Dear Students:

Welcome to the MBL Summer Neurobiology Course! We are really looking forward to meeting you and teaching this summer. We will start the course off Sunday evening June 3 at 7:00 PM by having an informal dinner in the "Pit" (Loeb 28) of the Neurobiology course area so that we all have a chance to get to know each other. We will meet you in Swope in front of the registration desk at 6:45 PM.

The Neurobiology Course is organized into three sections, each lasting three weeks. The first section is Cellular Neurophysiology and Biophysics, followed by Imaging, and last (but not least), Molecular Neurobiology and Genetics. The faculty members for these sections are:

Cellular Neurophysiology and Biophysics

- Edwin McCleskey PhD, Vollum Institute, OHSU (Section Head)
- Alberto Pereda PhD, Albert Einstein College of Medicine
- Heather Wenk PhD, Gustavus Adolphus College
- James Galligan, PhD, Michigan State University
- Chris Honda, PhD, University of Minnesota
- John Williams, PhD, Vollum Institute
- Yulong Li, PhD, Stanford University
- Isabel Llano, PhD, University of Paris
- Alain Marty, PhD, University of Paris
- Junichi Yagi, PhD, Kyorin University

Imaging

- Mark Terasaki, PhD, University of Connecticut (Section Head)
- Katie Commons, Harvard Medical School
- James Galbraith, PhD, NIH/NICHD
- Kristina Micheva, PhD, Stanford Medical School
- Thomas Misgeld, PhD, Technical University Munich
- Thomas Oertner, PhD, Friedrich Miescher Institute
- Tom Reese, MD, NIH/NINDS
- Stephen Smith, PhD, Stanford Medical School
- Wesley Thompson, PhD, University of Texas Austin
- Josh Zimmerberg, PhD, NIH, NICHD

Molecular Neurobiology and Genetics

- Rae Nishi PhD, University of Vermont (Section Head)
- Matthew Dalva, University of Pennsylvania School of Medicine
- Elva Diaz, University of California, Davis
- Andrew Chisholm, University of California, San Diego
- Yishi Jin, University of California, San Diego
- Christine Beattie, Ohio State University
- Paul Henion, Ohio State University

The course runs 6 days per week from Mon – Sat. Generally, lectures will be in MRC 210 from 9:00 – 11:30 am with lab from 2:00 PM on through the evening. Enclosed with this letter, you will find a draft of the lecture schedule for all three sections. We encourage you to work hard and make the most of the course, but we also would like you to get enough sleep at night to be alert during morning lectures. Also, be sure to refresh yourselves Sat evening through Sun by taking a break from the course and enjoying Cape Cod and the Islands.

If you have any questions, please feel free to contact either one of us.

Sincerely,

Ed McCleskey (mccleske@ohsu.edu) and Rae Nishi (rnishi@uvm.edu)
Co-Directors

NEUROBIOLOGY, 2007

June 4 – June 22	Electrophysiology
June 25 – July 13	Imaging
July 16 – July 28	Molecular

Cellular Neurophysiology and Biophysics (aka Electrophysiology)

Lectures *(9:00 am- 11:00 am with 10 min break)*

June 4	Bioelectricity Basics	Lab Faculty
June 5	Bioelectricity Basics	Lab Faculty
June 6	Bioelectricity Basics	Lab Faculty
June 7	Ion channels	Chris Miller
June 8	Structure deduced from function	Clay Armstrong
June 9	Review session	Kamran Khodakhah
June 11	Ion channel structure	Rod MacKinnon
June 12	Basics of synaptology	Dwight Bergles
June 13	Central synapses and channels	Jeff Magee
June 14	LTP/LTD	John Lisman
June 15	Hearing	Elisabeth Glowatzki
June 16	Artifact-of-the-Year Award	Lab TA's
June 17	All course brunch (9:45-11:00 am, Swope cafeteria)	
June 18	Carriers and pumps	Paul DeWeer
June 19	Electrical synapses	Barry Connors
June 20	Perspectives from a career	Rodolfo Llinas
June 21	Fruit Fly Fight Club	Ed Kravitz
June 21	Kravitz Lecture (8 pm)	John Hildebrand
June 22	student presentations	(1 pm, Loeb 25)
June 23	History of Neuro course (6 pm)	Michael Bennett

Daily Schedule

Lectures and associated discussion are from 9-12 am, Monday through Friday. Lab typically starts 2 hours after lecture and proceeds late into the night. Saturday sessions start at 10 am and end at dinner. The lab is Loeb room 25. Lectures are in Marine Resources Center, room 210. The Monday Night Fights seminar series (8 pm Mondays, Whitman auditorium) is required; other seminars are optional.

Lab Stations

Students do 7 days of rotations, one day at each of the 7 different electrophysiology rigs. Starting on June 13, they do a focused project on one of the rigs. Results from projects are presented in short talks on the afternoon of June 22. The seven preparations and faculty are: visualized brainstem slice (John Williams, Vollum Institute); visualized cerebellar slice (Isabel Llano and Alain Marty, University of Paris); squid giant synapse (Yulong Li, Stanford University); goldfish Mauthner cell (Alberto Pereda, Albert Einstein School of Medicine); mammalian skin-nerve

recording of mechano and thermosensors (Chris Honda, University of Minnesota and Heather Wenk, Gustavus Adolphus College); enteric nervous system sharp electrode recording (Jim Galligan, Michigan State University); dissociated cell patch clamp (Junichi Yagi, Kyorin University). Ed McCleskey (mccleske@ohsu.edu) is section head.

IMAGING

Lectures *(9:00 am- 12 noon with 30-45 min break)*

June 25	Introduction to light microscopy I	Jeff Lichtman
June 26	Introduction to light microscopy II	Jeff Lichtman
June 27	Calcium imaging	Thomas Oertner
June 28	Introduction to electron microscopy	Tom Reese
	Immunolabeling in EM	Katie Commons
June 29	Detectors / Nomarski	Stephen Smith
June 30	Non-linear microscopy (afternoon)	Winfried Denk
	Extreme 3D Festival (evening)	Denk, Smith, Lichtman, Reese
July 2	Serial thin section electron microscopy	Kristen Harris
July 3	In vivo imaging of dendrites	Yi Zuo
July 4	Fourth of July Parade	
July 5	Classic and modern histotechniques	Thomas Misgeld
July 6	Light stimulation techniques	Thomas Oertner
July 9	Glia	Wes Thompson
July 10	FRET and FLIM	Ryohei Yasuda
July 11	Modeling of vesicle transport	Boris Slepchenko
July 12	Membrane fusion	Josh Zimmerberg
July 13	Student Presentations	

(The lecture schedule for the 2nd and 3rd weeks is still being fine tuned, so there may be some switching of dates.)

During the afternoons and evenings of the first week, you will rotate through the various light and electron microscope set ups, and will be exposed to possible independent projects. Projects will be decided on Saturday morning, and you will work on these for the second and third weeks, with a presentation on the last day. The major preparations available in this section will be zebrafish, various transgenic GFP mice, brain slice, and neuroblastoma cultured cells, though it is very feasible to work with other preparations. There will be two multiphoton microscopes in the course, one home built and the other commercial. Electron microscopy is fully supported. There will be a special event on Saturday evening of the first week, where three innovators of massive 3D reconstruction will discuss their different approaches.

Molecular Neurobiology and Genetics (aka Molecular)

Lectures *(9:00 to 11:00 am with 10 min break)*

July 16	Meet the faculty, their research, and their projects	Faculty
	Monday Night Seminar	Grae Davis
July 17	Genes, inheritance, mutagenesis and forward genetics	A. Chisholm
July 18	Comparing worms, flies and fish: discussion with faculty	
July 19	Analyzing gene expression in the nervous system	E. Diaz
July 20	Signal transduction	M. Dalva
July 21	Transfection and other delivery methods of genes & RNAi	Faculty
July 23	Human genetics	Louis Ptacek
	Monday night seminar Louis Ptacek or Ying-Hui Fu	
July 24	Forward and reverse genetics in mice	S. Ackerman
July 25	TBD	E. Jorgensen
July 26	Epigenetic Regulation of Gene Expression in the NS	G. Mandel
July 27	Brain disorders: triumphs and and tribulations	G. Fischbach
July 28	Student presentations	
	End of Course Party!	

Lab Projects
First two days will be for training in fundamental molecular techniques and to familiarize students with the possible preps and projects

Students will then choose a mentor for a lab project; preferably no more than two students per mentor

Jin and Chisholm will run nematode projects
Beattie and Henion will run zebra fish projects
Diaz will run a project isolating RNA from tissues and performing microarray analysis on spotted libraries
Dalva will run a project combining molecular biology and electrophysiology in cell culture