

Cellular Neuroscience (NB&B 207) - Winter 2019

M,W,F 10:30 – 11:50 : 2246 McGaugh Hall

Instructors – Ian Parker (course coordinator) iparker@uci.edu, Gyuri Lur, glur@uci.edu,
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Grading Policy: Grades will be based on exams and take-home assignments

Text: There is no assigned text. Handouts and readings will be assigned during lectures.

Purves et al. "Neuroscience" can be used for introductory material. The 2nd edition is available free at <http://www.ncbi.nlm.nih.gov/books/NBK11103/>

Date Topic

Section #1 Membranes and Ion Channels (I.P.)

Jan 7 Introduction to electrical concepts
Jan 9 Passive electrical properties of membranes
Jan 11 Membrane potential, Nernst, Goldman equations
Jan 14 Ion channels – electrophysiology, patch clamping
Jan 16 Ion channels – voltage-gated channels
Jan 18 Ion channels – ligand-gated channels
Jan 21 **Martin Luther King Holiday**
Grade for section #1 is based on take-home assignments & exam

Section #2 Synaptic Transmission (G.L.)

Jan 23 Action potentials
Jan 25 The Hodgkin & Huxley Axon
Jan 28 Chemical synapses, quantal transmission
Jan 30 Ca²⁺ and neurotransmitter release, EPSPs and IPSPs
Feb 1 Slow synaptic potentials
Feb 4 Synaptic integration
Feb 6 Discussion/review
Feb 8 Section #2 **EXAM**

Section #3 Neurotransmitters, Receptors and Second Messengers (K.S.)

Feb 11 Neurotransmitters
Feb 13 Molecular mechanisms of neurotransmitter release
Feb 15 Neurotransmitter receptors
Feb 18 **Presidents Day Holiday**
Feb 20 Second messenger pathways #1
Feb 22 Second messenger pathways #2
Feb 25 Synaptic plasticity
Feb 27 Discussion/review
March 1 Section #3 **EXAM**

207L CELLULAR NEUROSCIENCE LABORATORY CLASS

35th Annual Edition --- March 4 - 14, 2019

All-day every day, but flexible scheduling.

Instructors: Ian Parker, Gyuri Lur, Ian Smith, Angelo Demuro

Experiments (March 4 – 12)

1. Compound action potential of sciatic nerve. (I.P.)
2. Intracellular recording from muscle – resting potential, miniature end-plate potentials. (I.P.)
3. Quantal analysis of transmitter release at the muscle endplate. (I.P.)
4. *Xenopus* oocytes: voltage clamp and Ca²⁺-dependent Cl⁻ currents evoked by IP₃ (A.D.)
5. Total internal reflection microscopy of Ca²⁺ signals in neuroblastoma cells (I.S.)
6. Extracellular field recording from rat hippocampal slices. (G.L.)

March 13: Preparation for presentations

March 14: Student presentations (Noon : pizza lunch provided)