MOLECULAR NEUROBIOLOGY AND NEUROCHEMISTRY – MCB 165
Department of Molecular and Cell Biology - University of California, Berkeley
Winter/Spring Semester 2010

Required texts:
Course Reader from Copy Central - 2560 Bancroft Way
The Double Helix by James Watson (1968)

• the Norton Critical Edition (1980), edited by Gunther Stent, is the recommended version of this book, as it contains an outstanding historical synthesis by former UCB MCB Professor Gunther Stent, as well as many other interesting essays and reviews

The Stent edition of The Double Helix is available for purchase at campus bookstores. Copies are also available on reserve in the Biosciences Library in VLSB.

Two Lectures and one optional Discussion Section meeting each week.

Lecture times: Tuesday and Thursday at 5:00 - 6:30 pm - 2060 VLSB
Instructor: David Presti 249 Life Sciences Addition (LSA)
phone and voicemail: 643-2111 <presti@berkeley.edu>
Office hours: Tuesday 1:00-1:30 pm, Wednesday 1:30-2:00 pm, Thursday 3:00-3:30 pm
I will also generally be available after each lecture.

Weekly discussion sections: Wednesday 4:00-5:00 pm, 2070 VLSB
Wednesday 6:00-7:00 pm, 2030 VLSB

Graduate Student Instructor (GSI): Maya Cano <mcano@berkeley.edu>

Website: http://mcb.berkeley.edu/courses/mcb165/

• Probable topics to be covered, in approximate order of appearance, together with corresponding references items in the Course Reader:

• levels of description, evolution and tinkering
• pharmacology, membranes, blood-brain barrier
• neuron, synapse, receptors, reuptake, affinity, nervous systems
• molecular biology history
• glutamate, excitotoxicity
• glia
• alkaloids, caffeine, adenosine
• GABA, glycine, sedative-hypnotics, general anesthetics
• abuse, addiction, controlled substances
• absinthe, thujone, competitive and noncompetitive antagonists
• acetylcholine, anticholinergics, tobacco, nicotine, curare, arecoline
• acetylcholinesterase, AChE inhibition, organophosphates
• monoamine neurotransmitters
• amphetamine, ephedrine, cocaine, DAT

6,7 8,9,10 4,5 11,12 12,13,14 15,16,17 18 19 20 21 22 23,24
• Parkinson’s disease, dopaminergic neurotoxicity
• serotonin, histamine, trace amines
• psychosis, schizophrenia
• mood disorders
• opioid neurochemistry, neuropeptides
• salvinorin, kappa-opioid receptor
• psychedelic / hallucinogenic drugs
• methylenedioxyamphetamine
• cannabinoid receptor, endocannabinoids, retrograde signaling
• capsaicin, menthol, thermoreception
• nitrous oxide, mind-body problem

Prerequisites: Biochemistry and sufficient familiarity with the basics of cell biology and neurophysiology are required. It is recommended that you have taken, or are concurrently taking, MCB 160. For those needing additional background or review in cellular and molecular neurobiology, it is recommended to look at relevant chapters in Principles of Neural Science by Kandel, Schwartz, and Jessell. Copies of this book are on reserve in the Biosciences Library in VLSB (under the course heading of MCB 160). The more background you have in neuroscience before taking MCB 165, the more you will get from this course!

Grading: Your grade in the class is based on exam performance (approximately 80% of your grade) and a research paper and associated homework (approximately 20%).

Although the homework contributes only about 20% of your grade, turning in an acceptable research paper and the associated homework is required to pass the course. That is, not turning in an acceptable research paper and all of the associated homework will result in a failing grade, irrespective of how well you do on the exams. If you are taking the course P/NP, you must turn in an acceptable term paper in order to receive a passing grade. The research paper assignments are required in this way because we believe them to be an extremely important component of the learning in this class.

Your letter grade in the course will be determined according to absolute standards of performance, which hopefully relate to your acquisition of knowledge and understanding of the material. You will not be competing against fellow students in the sense that we do not force letter grades to conform to a predetermined distribution. If everyone does extremely well, everyone could receive an “A” grade. If everyone does poorly (highly unlikely), then everyone could get a low grade. Rather than devoting energy to worrying about where grade cut-offs are, if you are truly interested in this subject and in getting the most from this class, we urge you to study seriously from the beginning, do the readings, and truly make an effort to learn the material. You will be rewarded with deep knowledge and understanding of some really fascinating topics. Good grades will be a natural side effect.

Exams: Exams will consist of a combination of different types of questions: multiple-choice, short-answer, and essay. Each midterm exam covers the preceding portion of the course and draws from materials in the lectures and readings. The final exam is comprehensive and covers material from the entire semester. Study guides will be provided and review sessions will be conducted prior to each of the exams. There will be no surprises or trick questions. Our desire is for you to do well on the exams.
• dates for the two midterm exams, final exam, homework, and term paper
• midterm exams will take place in 2060 VL5B at 5 pm, the usual class time
• mark your calendars now; the days and times of these exams will not be changed
  • Midterm Exam I is on Thursday February 25 at 5:00 pm
    • this exam will cover course material from lectures Jan 19 through Feb 23, and corresponding material from the reader
    • this exam will also cover material from The Double Helix (edited by Gunther Stent), from the very beginning of the book through page 158
  • Midterm Exam II is on Thursday April 15 at 5:00 pm
    • lecture and reader material, March 2 through April 13
  • Final Exam is on Friday May 14 at 11:30 am (Exam group 18)
    • lecture and reader material for the entire semester
• there will be no make-up exams
  • if you miss an exam, you will receive zero points for that exam
  • if you miss a midterm exam with a credible excuse (e.g., significant medical problem documented with verifiable documentation, submitted in person to course instructor), then your final exam will count proportionally more in determining your course grade
  • if you miss the final exam with a credible excuse, you will receive an incomplete (I) grade for the course (provided you have passing status in the class prior to the exam, otherwise grade = F); it may be necessary to wait until the next time the class is given to resolve the incomplete grade

Homework:
• detailed guidelines for the research paper are found in the MCB 165 Course Reader
• read and follow them carefully
• the research paper will be due sometime in April; the exact date will be provided shortly
• detailed instructions for the associated homework will be provided shortly
• these assignments will involve locating and describing reference material that you are using in researching your paper and anonymous reviewing of one another’s papers - useful and enjoyable projects!
• The quality of your research paper is likely to be greatly enhanced by working on it slowly over time, rather than frantically producing something at the last minute.

E-mails: I prefer in-person contact to e-mail for most communications. Toward this end, I hold office hours three days a week and am generally available following each lecture for questions and discussion. Questions of importance or ones that require detailed answers must be addressed in person. In particular, in most circumstances, I am unlikely to respond to e-mail inquiries concerning grades. Most questions about grades need to be addressed in person. E-mail is a wonderful tool and very convenient. However, it is not a substitute for direct personal contact, especially when such contact is easy.

• important astronomical dates and days of ancient ritual:
  New Moons: January 14, February 13, March 15, April 14, May 13, June 12, July 11, August 9
  Full Moons: January 29, February 28, March 29, April 28, May 27, June 26, July 25, August 24
  Spring Equinox: March 20
  Beltane: May 1
  Summer Solstice: June 21

• reference for lunar and solar information:
  • <aa.usno.navy.mil> Astronomical Applications Department of the US Naval Observatory

Best wishes for a very enjoyable semester together!