

NEURL-UA 211
Fall 2016
Cellular and Molecular Neurobiology

Instructors:

Prof. Alex Reyes, 1057A Meyer
Phone: 212-998-3994
ar65@nyu.edu
Office hours: By Appointment

Prof. Chiye Aoki, 1056 Meyer
Phone: 212-998-3929
ca3@nyu.edu
Office hours: By Appointment

TA:

Lecture: [Chris Shooner, crs359@nyu.edu](mailto:crs359@nyu.edu);
Vasilios Koulouris, vk714@nyu.edu

Schedule:

Lectures will be held in 815 Meyer, Mon & Wed, 11-12:15 (Tues, Dec13, 11-12:15)

Textbooks:

The following books are recommended and on reserve:

Fain: Molecular and Cellular Physiology of Neurons (AP, 2014)

Available free online at <http://www.degruyter.com/viewbooktoc/product/430001>
when accessed through NYU.

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 one 2-hour exam and three 1-hr quizzes. The first and second one hour quizzes will each count for 22.5% of the final grade and will cover material taught through September and October. For the first half, there will also be homework assignments, which will count for 5% of your final grade. The third 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. If you miss an exam for any reason, you must take a make-up exam within a week. Please note that the make-up exam will be much more difficult than the in-class exam. The grading scale will be as follows (grade: min. %):

A:95%, A-: 90%, B+: 87%, B: 83%, B-:80%, C+:77%, C:73%, C-:70%, D+:67%, D:63%

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

Date	Instructor	Description	Reading
Sept 7 W	Reyes	Introduction: The cell biology of neurons	Fain 1
Sept 12 M	Reyes	Passive electrical membrane properties	Fain 2
Sept 14 W	Reyes	The resting membrane potential <i>Problem Set #1</i>	Fain 3
Sept 19 M	Reyes	The action potential I: Hodgkin-Huxley experiments	Fain 5
Sept 21 W	Reyes	The action potential II: Hodgkin-Huxley experiments <i>Problem Set #2</i>	Fain 5
Sept 26 M	Reyes	Ion Channels 1: diversity	Fain 6
Sept 28 W	Reyes	Quiz on materials from Sept. 9 to Sept. 21 (20%)	
Oct. 3 M	Reyes	Ion channels II: physiology/Structure	Fain 6
Oct 5 W	Reyes	Axons: conduction of Action Potentials <i>Problem Set #3</i>	Fain 7
Oct. 10 M	No classes	Columbus Day	
Oct 12 W	Reyes	Dendrites: Active properties	Fain 2 + Articles
Oct 17 M	Reyes	Synaptic transmission I: pre-synaptic mechanisms <i>Problem Set #4</i>	Fain 9
Oct 19 W	Reyes	Synaptic transmission II: post-synaptic mechanisms	Fain 8
Oct 24 M	Reyes	From Synapse to Action Potentials: Putting it all together <i>Problem Set #5</i>	Articles
Oct 26 W	Reyes	Midterm – Covers material from Sept 9 to Oct 24 (20%)	
Oct 31 M	Aoki	Glutamate: receptors, excitation and signaling	MQ 8 and articles
Nov 2 W	Aoki	GABA: receptors, anxiety, sleep and epilepsy	MQ 8, MQ18 and articles
Nov 7 M	Aoki	Acetylcholine: receptors, nicotine addiction, Alzheimer's disease and NMJ diseases	MQ 7, MQ13 and articles
Nov 9 W	Aoki	Norepinephrine: receptors, vigilance and stress	MQ5 and articles
Nov 14 M	Aoki/TA	Review session – go over homework material	
Nov 16 W	Aoki/TA	Quiz on material from Nov 2 to 14	
Nov 21 M	Aoki	Dopamine: receptors, Parkinson's disease, schizophrenia and addiction	MQ5, MQ12, MQ20 (suggested) and articles
Nov 23 W	Aoki	Hormones, mood swings and the hippocampus	Articles
Nov 28 M	Aoki	Neuropeptides: receptors, hunger and pain	MQ8, MQ9 (suggested) and articles
Nov 30 W	Aoki	Serotonin: receptors, depression and aggression	MQ6, MQ19, MQ15 (suggested) and articles
Dec 5 M	Aoki	Fine structure of neurons and glia	MQ2 and articles and http://synapses.clm.utexas.edu
Dec 7 W	Aoki	Application of basic knowledge towards research topics: Excitatory synapses. Synaptogenesis, LTP, LTD, excitotoxicity	Articles, MQ7
Dec 12 M	Aoki	Application of basic knowledge towards research topics: Amblyopia, ocular dominance plasticity and the role of GABA, GLU and NE	Articles
Dec 13 T	Aoki	Application of basic knowledge towards research topics: Cellular and molecular techniques that reveal connectivities within brain	MQ2, MQ3 and Articles
Dec 14 W	Aoki	Review session	
Dec 19 M	Aoki	Final Exam – Covers material from Oct 31 to Dec 14	