

CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA

BIO 423: Cell Biology

Spring Quarter, 2000

Course Information Sheet (Syllabus)

| <u>CRN#</u> | <u>Subj</u> | <u>Crse</u> | <u>Sect</u> | <u>Course title</u> | <u>Units</u> | <u>Days</u> | <u>Time</u> | <u>Bldg</u> | <u>Rm</u> | <u>Instructor</u> |
|-------------|-------------|-------------|-------------|---------------------|--------------|-------------|-------------|-------------|-----------|-------------------|
| 28846 | BIO | 423 | 01 | Cell Biology | 3.0 | TR | 1000-1115 | 3 | 108 | Dr. G. Kageyama |
| 28847 | BIO | 423L | 01 | Cell Biology Lab | 2.0 | TBA | 1300-1550 | 8 | 34A | Kevin Franke |

Professor: Dr. Glenn H. Kageyama Office hours: MW 10:30-12 noon
8-129, (909) 869-5305 (leave voice mail message) TR 11:00-12 noon
e-mail: ghkageyama@csupomona.edu, ghkageyama@excite.com and ghkageya@uci.edu

Prerequisites: a. Biology 115, and preferably Biology 310, Biology 435 or equivalent
b. Chemistry, through Organic Chemistry
c. A proficiency in basic Biology, Chemistry and Physics

Required texts: a. Bozzola and Russell, Electron Microscopy, Jones & Bartlett Pubs., Boston

Suggested reading: a. Wolfe, Stephen L., Molecular and Cellular Biology, 4th Ed., 1993
b. Cell Biology Lecture Handouts, by Dr. Kageyama
c. Cell Biology Laboratory Handouts, by Kevin Franke

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

Course Objectives: To give students an exposure to basic principles of cell biology, 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 cell biology. Through a review

of the history of cell biology, 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 work assigned, and submit all laboratory reports on time as directed by the T.A..

Schedule of Exams: Two examinations: one midterm 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 ans-

wer 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, washing dirty glassware, taking care of instruments: minus 1-2 points/lab for infractions of good laboratory

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practice) will be integrated in the final grade for the lab. The maximum score for laboratory reports is 160 points + 20 points for attendance and laboratory performance, and 70 points for a laboratory group project.

| Lecture units (3.0) | | | Laboratory units (2.0) | | |
|----------------------------|------------|------|-------------------------------|------------|------|
| Midterm I | 75 points | 25% | Lab Reports + Performance | 180 points | 60% |
| Midterm II | 75 points | 25% | Laboratory quizzes (5/6) | 50 points | 17% |
| Final Examination | 150 points | 50% | Laboratory PPT project | 70 points | 23% |
| Total | 300 points | 100% | Total | 300 points | 100% |

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Lecture/Lab Schedule

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

| Date | D | Ch | Topic | No. | Laboratory Exercise |
|--|----|----|------------------------------------|--|--|
| <u>Week 1:</u> | | | | <u>Compound Light Microscopy</u> | |
| 3/28 | T | 1 | Historical Origins of Cell Biology | 1 | The Compound Light Microscope |
| 3/30 | Th | 2 | Types of Cells | 2 | Survey of Light Microscopy |
| <u>Week 2:</u> | | | | <u>Light Microscopy Techniques</u> | |
| 4/4 | T | 3 | Cell Biology Techniques | 3 | Specimen Prep.; Gel-coating slides |
| 4/6 | Th | 4 | Cell Membranes | 4 | Tissue Sectioning and Staining |
| <u>Week 3:</u> | | | | <u>Tissue Staining Techniques</u> | |
| 4/11 | T | 5 | Membrane Proteins | 5 | Photomicroscopy |
| 4/13 | Th | 6 | Membrane Transport | 6 | Photomicrograph printing |
| <u>Week 4:</u> | | | | <u>Advanced Microscopy Techniques</u> | |
| 4/18 | T | 7 | Endomembrane System | 7 | Lab Practicum I |
| 4/20 | Th | 8 | Bulk Transport | 8 | Advanced staining/labeling techniques |
| <u>Week 5:</u> | | | | <u>Introduction to Electron Microscopy Prep.</u> | |
| 4/25 | T | 9 | Cytoskeleton | 9 | Preparation of solutions; Tissue prep. I |
| 4/27 | Th | 10 | Cell Motility | 10 | Completion of Tissue Processing |
| <u>Week 6:</u> | | | | <u>Tissue Sectioning for Electron Microscopy</u> | |
| 5/2 | T | 11 | Cell Contractility | 11 | Preparation of glass knives: Semithins |
| 5/4 | Th | 12 | Cell Junctions | 12 | Ultramicrotomy: Thin sections |
| <u>Week 7:</u> | | | | <u>Introduction to the Zeiss 10C TEM</u> | |
| 5/9 | T | 13 | Neuron Structure | 13 | Safety Review and Guided tour |
| 5/11 | Th | 14 | Synapse Structure | 14 | Overview of Zeiss 10C controls |
| <u>Week 8:</u> | | | | <u>Electron Micrography</u> | |
| 5/16 | T | 15 | Extracellular Matrix | 15 | Electron Micrography |
| 5/18 | Th | 16 | Cell Walls | 16 | Photographic processing |
| <u>Week 9:</u> | | | | <u>Photomicrographic Portfolio</u> | |
| 5/23 | T | 17 | Nuclear Structure | 17 | Photomicrographic Portfolio |
| 5/25 | Th | 18 | Chromosome Structure | 18 | Scanning and Powerpoint Presentation |
| <u>Week 10: Student Presentations & Evaluation</u> | | | | | |
| 5/30 | T | 19 | Mitosis and Meiosis | 19 | Student Powerpoint Presentations |
| 6/1 | Th | 20 | Gametogenesis and Fertilization | 20 | Student Powerpoint Presentations |

Week 11: Final Exams Week

6/5 M **Cumulative Final Exam** (150 pts; Rm 3-128; 9:10 - 11:10 a.m.)

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Biology 435:
Cellular Physiology

Spring, 2000

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: