

## CELLULAR AND MOLECULAR NEUROSCIENCE

Spring Semester, 2007: TTH 10:40-11:55

This course is a cellular and molecular course, with a focus on the cellular processes which underly the structure and function of neurons. The course is jointly coordinated between ASU (Dr. Helms Tillery and Dr. Smith) and the Barrow Neurological Institute (Dr. Vu).

Readings will be drawn from From Molecules to Networks: An Introduction to Cellular and Molecular Neuroscience, by Byrnes and Roberts. In the syllabus it is referred to as *BR*, along with papers from the primary and review literature.

Grades will be based on the following determinations:

- 30% - 1 Midterm Exam
- 30% - 1 Final Exam
- 40% - 1 Paper on a cellular/molecular pathology
  - 10% - review of two classmates papers
  - 10% - response to classmates' reviews
- 80% - Final revised paper
  - 50% - Review of existing literature
  - 50% - Development of proposed treatment

These items are approximate in that all items requested or assigned will contribute to your final grade in the course.

Please carefully read the syllabus, as you are responsible for the contents.

### Tentative Lecture Schedule

Date	Topic	Readings	Instructor
Week 1			
January 16	Introduction to Nerve Cells	BR 1	Smith (SoLS)
January 18	History of Neuroscience	BR 1	Smith (SoLS)
Week 2			
January 23	Transcription	BR 13	Scheck (BNI)
January 25	Protein manufacture and trafficking	BR 2	Kuo (BNI)
Week 3			
January 30	Membrane biology 1 – lipid bilayer, intrinsic proteins	BR 2, Nature Reviews (see Blackboard)	Chandler (SoLS)
February 1	Membrane biology 2 – Exocytosis, Endocytosis, membrane fusion	BR 2, Papers on Blackboard	Chandler (SoLS)
Week 4			

February 6	Membrane potential 1: membrane properties	BR 5	Helms Tillery (HDBE)
February 8	Membrane potential 2: Ion channels	BR 6	Chang (BNI)
Week 5			
February 13	Membrane potential 3: electrotonus	BR 4	Helms Tillery (HDBE)
February 15	Action potential	BR 7	Smith (SoLS)
Week 6			
February 20	Transmitter release, Classic transmitters	BR 8, BR 9	Smith (SoLS)
February 22	Mathematical approaches to cellular processes in neurons	BR 14	Crook (Mathematics)
Week 7			
February 27	Cellular Energetics	BR 3	J Valla (BNI)
March 1	Neurotransmitter receptors	BR 11	Lukas (BNI)
Week 8			
March 6	Neurochemical manufacture and packaging	BR 9	WJ Tyler (SoLS)
March 8	EXAM 1		
Week 9			
SPRING RECESS			
Week 10			
March 20	Synaptic transmission I	BR 12	WJ Tyler (SoLS)
March 22	Synaptic transmission II	BR 15	WJ Tyler (SoLS)
Week 11			
March 27	Synaptic plasticity and learning	BR 16, BR 18	Valla (BNI)
March 29	S, P, & L 2	BR 18	Vu (BNI)
Week 12			
April 3	Non-traditional transmission, retrograde signalling	BR 10	Lukas
April 5	Dendritic processing	BR 17	Duch (SoLS)
Week 13			
April 10	Calcium imaging		Chandler (SoLS)
April 12	Neuronal development	Papers on Blackboard	Vallejo (BNI)
Week 14			
April 17	Developmental Brain Disorders	Papers on Blackboard	Narayanan (BNI)
April 19	Neuroimmunology		Steve Hoffman

Week 15			
April 24	Presentations 1		
April 26	Presentations 2		
Week 16			
May 1	Autoimmune Disorders in CNS	Papers on Blackboard	Vollmer/Shi (BNI)
<b>Finals Week</b>	<b>Exam 2</b>		

**Exam Policies:**

Exams will focus on material discussed in lecture or on readings that are specifically designated. Make-up exams will be administered only in the case of: 1) documented medical emergencies or catastrophes, or 2) interviews for graduate or professional schools, or attendance at professional meetings, if approved by the instructors in advance of the exam.

**Cellular & Molecular Neuroscience on Blackboard:**

The course syllabus, lecture schedule, lecture notes, additional readings, discussion boards, and various announcements will be posted online using Blackboard. This is an essential resource for this course so get familiar with it as soon as possible. Access to the course on Blackboard is via myASU: <https://myasucourses.asu.edu/>. If you are enrolled in the course, you should automatically be enrolled for Fall 06. If you are enrolled but do not see BME 598, see Dr. Helms Tillery ASAP.

**University Withdrawal and Incomplete Policies:**

The unrestricted withdrawal deadline is March 30 (in person) or April 1 (online). University and course policy states that after May 1, withdrawals (and a grade of W) will be given only to students with documented medical problems or personal issues warranting a compassionate withdrawal. A grade of Incomplete (I) is given when a student cannot complete a course due to health problems or other emergencies and has a passing grade; incompletes must be completed within a year. Incompletes will not be given because of poor grades.

**Academic Dishonesty:**

For the purposes of this course, any effort at deception regarding efforts in the class will be considered as cheating. Obvious examples include copying on exams and unacknowledged use of outside sources in preparing papers. Less obvious examples include pretended use of outside materials and false statements regarding attendance. When individuals cheat to elevate their scores, this can (a) lower the grades of honest, hard-working students and (b) establish a pattern of behavior that we wish neither to promote nor condone in graduates from ASU. Therefore, we will not tolerate cheating. Violations of the Student Code of Conduct are subject to university discipline. Action may include a zero for an exam, a grade of "E" in the course, or referral to the Fulton School of Engineering or College of Liberal Arts and Sciences, as appropriate, for more severe action such as suspension or a final grade of "XE" which appears on official and unofficial transcripts with a notation reading "failure due to academic dishonesty."