

NEURL-UA 211 (formerly V80.0210)
Fall 2014
Cellular and Molecular Neurobiology

Instructors:

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TA:

TBA

Recitations: Tuesdays, 12:30-1:45 and 4:55-6.10

Schedule:

Lectures will be held in room 815, Meyer, Mon and Wed, 11-12:15

Laboratories will be held in room 612 Silver Bldg, Wed, 2-6

The following books are recommended and on reserve:

Fain: Molecular and Cellular Physiology of Neurons (AP, 1999)

MQ: Meyer and Quenzer, Psychopharmacology: Drugs, the Brain and Behavior, 2nd Edition (Sinauer, 2012)

Zigmond, Bloom, Landis, Roberts & Squire: Fundamental Neuroscience (AP, 1999)

Cooper, Bloom & Roth, The Biochemical Basis of Neuropharmacology (Oxford 1995)

Peters, Palay and Webster, Fine Structure of the Nervous System

Articles will be assigned at a later date.

Exams and Grading:

There will be two 2-hour exams and two 1-hr quizzes. The first one hour quiz and two hour exam will count for 20% and 25%, respectively, of the final grade and will cover material taught through September and October. The homework assignments from this period will count for 5% of the final grade. The second one-hour quiz will count for 20% of the final grade and the final exam will count for 25% of the final grade. Another 5% of the final grade will be based on class participation during the months of November and December.

NEURL-UA-211 Cellular & Molecular Neurobiology – Lecture Series

Date	Instructor	Description	Reading
Sept 3 W	Reyes	Introduction: The cell biology of neurons	Fain 1
Sept 8 M	Reyes	Passive electrical membrane properties	Fain 2
Sept 10 W	Reyes	The resting membrane potential <i>Problem Set #1</i>	Fain 3
Sept 15 M	Reyes	The action potential I: Hodgkin-Huxley experiments	Fain 5
Sept 17 W	Reyes	The action potential II: Hodgkin-Huxley experiments <i>Problem Set #2</i>	Fain 5
Sept 22 M	Reyes	Ion Channels 1: diversity	Fain 6
Sept 24 W	Reyes	Quiz on materials from Sept. 8 to Sept. 17 (20%)	
Sept 29 M	Reyes	Ion channels II: physiology/Structure <i>Problem Set #3</i>	Fain 6
Oct 1 W	Reyes	Axons: conduction of Action Potentials	Fain 7
Oct 6 M	Reyes	Dendrites: Active properties	Fain 2 + Articles
Oct 8 W	Reyes	Synaptic transmission I: pre-synaptic mechanisms <i>Problem Set #4</i>	
Oct 13 M	Reyes	No Class – Fall Break	Fain 9
Oct 15 W	Reyes	Synaptic transmission II: post-synaptic mechanisms	Fain 8
Oct 20 M	Reyes	From Synapse to Action Potentials: Putting it all together	Articles
Oct 22 W	Reyes	Midterm – Covers material from Sept 8 to Oct 20 (25%)	
Oct 27 M	Aoki	Glutamate I: receptors, excitation, and signaling	MQ 8 Articles
Oct 29 W	Aoki	GABA: receptors, anxiety, and epilepsy	MQ 8 & 18 Articles
Nov 3 M	Aoki	Acetylcholine: receptors, nicotine/addiction and neuromuscular disease	MQ 7 and 13 Articles
Nov 5 W	Aoki	Dopamine: receptors, Parkinson's disease, and schizophrenia	MQ 5, 12 and 20 (suggested) Articles
Nov 10 M	Aoki	Norepinephrine: receptors, vigilance, and stress	MQ 5 (suggested) Articles
Nov 12 W	Aoki	Ultrastructure of the nervous system	http://synapses.clm.utexas.edu/
Nov 17 M	Aoki	EM Demo - optional	
Nov 19 W	Aoki	Quiz on materials from Oct 27 to Nov 12 (20%)	
Nov 24 M	Aoki	Serotonin: receptors, depression, and aggression	MQ 6, 19 and 15 (suggested) Articles
Nov 26 W	Aoki	Opiates: receptors, peptides, and pain	MQ 8 and 9 (suggested) Articles
Dec 1 M	Aoki	Hormones, mood swings and the hippocampus	Articles
Dec 3 W	Aoki	Review: Excitatory synapses. Synaptogenesis, LTP, LTD, excitotoxicity	Articles, MQ7
Dec 8 M	Aoki	Review: Amblyopia, ocular dominance plasticity and the role of GABA, GLU and NE	Articles
Dec 10 W	Aoki	Review: Cellular and molecular biological techniques that reveal connectivity	Articles

Dec 15 M	Aoki	<i>Final – covers material from Oct 27 to Dec 10 (25%)</i>	
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