

PBIO 431/531: Plant Cell Biology - Fall 2005
Call #s 07295 and 07296; 5 credit hours

Contact information:

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Course objectives:

Cell biology is a growing field. Currently, most published studies from cell biology are the convergence of three scientifically distinct fields: Biochemistry, Genetics/Molecular biology, and cytology. Cell biology today is the study of what components make up the cell, how they got there, and what they do, which includes the study of how cells interact with each other.

This course satisfies the 500/400-levels course requirements. It is designed to provide you with comprehensive exposure to the subject of cell and molecular biology. You will learn the basics of cell structure and function, and you will learn few investigative and learning tools with which you can continue to explore cell biology. In order to get as much as you can out of this course, you must have the necessary basic knowledge in biochemistry and plant physiology. The laboratory exercises will be investigative and literature-based since you will be required to write 6 lab reports and present a summary of a methodology that you will choose among the proposed topics.

It is my responsibility to help you learn, however what you learn will depend on your efforts. I expect you to make clear to me when you don't understand something, preferably by asking questions in class, where other students will also benefit from clarification. Alternatively, come see me during my office hours or send me a note via e-mail. I can't know whether I have explained things clearly or not unless you give me feedback in the form of questions.

Suggested Text: Alberts, et al. (2002) Molecular Biology of The Cell, 4th edition.

Lectures: 9:10 - 10:00am, MWF, room 417

Laboratories: 1:10 - 5:00pm Thu, room 304

Grading policy: Your final grade will be based on **1000** points:

Lecture Component (45%)		Laboratory Component (42%)		Discussion Component (13%)	
Exam I	150	6 Lab Reports	420	Presentation	130
Exam II	150				
Final exam	150				
Total	450	Total	420	Total	130

Each exam is composed of short answer questions and essays. Topics to be covered on a given examination will be announced when the date of the exam is confirmed. The point from each component will be added and a letter grade will be assigned, using the following scale:

	431 level student	524 level students
A+, A, A-	100- 85%	100- 90%
B+, B, B-	84-75%	89-80%
C+, C, C-	74-60%	79-70%
D+, D, D-	59-50%	69-60%

Late lab reports and presentations will be penalized 5% of their maximum original value per day (i.e., a 70 pt report will be penalized 3.5 pt per day; a 130 pt presentation will be penalized 6.5 pt per day). If you miss an exam, I will give you a zero for the test, unless you contact me in advance and provide sufficient reason why you will miss the exam.

Attendance policy: Lecture attendance is strongly encouraged, but discussion/presentation and lab attendance are mandatory. Few or no absences will be considered during the grading process when a student is close to receiving the next higher letter grade.

Academic dishonesty: The penalty of cheating on an examination or plagiarizing will be failure of the course.

Course organization: The course has three components:

I-Lecture component (2 x 1h) Monday and Friday: The lectures will attempt to cover all the following topics:

A-Internal organization of the cell:

1-Organelles common to cells:

- The endoplasmic reticulum (ER)
- Protein sorting and vesicular traffic.
- Mitochondria
- Cytoskeleton
- Nucleus: (chromatin, cell division, regulation of gene expression)

2-Organelles unique to some species or tissues:

- Centriole: found only in animal cells and function in cell division.
- Vacuoles: found in plant
- Cell walls: rigid structure found surrounding plant cells.
- Plastids: found in plants and some protists but not in animals or fungi.
- Cilia and flagella: found in many different life forms.

B-Cells in their social context

- 1-Cell communication
- 2-Cell junction, adhesion
- 3-Cell replication and reproduction

C-Plasma membrane: structure and function

II-Discussion/presentation component (1x 1h) Thursday: Basic notions on other methodology that were not covered in labs. The goal of this exercise is 1) to attract student's attention on recent advances in cell biology tools, and 2) to develop the student's capacity to present and explain these scientific advances. Each student will make a presentation and lead a discussion on specific topics. Your participation and extensive contribution are critical for success of the class setting.

III-Laboratory component (1 x 4h) Thursday: It consists of one meeting per week (Thu, 1:10-5pm). The laboratory is designed to allow the student to get hands on techniques used in cell and molecular biology labs. It will also develop the student's ability to understand protocols and interpret their own data.

Tentative schedule for P BIO 431-531 class (Subject to change)

Date	Day	Lectures	Reading	Discussions
Sep. 7	W	Introduction to class regulations		
Sep. 9	F	Endoplasmic Reticulum-I	Ch.12	
Sept. 12	M	Endoplasmic Reticulum-II	Ch.12	Methodology topic assignment
Sep. 14	W		Ch. 8-9	
Sep. 16	F	Protein sorting & vesicular traffic-I	Ch.12-13	
Sep. 19	M	Protein sorting& vesicular traffic -II	Ch.12-13	Lab and methodology topic preparation
Sep. 21	W		Ch. 8-9	
Sep. 23	F	Protein sorting& vesicular traffic -III	Ch.12-13	
Sept. 26	M	Mitochondria	Ch.14	
Sep. 28	W	Exam 1		
Sep. 30	F	Cytoskeleton-I	Ch.16	
Oct. 3	M	Cytoskeleton-II	Ch.16	Lab and methodology topic preparation
Oct. 5	W		Ch. 8-9	
Oct. 7	F	Nucleus-I	Ch.17-18	
Oct. 10	M	Nucleus-II	Ch.17-18	Methodology presentation
Oct. 12	W		Ch. 8-9	
Oct. 14	F	Centriole,	Ch.16	
Oct. 17	M	Plastids	Ch.14	Methodology presentation
Oct. 19	W		Ch. 8-9	
Oct. 21	F	Cilia and flagella	Ch.16	
Oct. 24	M	Cell wall	Ch.?	
Oct. 26	W	Exam 2		
Oct. 28	F	Cell communication	Ch.15	
Oct. 31	M	Cell junction/adhesion	Ch.19	Methodology presentation
Nov. 2	W		Ch. 8-9	
Nov. 4	F	Cell replication/reproduction-I	Ch.20	
Nov. 7	M	Cell replication/reproduction-II	Ch.20	Methodology presentation
Nov. 9	W		Ch. 8-9	
Nov. 11	F	Plasma membrane structure	Ch.10	