may be kept on file for institutional research, assessment and accreditation purposes.* If students prefer that Saint Louis University - Madrid Campus does not keep their work on file, they need to communicate their decision in writing to the professor.

CLASS OVERVIEW:

UNIT 1. Introduction to the Cell and Microscopy

UNIT 2. Membrane Structure and function

Chemical components of membranes.

Fluidity, asymmetry and dynamic structure of membranes

Unit 3. Transport across cell membranes

Diffusion. Transport mediated by proteins. Membrane potential. Signaling in nerve cells.

Unit 4. Intracellular compartments and transport. Vesicular Traffic

Protein processing and folding in the ER. Protein sorting. ER stress.

Vesicular traffic. Secretory pathways. Lysosomes

Endocytic pathways. Autophagy.

Unit 5. Cellular Communication

Intracellular receptors. G-protein coupled and enzyme coupled receptors.

RTKs, MAP kinases

Cell signaling and proteolytic cleavage. Cell signaling in plants.

Unit 6. The Cytoskeleton

Functions. Microtubules. Filaments.

Actin-binding proteins. Motor proteins. Motility and changes in cell shape.

Unit 7. Cell Cycle

Overviews. Cyclin and Cdks. Checkpoints.

Cell cycle control system: molecular mechanisms.

Control of cell numbers and size.

Unit 8. Cellular Communities

Extracellular matrix. Interactions cell-extracellular matrix. Integrins. Cell adhesion

Unit 9. Cell Aging and Cancer

Apoptosis. Capsases. Regulation of cell death.

Causes of cancer. Types of cells involved. Genes implicated. Combating cancer.

REQUIRED TEXTS AND MATERIALS:

- Essential Cell Biology. Alberts et al (4th edition). Garland Science
- Molecular Cell Biology. Lodish et al (7th edition). Mc Millan

*These books are on reserve in the SLU Library.

Older editions of some textbooks are available FREE online from NCBI website:

<http://www.ncbi.nlm.nih.gov/books>

For example, Lodish et al (2000) Molecular Cell Biology 4th Edition can be accessed via:

<http://www.ncbi.nlm.nih.gov/books/NBK21475/?term=LODISH%20CELL%20BIOLOGY>

ONLINE RESOURCES

Extensive use of SLU Blackboard learning System will be employed. All lectures will be posted there and it should be checked daily for announcements. Other supporting material, including course syllabus, lecture schedule, handouts, announcements, homeworks, links to tutorials and other materials, will also be available on the SLU Backboard site.

EXAMS

There are three exams for this course: two mid-terms and a final. The exams are not cumulative, thus the first mid-term will examine the material covered up to this exam. The second mid-term will examine the material covered after the first mid-term, and the final exam will examine the material covered after the second mid-term.

However, there is also a comprehensive final exam that examines all of the course material. This exam is obligatory for students who fail or miss either mid-term exam. It is voluntary for any students who, having done their mid-terms, would like to try and improve their grade (but a poor result may obviously reduce the grade).

Students who miss an exam are required to provide written documentation of the circumstances (doctor's medical certificate, letter from university counselor, etc.)

Important Dates:

First Mid-Term: TUESDAY FEB 13
Second Mid-Term: TUESDAY MAR 20
Final Exam: WEDNESDAY MAY 9 (3:30-6:30 PM)

GRADES:

Your grade for the course will be based on the following:

Midterm exam 1	24%
Midterm exam 2	24%
Final exam	24%
Homeworks, assignments	18%
Final project	10%

The grade you earn will be based on your performance on the lecture exams, the final exam, assignments and the laboratory. Your final grade will be calculated based on the total percentage you earn in the course. You must earn the minimum score without any rounding up in order to receive that grade (e.g. you must have 90% in order to receive an A-, not 89.95%).

There will be no opportunity for "extra credit" to improve grades that have already been earned. Bargaining for grades (e.g., "I need a B because...") will not be tolerated. The only way to achieve the minimum grade that you require is to attend class every day, study suitably for exams, and successfully complete all assignments.

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Percentages for Grade Calculation:

A	93-100%
A-	90-92.99%
B+	87-89.99%
B	83-86.99%
B-	80-82.99%
C+	77-79.99%
C	73-76.99%
C-	70-72.99%
D	60-69.99%
F	0-59.99%

CLASS POLICIES:

(1) Contacting Faculty Instructor: Email is the preferred method of communication for contacting faculty. Because the relationship between faculty and students is a professional one, not a personal one, please use your SLU email address rather than a personal email account. We make every effort to respond to emails promptly; typically, you can expect a response within 24 hours, excluding evenings and weekends. If we don't respond within 24 hours, please feel free to re-send the email.

(2) Class attendance: Attendance at all class meetings is expected. Data from previous classes show that students who miss one or more classes earn at least one letter grade lower than those students who do not miss classes. If you do miss a class, it is your responsibility to obtain the notes from SLU Global and/or another student. We recommend that you exchange names and phone numbers with at least two other students in the class for this purpose; however, no student is obligated to share notes or other information with any other student. If you miss an assignment, quiz, graded in-class activity, etc., remember that you will not be allowed to make it up; do NOT contact the instructors to ask us to make an exception for you.

(3) Students are encouraged to participate in class discussions and to ask questions

(4) All Power Point presentations will be placed on Blackboard, as well as Announcements, Homework Assignments and Readings. Blackboard should be checked at a regular basis.

(5) Exam questions may come from material covered in lecture, class discussions, from the assigned reading and from any supplementary reading material provided.

(6) Make up exams are not given. Students who legitimately miss an exam, due to a doctor or family emergency must provide written documentation of the circumstances. A letter from the university counselor is accepted. Exams that are missed illegitimately result in a score of F. Grades for these students will be based on the remaining exams. Missing more than one exam results in an F.

(7) Policy on Technology in the Classroom:

a. Cell phones or other electronic devices (e.g. iPods, iPads, Blackberrys, etc.) are NOT permitted during lecture. Please be sure that you have your device turned off or set to vibrate and stored out of sight before the start of class. If you are expecting an urgent or emergency phone call, please let your instructor know before the beginning of class.

b. Laptop computers are NOT permitted in this class. If you need to use your laptop due to an appropriate accommodation (see Disabilities Services and Accommodations information below) please discuss this with your instructor.

E-mail: Campus and course announcements will often be handled by e-mail. Students should check their "@slu.edu" e-mail regularly.

University Statement on Academic Integrity: Academic integrity is honest, truthful and responsible conduct in all academic endeavors. The mission of Saint Louis University is "the pursuit of truth for the greater glory of God and for the service of humanity." Accordingly, all acts of falsehood demean and compromise the corporate endeavors of teaching, research, health care and community service via which SLU embodies its mission. The University strives to prepare students for lives of personal and professional integrity, and therefore regards all breaches of academic integrity as matters of serious concern.

The governing University-level Academic Integrity Policy can be accessed on the Provost's Office [website](#). Additionally, SLU-Madrid has posted its academic integrity policy online: <http://www.slu.edu/madrid/academics>. As a member of the University community, you are expected to know and abide by these policies, which detail definitions of violations, processes

for reporting violations, sanctions and appeals.

The professor will review these matters during the first weeks of the term. Please direct questions about any facet of academic integrity to your faculty, the chair of the department of your academic program, or the Academic Dean of the Madrid Campus.

University Title IX Statement: Saint Louis University and its faculty are committed to supporting our students and seeking an environment that is free of bias, discrimination, and harassment. If you have encountered any form of sexual misconduct (e.g. sexual assault, sexual harassment, stalking, domestic or dating violence), we encourage you to report this to the University. If you speak with a faculty member about an incident of misconduct, that faculty member must notify SLU's Title IX deputy coordinator, Marta Maruri, whose office is located on the ground floor of Padre Rubio Hall, Avenida del Valle, 28 (mmaruri@slu.edu; 915-54-5858, ext. 213) and share the basic fact of your experience with her. The Title IX deputy coordinator will then be available to assist you in understanding all of your options and in connecting you with all possible resources on and off campus.

If you wish to speak with a confidential source, you may contact the counselors at the SLU-Madrid's Counseling Services on the third floor of San Ignacio Hall (counselingcenter-madrid@slu.edu; 915-54-5858, ext. 230) or Sinews Multipletherapy Institute, the off-campus provider of counseling services for SLU-Madrid (www.sinews.es; 917-00-1979). To view SLU-Madrid's sexual misconduct policy and for resources, please visit the following web address: <http://www.slu.edu/Documents/Madrid/campus-life/SLUMadridSexualMisconductPolicy.pdf>.

Students with Special Needs: In recognition that people learn in a variety of ways and that learning is influenced by multiple factors (e.g., prior experience, study skills, learning disability), resources to support student success are available on campus. Students who think they might benefit from these resources can find out more about:

- Course-level support (e.g., faculty member, departmental resources, etc.) by asking your course instructor.
- University-level support (e.g., tutoring/writing services, Disability Services) by visiting the Academic Dean's Office (San Ignacio Hall) or by going to <https://www.slu.edu/madrid/academics/student-resources>.

Students with a documented disability who wish to request academic accommodations must contact Disability Services to discuss accommodation requests and eligibility requirements. Once successfully registered, the student also must notify the course instructor that they wish to access accommodations in the course. Please contact Disability Services at disabilityservices-madrid@slu.edu or +915 54 58 58, ext. 230 for an appointment. Confidentiality will be observed in all inquiries. Once approved, information about the student's eligibility for academic accommodations will be shared with course instructors via email from Disability Services. For more information about academic accommodations, see "Student Resources" on the SLU-Madrid webpage.

Note: Students who do not have a documented disability but who think they may have one are encouraged to contact Disability Services.