

BISC 462, 2 units, Spring 2016
Seminar in Neurobiology
Neuromuscular Junctions in Health and Disease

General Description: This 2-unit seminar course is designed to introduce upper-level undergraduates and graduate students to the basic biology of the Neuromuscular Junction (NMJ) as well as diseases related to NMJs and the motor circuit. Diverse topics on synaptic function, development, maintenance, plasticity, and synapse-glia interactions, as well as diseases of NMJs and motor neurons will be covered. Although major focus is on the vertebrate, NMJs in worms and flies will also be examined. All students should have already taken basic undergraduate biological courses, preferably including BISC 421 (Neurobiology), or equivalent, prior to this class.

All students are expected to read each week two assigned papers: a review and a research paper. We will cover a total of 15 topics (see next page). In the first hour of each class, one student will provide an overview of the topic, including a brief history of that particular field, and discussion on earlier papers related to the assigned research paper. In the second hour, another student will present the assigned research paper in details, including the questions/issues, specific aims, methodology, experimental designs, and results, as well as lead the discussion on the hypotheses, significance and implications of the paper. Thus, every student should give two presentations for this course, one on an overview of one topic, another on a research paper of a separate topic. As part of the training, every student needs to find a research paper for his/her own presentation, but should consult with the instructor prior to the final choice. For each presentation, the presenter should use PowerPoint presentation, and email the instructor a PowerPoint file **by 5 PM on Tuesday** of the presenting week. The file will be uploaded to our course website by the following day. In addition to the two presentations, every student is expected to read the assigned papers thoroughly, think the issues critically, ask sharp questions, articulate the merits and weaknesses of each paper, and participate in lively discussion for each and every topic throughout the semester.

Instructor: Chien-Ping Ko, HNB 209, x09182, email: cko@usc.edu, office hours: Mondays 2-3 PM

Meeting Time and Place: 2-3:50 PM, Fridays, HNB 120

Grading:

1 st hr presentation (overview)	35 pts
2 nd hr presentation (research paper)	35 pts
Questions	20 pts
Class participation	10 pts
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	100 pts

Every student must submit (by clicking “Assignments” on Blackboard website) before each class 2 questions about the review or research paper being presented to be discussed each class.

Blackboard Website: <http://totale.usc.edu>, click on BISC 462

Reading:

- *The Neuromuscular Junction, a special issue in tribute to B. Katz.* C.-P. Ko and W.J. Thompson eds., 2003. *Journal of Neurocytology* 32: 421-1037.
- A reading list of review and research papers will be provided on Blackboard course website.

Topics and Presentation Schedule

1. **1/15 1st hr: Chien-Ping Ko** **2nd hr: Chien-Ping Ko**
Introduction: NMJs and motor circuit
2. **1/22 1st hr:** **2nd hr:**
Presynaptic function: transmitter release and vesicle recycling
3. **1/29 1st hr:** **2nd hr:**
Postsynaptic function: acetylcholine receptors and acetylcholinesterase
4. **2/5 1st hr:** **2nd hr:**
Synapse formation-presynaptic differentiation
5. **2/12 1st hr:** **2nd hr:**
Synapse formation-postsynaptic differentiation
6. **2/19 1st hr:** **2nd hr:**
Synapse elimination and maintenance
7. **2/26 1st hr:** **2nd hr:**
Synaptic degeneration and regeneration
8. **3/4 1st hr:** **2nd hr:**
Synaptic sprouting and plasticity
9. **3/11 1st hr:** **2nd hr:**
Synaptic homeostasis
- (3/18 *Spring Recess*)
10. **3/25 1st hr:** **2nd hr:**
Synapse-glia interactions
11. **4/1 1st hr:** **2nd hr:**
Myasthenic gravis and myasthenic syndrome
12. **4/8 1st hr:** **2nd hr:**
Duchenne Muscular Dystrophy
13. **4/15 1st hr:** **2nd hr:**
Spinal Muscular Atrophy (SMA) I: Disease mechanisms
14. **4/22 1st hr:** **2nd hr:**
Spinal Muscular Atrophy (SMA) II: Therapy Development
15. **4/29 1st hr:** **2nd hr:**
Amyotrophic Lateral Sclerosis (ALS)

Statement on Academic Conduct and Support Systems

Academic Conduct

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Section 11, *Behavior Violating University Standards*<https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions/>. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct/>.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the *Office of Equity and Diversity* <http://equity.usc.edu/> or to the *Department of Public Safety* <http://capsnet.usc.edu/department/department-public-safety/online-forms/contact-us>. This is important for the safety whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. *The Center for Women and Men* <http://www.usc.edu/student-affairs/cwm/> provides 24/7 confidential support, and the sexual assault resource center webpage sarc@usc.edu describes reporting options and other resources.

Support Systems

A number of USC’s schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the American Language Institute <http://dornsife.usc.edu/ali>, which sponsors courses and workshops specifically for international graduate students. The Office of Disability Services and Programs http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, USC Emergency Information <http://emergency.usc.edu/> will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.

Students with Disabilities. Any student requesting academic accommodations based on a disability is required to register with the Office of Disability Services and Programs (DSP, STU 301, 213-740-0776) each semester. You must deliver an approved DSP letter to the instructor as early in the semester as possible.

Disclaimer: It may be necessary to make some changes in the syllabus during the semester.