

CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA

BIO 435: Cell Physiology

Spring Quarter, 2002

Course Information Sheet (Syllabus)

CRN#	Subj	Crse	Sect	Course title	Units	Days	Time	Bldg	Rm	Instructor
21046	BIO	435	01	Cellular Physiology	3	MWF	0900-0950	3	128	Dr. Glenn Kageyama
21047	BIO	435L	01	Cellular Physiology Lab	2	MW	1200-1450	8	138	Algie Au
21117	BIO	435L	02	Cellular Physiology Lab	2	MW	1500-1750	8	138	Deb Burbridge

Professor: Dr. Glenn H. Kageyama Office hours: MW 10:00-12 noon
8-129, (909) 869-5305 (leave voice mail message) F 10:00-1100
e-mail: ghkageyama@csupomona.edu and ghkageyama@excite.com

Prerequisites: a. Biology 115, and preferably Biology 310, or equivalent
b. Chemistry, through Organic Chemistry
c. A proficiency in basic Biology, Chemistry and Physics

Required texts: a. Becker, Kleinsmith, Hardin, The World of the Cell, 4th Ed., 2000
b. Cell Physiology Lecture Notes, by Dr. Kageyama (ASK Copy)
c. Cell Physiology Laboratory Manual, by Dr. Kageyama & Renata Pires (ASK Copy)

Laboratories: Lab coat; scientific or statistical calculator; graph paper.

Course Objectives: To give students an exposure to basic principles of cell physiology, accomplished via

classroom lecture-discussions, laboratory exercises and readings in the basic literature of the field.

Hopefully, students will develop an appreciation for a basic understanding of cellular physiology. Through a

review of the history of cell physiology, the student may learn the philosophy of science. Hopefully, the student will use the knowledge in a constructive way to advance humanity.

General Requirements and Policies: Read text assignments before lectures so that you may better understand

lectures and participate in class discussions. Questions and curiosity are important aspects of learning. Students are required to attend all laboratories (except for illness or other valid reason), do all the experiments assigned, and submit all laboratory reports at the beginning of the following Wednesday's laboratory.

Schedule of Exams: Three examinations: two midterms and one final. The general nature of the exams will

be announced. The exams missed due to unavoidable events such as accidents, illness, etc. can be made up later at the Learning Resource Center (15-4, bottom floor of library; talk to Laura at x3503).

Examination Method: Each exam will include fill-in, calculations, multiple choice, matching and/or short answer questions on lecture and lab. (Contact Dr. Kageyama prior to the scheduled exam time to schedule a make-up exam.) Six "pop" quizzes will be given at the beginning of certain laboratory sessions (one quiz with the lowest grade will be dropped).

Grading: An incomplete (I) or a lower grade will be assigned if these requirements are not met. Midterm I & II

will be worth 75 points each. The second midterm will include material covered labs and in the first exam. The final (150 points) will also be comprehensive. Five (out of six) quizzes each worth 10 points each (50 points total) will cover laboratory material of the previous or current laboratory sessions. Each laboratory write-up (10 points each) will be judged to be excellent (A: 9-10 points), very good (B: 7-8 points), good (C: 5-6 points) or marginal (D: 3-4 points). The effort in laboratory work (such as cleaning lab bench,

CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA

washing dirty glassware, taking care of instruments: minus 1-2 points/lab for infractions of good laboratory practice) will be integrated in the final grade for the lab. The maximum score for laboratory reports is 140 points + 20 points for attendance and laboratory performance, and 60 points for a laboratory group project.

Lecture units (3.0)			Laboratory units (2.0)		
Midterm I	60 points	20%	Lab Reports	140 points	53%
Midterm II	60 points	20%	Laboratory quizzes (5/6)	50 points	17%
Projects/Quizzes	60 points	20%	GLP (Performance)	20 points	7%
Final Examination	120 points	40%	Laboratory PPT project	60 points	23%
Total	300 points	100%	Total	300 points	100%

CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA

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Lecture/Lab Schedule

Dr. Glenn H. Kageyama
Office: 8-129; 869-5305

<u>Date</u> <u>D</u> <u>Ch</u> <u>Topic</u>	<u>No. Laboratory Exercise</u>
<u>Week 1: Cell Chemistry</u>	
4/3 W 1 Intro to Cells (Ch 1: 1-14)	<u>Data Presentation and Analysis</u> 1 Rectangular Coordinate Graphs (5)
4/5 F 2 Cell Chem. (Ch 2: 7-40)	
<u>Week 2: Cells, Organelles, Bioenergetics</u>	
4/8 M 3 Macromolecules (3:43-73)	<u>Microscopy and Spectrophotometry</u> 2 Experimental Calculation (5); PPT demo 3 Light Microscopy (5)
4/10 W 4 Cells and Organelles (4:78-105)	
4/12 F 5 Bioenergetics (5:110-130)	
<u>Week 3: Proteins, Enzymes & Membranes</u>	
4/15 M 6 Proteins & Enzyme Function (6:134-159)	<u>Cell Biology Techniques</u> 4 Spectrophotometry (5) 6 Active vs. Passive Transport (10)
4/17 W 7 Membranes Structure (Ch. 7: 164-196)	
4/19 F 8 Mem. Transport (Ch. 8: 201-227)	
<u>Week 4: Intracellular Structure and Function</u>	
4/22 M 9 Intracell. Compart. (12:329-370)	<u>Powerpoint Demo/Protein Isolation</u> 5 Cell Fractionation (10) 7 Protein Isolation (10)
4/24 W Midterm I (60 points)	
4/26 F 10 Digestion, Glycolysis (13:376-401)	
<u>Week 5: Cell Metabolism: Flow of Matter & Energy</u>	
4/29 M 11 Respiration (14:405-446)	<u>Protein Analysis</u> 8 Estimation of Protein Content (10) 9 Protein Gel Electrophoresis (10); peas
5/1 W 12 Photosynthesis I (15:451-481)	
5/3 F 13 Photosynthesis II (15:451-481)	
<u>Week 6: Peroxisomes & Radiation Damage, Cytoskeleton</u>	
5/6 M 14 Peroxisome/Radiation (12:364-370;17:550-554)	<u>Cellular Photodamage</u> 10 Photoreactivated UV Injured Cells (10) 11 Photodynamic Sensitization (10)
5/8 W 15 Cytoskeleton (22:752-778)	
5/10 F 16 Cell Motility (23:781-812)	
<u>Week 7: Motility & Contraction</u>	
5/13 M 17 Cell Contractility (23:781-812)	<u>Nucleic Acid Extraction & Analysis*</u> 12 Nucleic Acid Extraction (10) 13 Estimation of Nucleic Acid Content(10)
5/15 W 18 Extracellular Structures; Junctions (11:299-325)	
5/17 F Midterm II (60 points)	
<u>Week 8: Cell-Cell Communication</u>	
5/20 M 19 Electrical Communication I (9:232-262)	<u>Cell Analysis</u> 14 Morphometric Analysis (10) 15 Electron Microscopic Analysis (10)
5/22 W 20 Electrical Communication II (9:232-262)	
5/24 F 21 Visual Transduction Pathways (10:266-296)	
<u>Week 9: Signal Transduction</u>	
5/27 M Memorial Day Holiday	<u>Photomicrography & Documentation</u> No Laboratory 16 Photomicrography/Image Process
5/29 W 22 Signal Transduction Pathways (10:266-296)	
5/31 F 23 Signal Transduction Pathways (10:266-296)	
<u>Week 10: Cell Defense & Pathology</u>	
6/3 M 24 The Immune System (Handouts)	<u>Student Presentations & Evaluation</u> 17 Student Powerpoint Presentations 18 Photodocumentation&Lab Clean-up
6/5 W 25 Cell Cycle and Cancer (17:533-584)	
6/7 F 26 Cell Cycle and Cancer (17:533-584)	

Week 11: Final Exams Week

CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA

6/10 M **Cumulative Final Exam** (150 pts; Rm 3-128; 9:10 - 11:10 a.m.)

CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA

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Name (print) _____ Major: _____

Student ID# _____ Phone # _____ e-Mail: _____

Have you taken Bio 310 or any other Biochemistry or Molecular Biology course? _____

Have you taken Bio 115? _____ Organic chemistry? _____ Statistics? _____

What are your professional goals? _____

Indicate your level of expertise in the boxes below (0 = none, 1 = some, 2 = routine, 3 = expert):

Student name	PC	Mac	MS Word	Data-base	MS Excel	Inter-NET	HTML	Power-point	Group (leave blank)

Pre-Entry Exam (Not to be counted toward your grade):

1. Draw a typical prokaryotic cell and label all of its basic parts:

2. Draw a typical eukaryotic cell and label all of its basic parts: