# NEURL-UA 210 Cellular and Molecular Neurobiology (CMNB) Lecture Series 2019

#### Instructors:

Prof. Adam Carter Phone: 212-998-3882 Email: agc5@nyu.edu Office hours in Meyer 631: M 12:45-1:45 & W 12:45-1:45 Prof. Chiye Aoki Phone: 212-998-3929 Email: ca3@nyu.edu Office hours in Meyer 1056: W 12:45-1:45 & Th 2:00-3:00

# TAs:

Eliot Levy (erl335@nyu.edu) Kasra Manoocherri (kmanoocheri@gmail.com) Recitations: Tues & Thurs, 12:30-1:45 in Meyer 636 and 4:55-6.10 in Meyer 760

#### Schedule:

Lectures will be held on Mon and Wed, 11:00-12:15 in Meyer 636 Laboratories will be held on Wed, 2:00-6:00 in Silver 612 or Meyer labs

#### The following textbooks are recommended:

Fain: Molecular and Cellular Physiology of Neurons (2014) (available online)

**MQ:** Meyer & Quenzer. <u>Psychopharmacology: Drugs, the Brain and Behavior</u> (2019) 20% discount available using promo code Venden2019 from <u>www.oup.com/us/he</u>

# **Supplemental Resources:**

**PPW:** Peters, Palay & Webster. <u>Fine Structure of the Nervous System</u> **FMQ:** Feldman, Meyer & Quenzer. <u>Principles of Neuropsychopharmacology</u> (1997) **Cajal:** Newman, Araque, Dubinsky, eds. <u>The Beautiful Brain: The Drawings of</u> <u>Santiago Ramon y Cajal</u> (2017)

# Exams and Grading:

There will be 4 exams (two in the first half, two in the second half, each worth 20% of the final grade). If you miss an exam for any reason, you must schedule and take a makeup within a week. A signed doctor's note is required for requesting any makeup.

There will also be weekly homework assignments, which together count for 20% of the final grade. Homework must be submitted at the beginning of the recitation session of the immediately following week. If homework is late, any earned points will be halved.

The grading scale is as follows (grade: minimum %):

A:93%, A-:90%, B+:87%, B:83%, B-:80%, C+:77%, C:73%, C-:70%, D+:67%, D:63%

# NEURL-UA-210: Cellular & Molecular Neurobiology – Lecture Series 2019

Date	Instructor	Description	Reading
Sept 4 W	Carter 1	Introduction	Fain 1
Sept 9 M	Carter 2	Passive membrane properties	Fain 2
Sept 11 W	Carter 3	Membrane potentials Homework #1 assigned	Fain 3
Sept 16 M	Carter 4	Action potentials I: Hodgkin & Huxley experiments	Fain 5
Sept 18 W	Carter 5	Action potentials II: Hodgkin & Huxley experiments Homework #2 assigned	Fain 5
Sept 23 M	Carter 6	Ion channels I: Single channel recordings	Fain 6
Sept 25 W	Carter 7	Ion channels II: Structure / function Homework #3 assigned	Fain 6
Sept 30 M	Carter 8	Ion channels III: Diversity	Fain 7
Oct 2 W		Exam #1 – Covers material from Sept 4 to Sept 25	
Oct 7 M	Carter 9	Axons & dendrites	Fain 2
Oct 9 W	Carter 10	Synaptic Transmission I: Presynaptic Homework #4 assigned	Fain 8
Oct 14 M		No Class – Fall Recess	
Oct 15 Tu*	Carter 11	Synaptic Transmission II: Postsynaptic, Part 1	Fain 9
Oct 16 W	Carter 12	Synaptic Transmission III: Postsynaptic, Part 2 Homework #5 assigned	Fain 10
Oct 21 M	Carter 13	Synaptic & dendritic integration	Articles
Oct 23 W		Exam #2 – Covers material from Sept 30 to Oct 21	
Oct 28 M	Aoki 1	Cell biology of neurons	PPW, Cajal
Oct 30 W	Aoki 2	Diversity of neurotransmitter systems & synapses I: Glutamate and GABA Homework #6	MQ4, MQ8, MQ17, Fain 11
Nov 4 M	Aoki 3	Diversity of neurotransmitter systems & synapses II: ACh and peptides	MQ 7, MQ11, MQ13
Nov 6 W	Aoki 4	Diversity of neurotransmitter systems & synapses III: Norepinephrine & dopamine Homework #7	MQ5, MQ12, MQ19, Fain 11 and Fain 12
Nov 11 M	Aoki 5	Diversity of neurotransmitter systems & synapses IV: Serotonin	MQ6, MQ18
Nov 13 W	Aoki 6	Modulation of intrinsic properties and mini-review Homework #8	Fain 12 & Review articles
Nov 18 M		Exam #3 – Covers material from Oct 28 to Nov 13	
Nov 20 W	Aoki 7	Cell biology of glia	Review and research articles
Nov 25 M	Aoki 8	Synaptic plasticity I: Receptors Homework #9	QM 8, Fain 14
Nov 27 W		No Class – Thanksgiving Recess	
Dec 2 M	Aoki 9	Synaptic plasticity II: Transcription & translation	Review and research articles
Dec 4 W	Aoki 10	Synaptic plasticity III: Structure Homework #10	Review and research articles
Dec 9 M	Aoki 11	Development I: Neurogenesis & synaptogenesis	Research articles
Dec 11 W	Aoki 12	Development II: Developmental Plasticity	Research articles
Dec 16 M		Exam #4 – Covers material from Oct 28 to Dec 11	