The Stanford Neurosciences Program
Handbook 2007-08
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Appendix

Table of Advancement to PhD
WELCOME TO STANFORD!

We all expect that your graduate training will be stimulating, your research fruitful, and your overall experience with colleagues and friends at Stanford enjoyable.

Although the formal requirements for a PhD degree are few, the administrative paperwork for properly processing your stipend and tuition payments, and for progressing through the various academic steps such as advancement to candidacy, completion of the oral exam, and submission of the completed dissertation can be tedious, if not confusing.

This handbook should help you obtain a PhD in the smallest number of steps. It details the requirements and guidelines set by the University and by the Neurosciences Program, which apply to the 2007-2008 entering class.

Those of you who have been in the program for more than a year will also find the handbook useful. It indicates which forms need to be submitted and when they are to be submitted.

In addition, the handbook has useful information about life at Stanford. It is unlikely to answer all of your questions. The Program Director, the Program Administrator, as well as your fellow students and your Program Committee Representatives, will help you with such questions as they arise.

Neurosciences is on the Internet. The home page can be found at:

http://neuroscience.stanford.edu/education/phd_program/

Neuroscience students have their own website, which will be more informative in some areas, and substantially more entertaining in all areas:

http://neurostudents.stanford.edu/
THE NEUROSCIENCES PROGRAM

HISTORY

The Neurosciences Program at Stanford is an interdisciplinary training program with a tradition of excellence in teaching and research. It was established in 1962 in order to coordinate the training of PhD candidates in the diverse areas of neuroscience. The Program consists of approximately 85 graduate students who are funded by a National Institute of Mental Health training grant, individual fellowships and research assistantships. There are approximately 90 faculty members with expertise in molecular neurobiology, developmental neuroscience, membrane excitability, cellular neuroscience, systems/behavioral neuroscience and computational neuroscience.

Program faculty are affiliated with 20 departments:

Anesthesia
Applied Physics
Bioengineering
Biological Sciences
Comparative Medicine
Developmental Biology
Electrical Engineering
Genetics
Microbiology and Immunology
Molecular and Cellular Physiology

Molecular Pharmacology
Neurobiology
Neurology and Neurological Sciences
Neurosurgery
Pathology
Pediatrics
Psychiatry and Behavioral Sciences
Psychology
Radiology
Structural Biology

Each of these departments contributes to the Program by offering courses and sponsoring seminars in the Neurosciences as well as providing the space and intellectual atmosphere for students to carry out their research. The range and quality of faculty expertise offer unique interdisciplinary training and research opportunities. A single campus includes both the Medical Center and the Departments of Biological Sciences and Psychology and facilitates close interactions between students, faculty and postdoctoral fellows.
PROGRAM OFFICES AND STAFF

The Program’s administrative office address is:

Neurosciences Program
Stanford University School of Medicine
300 Pasteur Drive, Alway Building, M-103D
Stanford, CA 94305-5121

The office is located within Suite M-105 of the Alway Building, in the School of Medicine.

Neurosciences Program Administrative Staff

John Huguenard
Director
Alway M-016
Mail Code 5122
Phone: 650.725.6666
Fax: 650.723.1080
Email: john.huguenard@stanford.edu

Ross Colvin
Administrator
Alway Building, M-103D
Mail Code 5121
Phone: 650.723.9855
Fax: 650.725.3867
Email: larkspur@stanford.edu

The Degree Progress Office, a division of the Office of the Registrar, oversees your program of study, to insure you are progressing in compliance with University requirements. Their address is:

Degree Progress Office
Office of the Registrar
630 Serra Street
Suite 120

Phone: 650.723.3056
Fax: 650.725.7248
Email: Registrar@stanford.edu
NEUROSCIENCES PROGRAM COMMITTEE

The Neurosciences Program Committee is responsible for setting policies and guidelines in all aspects of the Program.

<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
<th>Term</th>
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<tbody>
<tr>
<td>John Huguenard, Chairman</td>
<td>Neurology and Neurological Sciences</td>
<td>97-09</td>
</tr>
<tr>
<td>Corinna Darian-Smith</td>
<td>Comparative Medicine</td>
<td>02-08</td>
</tr>
<tr>
<td>Craig Garner</td>
<td>Psychiatry and Behavioral Sciences</td>
<td>03-07</td>
</tr>
<tr>
<td>Miriam Goodman</td>
<td>Molecular and Cellular Physiology</td>
<td>05-09</td>
</tr>
<tr>
<td>Shaul Hestrin</td>
<td>Comparative Medicine</td>
<td>04-08</td>
</tr>
<tr>
<td>Jennifer Raymond</td>
<td>Neurobiology</td>
<td>01-09</td>
</tr>
<tr>
<td>Kang Shen</td>
<td>Biological Sciences</td>
<td>05-09</td>
</tr>
<tr>
<td>Krishna Shenoy</td>
<td>Electrical Engineering</td>
<td>02-08</td>
</tr>
<tr>
<td>Anthony Wagner</td>
<td>Psychology</td>
<td>06-09</td>
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<tr>
<td>Name</td>
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<tr>
<td>John Huguenard</td>
<td>Neurology and Neurological Sciences</td>
<td>06-09</td>
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<tr>
<td>Tom Clandinin</td>
<td>Neurobiology</td>
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<tr>
<td>Miriam Goodman</td>
<td>Molecular and Cellular Physiology</td>
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<tr>
<td>Shaul Hestrin</td>
<td>Comparative Medicine</td>
<td>06-09</td>
</tr>
<tr>
<td>Susan McConnell</td>
<td>Biological Sciences</td>
<td>06-09</td>
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<tr>
<td>Richard Reimer</td>
<td>Neurology and Neurological Sciences</td>
<td>06-09</td>
</tr>
<tr>
<td>Krishna Shenoy</td>
<td>Electrical Engineering</td>
<td>06-09</td>
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STUDENT REPRESENTATIVES

Neurosciences student representatives organize student activities, including the annual Neurosciences Retreat, and represent student interests on the Program and Admissions Committees.

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<thead>
<tr>
<th>Name</th>
<th>Department</th>
<th>Term</th>
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</thead>
<tbody>
<tr>
<td>Emily Drabant</td>
<td>Psychology</td>
<td>06-08</td>
</tr>
<tr>
<td>Victoria Rafalski</td>
<td>Genetics</td>
<td>06-08</td>
</tr>
<tr>
<td>Jana Schaich Borg</td>
<td></td>
<td>07-09</td>
</tr>
<tr>
<td>Nathaniel Woodling</td>
<td>Neurology &amp; Neurological Sciences</td>
<td>07-09</td>
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JOURNAL CLUB REPRESENTATIVES

Neurosciences Journal Club representatives work with Assistant Professor, Ricardo Dolmetsch, to host the weekly journal club, plan professional development sessions, and schedule student presentations.

<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
<th>Term</th>
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<tbody>
<tr>
<td>Sonia Mayoral</td>
<td>Pediatrics</td>
<td>2007-2008</td>
</tr>
<tr>
<td>Hsing-Chen Tsai</td>
<td>Psychiatry &amp; Behavioral Science</td>
<td>2007-2008</td>
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SEMINAR SERIES REPRESENTATIVES

Neurosciences Seminar series representatives serve as the student voice in the planning and organization of the neuroscience seminar series.

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<thead>
<tr>
<th>Name</th>
<th>Department</th>
<th>Term</th>
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<tbody>
<tr>
<td>Brittany Burrows</td>
<td>Neurobiology</td>
<td>2006-2008</td>
</tr>
<tr>
<td>Laura Prolo</td>
<td>Neurology &amp; Neurological Sciences</td>
<td>2007-2009</td>
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NEUROSCIENCES PROGRAM WEBMASTER
<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rachel Kalmar</td>
<td>Neurobiology/Electrical Engineering</td>
<td>2007-2008</td>
</tr>
</tbody>
</table>
OMBUDSPERSON, SCHOOL OF MEDICINE

The School of Medicine’s Ombudsperson provides visitors with a “protected” environment in which to discuss a problem with the assurance that no action will be taken nor will the fact of the visit or anything the visitor says be disclosed to anyone. The position of Ombudsperson for the School of Medicine is currently vacant. Please contact the University Ombudsperson instead:

David Rasch  
585 Capistrano Way (Mariposa House), Room 210  
650.723.3682  
rasch@stanford.edu

NEUROSCIENCES STUDENT ADVOCATES

The following faculty members are available to provide confidential consultation and advice regarding laboratory or Program related issues.

<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
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<tbody>
<tr>
<td>Susan McConnell</td>
<td>Biological Sciences</td>
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<tr>
<td>Bill Mobley</td>
<td>Neurology and Neurological Sciences</td>
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ADMISSIONS COMMITTEE

<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
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<tbody>
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<td>Faculty</td>
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<tr>
<td>Russ Fernald, Chair</td>
<td>Biological Sciences</td>
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<tr>
<td>Anne Brunet</td>
<td>Genetics</td>
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<td>Craig Garner</td>
<td>Psychiatry and Behavioral Sciences</td>
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<tr>
<td>Ricardo Dolmetsch</td>
<td>Neurobiology</td>
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<tr>
<td>John Huguenard</td>
<td>Neurology and Neurological Sciences</td>
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<td>Brian Knutson</td>
<td>Psychology</td>
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<tr>
<td>Daniel Madison</td>
<td>Molecular and Cellular Physiology</td>
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<tr>
<td>Tirin Moore</td>
<td>Neurobiology</td>
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<tr>
<td>Tony Wyss-Coray</td>
<td>Neurology and Neurological Sciences</td>
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<tr>
<td>Student Representatives</td>
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<tr>
<td>Jana Schaich Borg</td>
<td></td>
</tr>
<tr>
<td>Nathaniel Woodling</td>
<td>Neurology and Neurological Sciences</td>
</tr>
</tbody>
</table>
**FACULTY AND RESEARCH INTERESTS**

**Katrin Andreasson, MD**  
*Assoc. Prof, Neurology & Neurological Sciences*  
kandreas@stanford.edu  
We are interested in understanding the mechanisms by which neurons die in neurodegenerative diseases. We focus on the cyclooxygenase-2 (COX-2) pathway, which is a central mediator of neuronal death in models of Alzheimer’s disease, ALS, and stroke. We are investigating the function of downstream prostaglandin receptor signaling pathways in mediating COX-2 dependent neuronal death. Our long-term goal is to understand the contribution of prostaglandin signaling to neuronal injury in a wide array of neurological diseases and to develop therapeutic strategies targeting these pathways in human disease.

**Stephen Baccus, PhD**  
*Assistant Professor, Neurobiology*  
baccus@stanford.edu  
Visual processing in neural circuits of the retina, studied using multielectrode extracellular array recording, intracellular recording, imaging, and computational modeling.

**Bruce Baker, PhD**  
*Professor, Biological Sciences*  
bruce.baker@stanford.edu  
Sex determination, sexual behavior, dosage compensation and imaginal disc development in Drosophila melanogaster, with the goal of understanding at a molecular level how these processes are brought about.

**Ben Barres, PhD**  
*Professor, Neurobiology*  
barres@stanford.edu  
Our lab is interested in the neuronal-glial interactions that underlie the development, function, and regeneration of the mammalian central nervous system.

**Helen Blau, PhD**  
*Professor, Microbiology and Immunology*  
hblau@stanford.edu  
Molecular and cellular mechanisms that control growth, differentiation, and apoptosis; protein-protein interactions in signal transduction; gene therapy for cardiovascular disease and cancer.

**Kwabena Boahen, PhD**  
*Associate Professor, Bioengineering*  
boahen@stanford.edu  
Our group has two synergistic goals: to understand how brains work, which will enable us to replace damaged neural tissue, and to build computers that work like brains, which will enable us to increase computational power a million-fold. To these ends, we model brains using an approach far more efficient than software simulation: we emulate the flow of ions directly with the flow of electrons—don’t worry, on the outside, it looks just like software.

**Lera Boroditsky, PhD**  
*Assistant Professor, Psychology*  
lera@psych.stanford.edu  
Language, cognition and perception; cross-linguistic differences in thought; effects of experience on cognition and perception; plasticity.

**Helen Bronte-Stewart, MD**  
*Associate Professor, Neurology & Neurological Sciences*  
hbs@stanford.edu

**Anne Brunet, PhD**  
*Assistant Professor, Genetics*  
anne.brunet@stanford.edu  
Our lab studies the molecular basis of aging, with an emphasis on the role of the nervous system in longevity. We use worms, fish, and mice to discover novel genes that regulate aging and to study the importance of these genes in the nervous system. We are
particularly interested in the role of longevity genes in preserving the adult neural stem cell pool and in preventing the decline in cognitive behaviors during aging. Our lab also explores if specific brain regions secrete factors that control the overall aging process.

Axel Brunger, PhD  
Professor, Molecular and Cellular Physiology  
brunger@stanford.edu  
Axel Brunger's goal is to understand the molecular mechanism of synaptic neurotransmission. He is particularly interested in the structure, function, and dynamics of key players in the synaptic vesicle fusion machinery. His lab is also working on the mechanism of action of clostridial neurotoxins that target this machinery. Other projects include the ATPases of the AAA family that are involved in protein complex disassembly and degradation. A molecular understanding of these complex protein machineries may ultimately lead to new therapeutics to treat human diseases.

Paul Buckmaster, PhD  
Associate Professor, Comparative Medicine  
psb@stanford.edu  
Mechanisms of epilepsy; circuitry of temporal lobe structures.

Pak Chan, PhD  
Professor, Neurosurgery  
phchan@stanford.edu  
Cellular and molecular mechanisms of cell death after ischemia, trauma and neurodegeneration using transgenic and knockout strategies.

Thomas Clandinin, PhD  
Assistant Professor, Neurobiology  
trc@stanford.edu  
Genetic and molecular mechanisms controlling the development of precise patterns of neuronal connections in the central nervous system. Functional dissection of neuronal circuits controlling visual behaviors in the fruit fly.

Corinna Darian-Smith, PhD  
Assistant Professor, Comparative Medicine  
cdarian@stanford.edu  
Structural organization and function of peripheral and central neural pathways that underlie directed manual behavior in the nonhuman primate. Capacity of these neural pathways to compensate/adapt following specific sensory manipulations.

Luis de Lecea, PhD  
Associate Professor, Psychiatry and Behavioral Sciences  
llecea@stanford.edu  
We focus on the molecules and neuronal circuits controlling sleep and arousal and on the role of the hypocretins/orexins in addiction.

Karl Deisseroth, MD, PhD  
Assistant Professor, Psychiatry and Behavioral Sciences  
deissero@stanford.edu  
Neural stem cells, neuroengineering, adaptive plasticity, electrophysiology, two-photon imaging, animal behavior, computational modeling, neuropsychiatry, developing noninvasive technologies for focal brain stimulation.

Ricardo Dolmetsch, PhD  
Assistant Professor, Neurobiology  
ricardo.dolmetsch@stanford.edu  
Calcium channel regulation of neuronal motility, survival and differentiation; development of new technologies to study neural circuits.

Russell Fernald, PhD  
Professor, Biological Sciences  
rfernald@stanford.edu  
Reproduction is the most powerful selective force and we focus on how important information about sex changes the nervous system. We study brain cells containing
gonadotropin releasing hormone that respond to changes in the social status by changing size and connectivity using a variety of techniques to answer questions about how social information is transduced into cellular and molecular change.

**Robert Fisher, PhD**  
*Professor, Neurology and Neurological Sciences*  
rfisher@stanford.edu  
Clinical manifestations of epileptic seizures.  
New technology for investigating and treating epilepsy.

**Craig Garner, PhD**  
*Professor, Psychiatry and Behavioral Sciences*  
garner@stanford.edu  
Cellular and molecular mechanisms of CNS synaptogenesis.

**Rona Giffard, PhD**  
*Professor, Anesthesia*  
rgiffard@stanford.edu  
Cellular and molecular basis for neuronal and astrocyte vulnerability to ischemia; roles of chaperones, inflammation and mitochondria in cell death, modeling death pathways.

**William Gilly, PhD**  
*Professor, Biological Sciences*  
lignje@stanford.edu  
Mechanisms involved in the cellular regulation of properties, density, and spatial distribution of voltage-gated Na and K channels and of ionotropic glutamate receptors cloned from the squid nervous system and expressed in frog oocytes and insect cells.

**Gary Glover, PhD**  
*Professor, Radiology*  
gary.glover@stanford.edu  
Development of novel methods for imaging of brain function using MRI

**Miriam Goodman, PhD**  
*Assistant Professor, Molecular and Cellular Physiology*  
mbgoodman@stanford.edu  
Cellular and molecular basis of sensory mechano- and thermotransduction. We study sensation at the molecular, cellular and organismal levels, leveraging the complete wiring diagram of the C. elegans nervous system, advanced tools in classical and molecular genetics, electron microscopy, and in vivo electrophysiology.

**Ian Gotlib, PhD**  
*Professor, Psychology*  
ian.gotlib@stanford.edu  
Neural foundations of information-processing biases in affective disorders; psychophysiology of depression; depression in children and adolescents.

**Isabella Graef, PhD**  
*Assistant Professor, Pathology*  
ingraef@stanford.edu  
Signaling and transcription in neural development.

**Michael Greicius, MD, MPH**  
*Assistant Professor (Acting), Neurosurgery*  
greicius@stanford.edu  
Dr. Greicius' research involves the use of functional MRI in conjunction with other imaging modalities to detect and characterize neural networks in healthy adults and patients with neuropsychiatric disorders. The main research objective is to develop novel imaging biomarkers that will lead to advances in the understanding, diagnosis, and treatment of disorders such as Alzheimer's disease, major depression, and schizophrenia.

**Kalanit Grill-Spector, PhD**  
*Assistant Professor, Psychology*  
kalanit@psych.stanford.edu  
High-level vision, object & face recognition, learning categories and concepts. Studying the neural basis of visual perception using functional imaging (fMRI) of the human brain. Computational modeling and
behavioral investigations of visual perception.

**James Gross, PhD**  
*Associate Professor, Psychology*  
james@psych.stanford.edu  
Neural and autonomic bases of emotion and emotion regulation: basic processes (emphasizing relations among behavior, physiology, and subjective experience); personality correlates; health implications, with particular emphasis on social anxiety disorder.

**Craig Heller, PhD**  
*Professor, Biological Sciences*  
hcheller@stanford.edu  
Neurobiology of sleep, circadian rhythms, regulation of body temperature, mammalian hibernation, and human exercise physiology.  
Dr. Heller is co-director of the Center for Sleep and Circadian Neurobiology. The Center fosters multidisciplinary approaches and collaborations that will help us understand the neural mechanisms controlling arousal states and arousal state transitions, the function of sleep, and the neural mechanisms of circadian rhythms. Research on human exercise physiology focuses on the effects of body temperature on physical conditioning and performance.

**Stefan Heller, PhD**  
*Associate Professor, Otolaryngology*  
hellers@stanford.edu  
Inner ear development, cellular function, and regeneration.

**Shaul Hestrin, PhD**  
*Associate Professor, Comparative Medicine*  
shaul.hestrin@stanford.edu  
Cortical function reflects the interaction of external sensory inputs with internal dynamic states of the cortex. The long-term goal of my lab is to understand how local circuits within the cortex generate these internal states and respond to sensory stimulation. We study the physiological properties of known classes of cortical neurons both in cortical slices and in vivo. We monitor how physiological responses and the morphological structure of neurons are modified by visual experience.

**Ting-Ting Huang, PhD**  
*Assistant Professor, Neurology and Neurological Sciences*  
thuang@stanford.edu  
The role of stress response and mitochondria in neurodegeneration; identify genetic modifiers that modulate responses to oxidative stress in the mitochondria.

**John Huguenard, PhD**  
*Professor, Neurology and Neurological Sciences*  
John.Huguenard@stanford.edu  

**Terence Ketter, PhD**  
*Professor, Psychiatry and Behavioral Sciences*  
tketter@stanford.edu  
Brain imaging and pharmacological studies of emotion, mood, and temperament in healthy volunteers; mood disorders.

**David Kingsley, PhD**  
*Professor, Developmental Biology*  
kingsley@cmgm.stanford.edu

**Eric Knudsen, PhD**  
*Professor, Neurobiology*  
eknudsen@stanford.edu  
Cellular mechanisms of learning, studied in the central auditory system in developing and adult animals, using behavioral, systems, cellular and molecular techniques.

**Brian Knutson, PhD**  
*Assistant Professor, Psychology*
Role of biogenic amines in modulating emotional experience. Neural correlates of anticipation of reward and punishment in healthy humans and patients with disorders of affect and addiction.

Brian Kobilka, PhD  
Professor, Molecular and Cellular Physiology  
kobilka@stanford.edu  
Structure, function and physiology of adrenergic receptors.

Ron Kopito, PhD  
Professor, Biological Sciences  
kopito@stanford.edu  
Cellular mechanisms which monitor protein biogenesis and ensure that only properly folded and assembled proteins are deployed within the cell. Genetic biochemical and cell biological approaches are used to identify the machinery involved in recognizing and destroying misfolded proteins. Molecular mechanisms of neurodegenerative diseases, particular emphasis on Huntington's disease, ALS and prion encephalopathies.

Richard Lewis, PhD  
Professor, Molecular and Cellular Physiology  
rslewis@stanford.edu  
Calcium signaling by ion channels and cellular organelles; store-operated channels; calcium control of gene expression.

Frank Longo, PhD  
Professor, Neurology and Neurological Sciences  
longo@stanford.edu  
Our studies are focused on elucidation of disease-related signaling mechanisms and development of novel small-molecule strategies for preventing neurodegeneration and promoting neurogenesis and neural function. Disease areas include Alzheimer's and Huntington's.

Bingwei Lu, PhD  
Assistant Professor, Pathology  
bingwei@stanford.edu  
Neural stem cell behavior; mechanisms of neurodegeneration.

Liqun Luo, PhD  
Professor, Biological Sciences  
lluo@stanford.edu  
We use molecular genetics to understand the logic of neural circuit organization and assembly in fruit flies and mice.

Bruce MacIver, PhD  
Associate Professor, Anesthesia-Neurophysiology  
maciver@stanford.edu  
The action of CNS depressants in hippocampal and neocortical brain slices; whole cell patch clamp and field EEG recordings are used to compare and contrast anesthetic actions on synaptic currents and local cortical circuit function.

Sean Mackey, PhD  
Assistant Professor, Anesthesia  
smackey@pain.stanford.edu  
Functional neuroimaging of pain focusing on behavior and plasticity.

Daniel Madison, PhD  
Associate Professor, Molecular and Cellular Physiology  
madison@stanford.edu  
Our laboratory uses electrophysiological techniques to study the mechanisms of synaptic transmission and plasticity in the mammalian hippocampus. One of the main focuses in the lab is in the study of synaptic long-term potentiation (LTP).

Merritt Maduke, PhD  
Assistant Professor, Molecular and Cellular Physiology  
maduke@stanford.edu  
Molecular mechanisms of chloride movement through channels and transporters. Integration
of biophysical and electrophysiological methods.

Robert Malenka, PhD  
Professor, Psychiatry and Behavioral Sciences  
malenka@stanford.edu  
Long-lasting changes in synaptic strength are important for the modification of neural circuits by experience. A major goal of my laboratory is to elucidate the molecular events that trigger various forms of synaptic plasticity and the modifications in synaptic proteins that are responsible for the changes in synaptic efficacy.

James McClelland, PhD  
Professor, Psychology  
jlm@psych.stanford.edu  
Models of memory, language, and cognitive development

Susan McConnell, PhD  
Professor, Biological Sciences  
suemcc@stanford.edu  
We are interested in how individual neurons know where they should sit in the brain and with which neurons they should form specific axonal connections. We are trying to identify and characterize the progenitor cells that give rise to neuron and the processes by which young neurons locate their correct targets among hundreds of thousands of other neurons in the brain.

Jack McMahan, PhD  
Professor, Neurobiology  
grantser@stanford.edu  
Cellular and molecular basis of synapse development and regeneration.

Vinod Menon, PhD  
Associate Professor, Psychiatry and Behavioral Sciences  
menon@stanford.edu  
Theoretical and experimental systems neuroscience - dynamical basis of brain function and dysfunction; functional brain imaging of human cognition and its disruption by mental illness; timing of perceptual and cognitive processes; mathematical models of nonlinear information processing in neural systems.

Tobias Meyer, PhD  
Professor, Chemical and Systems Biology  
tobias.meyer@stanford.edu  
Signal transduction processes that underlie synaptic plasticity. Use of fluorescent microscopy techniques to dissect the complex signaling mechanisms in dendrites that regulate channel insertion and synaptic connectivity.

Emmanuel Mignot, PhD  
Professor, Psychiatry and Behavioral Sciences  
mignot@stanford.edu  
Our laboratory studies sleep disorders at the molecular and neurophysiological level. Most of our work focuses on the sleep disorder narcolepsy and the neuropeptide system hypocretin/orexin.

William Mobley, PhD  
Professor, Neurology and Neurological Sciences  
ngfv1@stanford.edu  
Signaling and actions of neurotrophic factors.

Daria Mochly-Rosen, PhD  
Professor, Chemical and Systems Biology  
mochly@stanford.edu  
Mechanisms underlying the specificity of protein kinase C isozymes; role of protein-protein interaction in signal transduction.

Tirin Moore, PhD  
Assistant Professor, Neurobiology  
tirin@stanford.edu  
Mechanisms of visual perception and cognition; visuomotor integration; control of movement.

William Newsome, PhD  
Professor, Neurobiology
Bill@monkeybiz.stanford.edu
Neural processes that mediate visual perception and visually guided behavior.

Theo Palmer, PhD
Assistant Professor, Neurosurgery
tpalmer@stanford.edu
Neural precursor cells and the production of new neurons. Local cues that regulate precursor activity. How this information is used to recruit cells for CNS repair or to interrupt precursor signaling once it has gone awry in malignant growth.

Karen Parker, PhD
Assistant Professor, Psychiatry and Behavioral Sciences
kiparker@stanford.edu
Oxytocin and social behavior; stress and HPA axis physiology.

Anna Penn, PhD
Assistant Professor, Pediatrics-Neonatology
apenn@stanford.edu
We focus on the role of placental factors in brain development, including the influence of steroids (estrogens and progestins) and protein hormones on cerebellar and hippocampal neurogenesis and connectivity.

David Prince, MD
Professor, Neurology and Neurological Sciences
dapprince@stanford.edu
Altered properties of neurons/synapses in models of epilepsy.

Jennifer Raymond, PhD
Assistant Professor, Neurobiology
jenr@stanford.edu
The goal of my research is to determine the role of specific classes of neurons and synapses in shaping the computations performed by the cerebellum. To this end, we are using the latest molecular-genetic approaches for manipulating neural circuits in combination with the detailed behavioral and circuit-level analyses possible in the oculomotor system.

Lawrence Recht, MD
Associate Professor, Neurology and Neurological Sciences
lrecht@stanford.edu
Our laboratory focuses on two interrelated projects: (1) assessment of glioma development within the framework of the multistage model of carcinogenesis through utilization of the rodent model of ENU neurocarcinogenesis; and (2) assessment of stem cell specification and pluripotency using an embryonic stem cell model system in which neural differentiation is induced.

Richard Reimer, PhD
Assistant Professor, Neurology and Neurological Sciences
rjreimer@stanford.edu
Molecular biology and physiology of neurotransmitter release; neuropathophysiology of lysosomal storage disorders; biosensors.

Allan Reiss, PhD
Professor, Psychiatry and Behavioral Sciences
reiss@stanford.edu
Gene-brain-behavior interactions as elucidated from the study of neurodevelopmental and neuropsychiatric conditions including fragile X syndrome, Williams syndrome, Turner syndrome,
velocardiofacial syndrome, autism, preterm birth and other disorders of cognition and behavior. The lab employs comprehensive multi-modal neuroimaging techniques with identification and measurement of genetic risk factors and neurobehavioral outcome. An interdisciplinary model is emphasized.

Anthony Ricci,
Assoc. Prof, Otolaryngology/Head & Neck Surgery
aricci@stanford.edu
Auditory hair cell mechanotransduction and synaptic transmission.

Terence Sanger, PhD
Assistant Professor, Neurology and Neurological Sciences
sanger@stanford.edu
Movement disorders in children, computational neural networks, basal ganglia function and diseases.

Robert Sapolsky, PhD
Professor, Biological Sciences
sapolsky@stanford.edu
How a neuron dies during aging or following various neurological insults; how such neuron death can be accelerated by stress; the design of gene therapy strategies to protect endangered neurons from neurological disease.

Mark Schnitzer, PhD
Assistant Professor, Biological Sciences
mschnitz@stanford.edu
In vivo fluorescence optical imaging and electrophysiological studies of the mammalian brain towards understanding biophysical aspects of learning and memory. We are developing and applying novel imaging approaches such as multiphoton fluorescence endoscopy for examining individual neurons and dendrites, with emphasis on experiments in awake behaving animals.

Matthew Scott, PhD
Professor, Developmental Biology
scott@cmgm.stanford.edu
Genetic regulation of animal development and human disease. We study homeobox genes, hedgehog/patched signaling and its links to skin and brain cancer, development of the neural tube and cerebellum signaling, and heart development.

Carla Shatz, PhD
Professor, Biological Sciences
cshatz@stanford.edu
Effect of activity during the critical period on brain development.

Kang Shen, PhD
Assistant Professor, Biological Sciences
kangshen@stanford.edu
We are interested in understanding how synapses are formed, the final step in wiring a nervous system. In particular, the molecular mechanisms underlying synaptic specify: how neurons recognize each other and how they make decisions about forming synapses between contacting neurites during development. We use molecular, genetic and cell biological tools to study this question in the nematode, C. elegans, which has a very simple nervous system containing only 302 neurons and approximately 6000 synapses. We are also interested in understanding how synapses are eliminated. During development, synapse formation is always accompanied by synapse elimination. It is the balance between these two events that eventually lead to the maturation of synaptic circuit. Very little is known about synapse elimination. We are using genetic approaches to study this. Another area of interest is how axons and dendrite polarity is established and maintain.

Krishna Shenoy, PhD
Assistant Professor, Electrical Engineering
shenoy@stanford.edu
Neural prosthetic systems, neural basis of movement preparation and generation,
population codes and sensorimotor integration.

**Stephen Smith, PhD**  
Professor, Molecular and Cellular Physiology  
sjsmith@stanford.edu  
Imaging of synapse development and structural dynamics; cell signaling in neural development and plasticity.

**Raymond Sobel, PhD**  
Professor, Pathology  
ray.sobel@stanford.edu  
Cellular and molecular mechanisms of immune responses in the central nervous system; multiple sclerosis.

**Gary Steinberg, MD, PhD**  
Professor, Neurosurgery  
steinberg@stanford.edu  
Molecular and cellular mechanisms underlying cerebral ischemia; development of neuroprotective and neurorepair strategies; stem cell transplantation for stroke.

**Lawrence Steinman, PhD**  
Professor, Neurology and Neurological Sciences  
steiny@stanford.edu  

**Stuart Thompson, PhD**  
Professor, Biological Sciences  
stuartt@stanford.edu  
Signal transduction mechanisms in neurons with the goal of better understanding how neurons process information. Signal cascades initiated by G-protein coupled receptors and regional specialization of function in neurons and the role that localized clusters of ion channels play in the processing of information by the cell.

**Richard Tsien, PhD**  
Professor, Molecular and Cellular Physiology  
rwtsien@stanford.edu  
Molecular properties of ion channels in relation to function of nerve and muscle; calcium signaling and synaptic plasticity.

**Anthony Wagner, PhD**  
Associate Professor, Psychology  
awagner@stanford.edu  
Cognitive neuroscience of memory and cognitive control; prefrontal cortex and medial temporal lobe function; interactions between memory systems; neurocognitive aging.

**Brian Wandell, PhD**  
Professor, Psychology  
wandell@stanford.edu  
Development and plasticity of signals in the human visual pathways; current emphases on reading development and cortical plasticity following retinal disease. Magnetic resonance, behavior, and computational methods.

**Jeffrey Wine, PhD**  
Professor, Psychology  
wine@psych.stanford.edu  
Regulation of ion channels by intracellular messengers and excitation-secretion coupling.

**Tony Wyss-Coray, PhD**  
Associate Professor, Neurology and Neurological Sciences  
twc@stanford.edu  
Molecular mechanisms of neurodegeneration and Alzheimer’s disease.

**Yanmin Yang, PhD**  
Assistant Professor, Neurology and Neurological Sciences  
yyanmin@stanford.edu  
Elucidate biological functions of cytoskeletal
organizing proteins in neurons. Define the cellular and molecular mechanisms underlying the neurodegeneration in BPAG1 null mice.

David Yeomans, PhD
Associate Professor, Anesthesia
dcyeomans@stanford.edu
Pain physiology and molecular biology; herpes vector-directed genetic alteration of sensory neurons; gene therapy for pain; cell transplantation as pain therapy.

Jamie Zeitzer, PhD
Assistant Professor, Psychiatry
jzeitzer@stanford.edu
My research concerns examination of human and primate circadian rhythms and sleep; notably, the neural mechanisms that underlie wakefulness and circadian photoreception. I am also involved in collaborative efforts in examining the role of sleep disruption in medical pathologies such as Alzheimer's disease, spinal cord injury, and breast cancer.
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<tr>
<th>Name</th>
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<tr>
<td>Nancy Adleman</td>
<td>Allan Reiss</td>
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<td>Monique Barakat</td>
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<td>Odmara Barreto-Chang</td>
<td>Ricardo Dolmetsch</td>
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<td>Justin Brown</td>
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Bryan Gore  Marc Tessier-Levigne
Viviana Gradinaru  Karl Deisseroth

Name  Lab
Logan Grosenick  *rotating
Lisa Gunaydin  *rotating
Christine Guo  Jennifer Raymond
Eric Hoopfer  Liqun Luo
Andrew Hsu  *rotating
Jennifer Hwa  Tom Clandinin
Kira Irving  *rotating
Thomas Jerde  Brian Knutson
Rachel Kalmar  Krishna Shenoy/Bill Newsome
Mridu Kapur  Yanmin Yang
David Kastner  Stephen Baccus
Alexander Katsov  Tom Clandinin
Matthew Kaufman  Krishna Shenoy
Michael Ke  Jennifer Raymond
Alex Keuroghlian  Eric Knudsen
Daniel Kimmel  Bill Newsome
Matthew Klassen  Kang Shen
Jon-Michael Knapp  Bruce Baker
Juliet Knowles  Frank Longo
Jocelyn Krey  Ricardo Dolmetsch
Star Lee  Theo Palmer
Jonathon Leong  *rotating

Name  Lab

Kristin Maczko  Eric Knudsen
Milica Margeta  Kang Shen
Sonia Mayoral  Anna Penn
Christine McLeavey  Currently in Masters in Medicine program
Geoffrey Meissner  Bruce Baker
Leslie Meltzer  Karl Deisseroth
Jordan Nechvatal  *rotating
Christopher Olin  Russ Fernald
Georgia Panagiotakos  *rotating
Maulik Patel  Kang Shen
Alex Pollen  David Kingsley
Vivian Poon  Kang Shen
Saurabh Prakash  Tom Clandinin
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<td>Kim Zaia</td>
<td>Richard Reimer</td>
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REGISTRATION

REGISTRATION COMMITMENT FORM

The Registration Commitment is the official University registration document and is mailed to the known addresses of all students. By following instructions enclosed with the Registration Commitment, new students may complete the entire commitment process by mail. Each student is responsible for ensuring that the University has his or her correct address. You will also receive a PIN number. With your PIN, registration for classes is done through an on-line web application called Axess.

Through Axess, you can file your registration commitments, sign up for courses, review your grades, request an official transcript, review your status regarding degree requirements, give the university your correct address, file and amend your study list, apply for housing, etc. Students can reach Axess from the Stanford Home page or through

https://axess.stanford.edu/

By far the best source of accurate information about the ins-and-outs of Axess is other neurosciences graduate students!

Complete instructions on registration procedures and payment of fees will be mailed to each student, together with a Commitment to Register. Graduate students are required by the University to register for Autumn, Winter, Spring and Summer quarters each year until the degree is received. Registration is also required each quarter in which Stanford financial award is received. Leaves of absence require approval before departure.

The number of units for which you as a student are eligible to register depends upon the amount of funding for tuition you will receive. When you arrive at Stanford, and before you register for classes, you will need to see the Program Administrator to verify the source, amount and duration of your funding. After this has been done, you will be able to register accordingly.

The Time Schedule includes the University calendar, final exam schedules, information on registration procedures, payment of fees, and course listings. It is published prior to each quarter and is available at the University Registrar’s Office, at 630 Serra Street.
Your **Study List** is the list of courses you are taking in a given quarter. You are required to submit your student list officially each quarter via the Axess Courses/Grades function.

**Study Lists are due by 11:59 pm on the Sunday after the second week of instruction; late fees are charged for submission thereafter.** Refer to the back cover of the Time Schedule for specific instruction on how to file your study list. Revisions to your study list must be made within the relevant deadlines. Changes after these deadlines are not permitted. See the Time Schedule for deadlines dates.

Students will receive a University Bill. Tuition credits are entered on this bill. Also entered are other University charges such as rent (if applicable), student fees, late fees, loans, Stanford health insurance, etc. Students receiving a fellowship through Stanford may elect to have these charges deducted from their stipend checks and automatically applied to their bill.

**If your bill is incorrect, it is your responsibility to ensure that the bill is corrected and to pay the correct amount by the payment deadline. The deadline for payment of all fees not covered by a Stanford award is the day before the first day of classes.**

Bills may be paid at any time prior to this date by mail or in person. Student Financial Services (723.2181) can answer any questions you have relating to your bill. Their office is located at 632 Serra Street, Suite 150.

**Doctoral students are eligible for TGR status when they have been admitted to candidacy, completed all required coursework, and submitted the Doctoral Dissertation Reading Committee form.** Students must complete the residency requirement of 135 units of academic credit before moving to TGR status. Students registered in TGR status must enroll each quarter in the TGR course (802 TGR Dissertation) in the department where they are conducting their research, with their advisor as the instructor.

**If TGR students take courses other than 802 TGR Dissertation, they may need to pay additional tuition.**

Work on the thesis, dissertation, or other remaining requirements (i.e., TGR Dissertation) must be evaluated each quarter for academic progress and graded as follows: “N” indicating satisfactory progress, “N-” for unsatisfactory progress, “S” for satisfactory completion of final quarter. A hold is placed on the registration of a student who receives an “N-” grade for two consecutive quarters. Further registration is
contingent on approval of an agreement for completing degree requirements by the advisor and the Program.
ADVISING AND TRACKING OF STUDENT PROGRESS

It is the responsibility of the student to advance toward the PhD degree in a timely fashion. To help the student achieve this goal, advice and counseling will be provided to the student as follows:

During the **First Year**, each student will be assigned a faculty adviser who will meet with the student at the end of each quarter to discuss course selection and laboratory rotations.

During the **Second Year**, the student will arrange to meet formally with their Thesis Advisor at the end of each quarter to review course selection and research progress. A brief report of each meeting (date and comments) will be sent to the Program Administrator.

**Before the end of the Second Year** students must convene a meeting of their thesis committee, even if they are not yet prepared to qualify (see section below on **Thesis Advisory Committee**).

**Beyond the Second Year**, advice and guidance will be provided by the Thesis Committee, which will meet annually, as arranged by the student. Brief reports (date, attendees and comments) from these meetings will be submitted to the Program Administrator by the Thesis Advisor.

Student progress toward the PhD degree will be tracked by the Program Administrator. His/her record of progress will be checked in the Fall of each year in a meeting with the student; this meeting will be scheduled by the Program Administrator.

**The Program Committee will review the record of each student’s progress annually in June.**
PROGRAM OF STUDY

NEUROSCIENCES PROGRAM REQUIREMENTS

Two overlapping sets of requirements must be met in order to earn a PhD in Neurosciences at Stanford University. Those set by the Neurosciences Program Committee deal with the types of courses students take, the preliminary exam, and procedures for progressing towards the degree. Requirements set by the University deal primarily with advancement towards candidacy and the final University Oral Exam. The requirements of the Neurosciences Program Committee are considered first.

Formal coursework is designed to provide students with a solid foundation in several areas of neuroscience that can be built upon with more advanced courses. The formal course requirements are minimized to enable students to devote a considerable amount of time to their research, even during the first two years.

All of these courses must be taken for a letter grade (not pass/fail). Students must receive a B or better for the course to count towards their PhD degree. Students concurrently in the MD program do not receive grades for medical school courses.

A student may place-out of any of these courses by demonstrating to the instructor a command of the material presented in the course.

Each student must complete three basic requirements.

1. Neurobiology 206
2. Neurobiology 300 (Journal Club)
3. Five advanced courses. Four of these courses must be selected from four of the five core neuroscience areas listed below. One course is an elective, to be selected by the student, which provides additional scientific breadth in an area related to the student’s research interests. If the elective course is one of the core courses listed below, no prior approval is necessary. Courses from outside the neuroscience core can satisfy the elective requirement with the approval of the Program Director and the student’s Advisor.

In addition, in consultation with their Thesis Advisor and Thesis Committee, students may take the opportunity to select, from the hundreds of courses available at Stanford,
additional courses that meet their specialized needs, which they can audit or take for credit.
A. The Nervous System (NBIO 206)
This course provides an introduction to the structure and function of the nervous system, including neuroanatomy, neurophysiology and neurochemistry. Topics range from the properties of neurons to the mechanisms and organization underlying higher functions. This lecture and laboratory course is designed to present a coherent framework as a preparation for more advanced work in neurobiology. Advanced students may participate as teaching assistants in this course. 7-8 units, offered Winter Quarter 2008 (Clandinin)

Students who wish to have the NBIO 206 requirement waived because they have taken an equivalent course elsewhere should indicate so in writing to the Course Director within the first four weeks of the Autumn Quarter. The course director will act on the student’s request. The student may need to demonstrate competence in the subject material by performing adequately on a written examination administered by the director, if there is uncertainty about the applicability of the student’s previous course work. Arrangements to take this exam are made on an individual basis, with the director of the course. This examination should be taken prior to the start of the Winter Quarter.

B. Professional Development and Integrity in Neuroscience (NBIO 300)
Required of Neurosciences PhD students every quarter through the third year of graduate work. Develops professional skills in critical assessment and oral presentation of findings from current neuroscience literature, in visual presentation of quantitative data and writing research grants. Additional topics include the role of animals in lab research, fraud in science, responsibility of authors and reviewers, science in a multicultural environment, and the relationship between student and mentor. Student and faculty presentations and discussions. A faculty mentor assists students in preparing for the literature presentations. 1-2 units, offered Autumn Quarter 2007, and Winter and Spring Quarters 2008 (Dolmetsch)

C. Core Courses
Students are required to become familiar with current research in a broad range of neuroscience areas by taking five advanced courses, four of which must be selected from four of the following core areas (as described above):

1. Systems and Behavioral Neurosciences
2. Molecular and Cellular Neurosciences
3. Developmental Neuroscience
4. Clinical Neuroscience
5. Computational Neuroscience
Each of the courses in these categories is typically offered on alternate years so that the core course requirements can be completed within two years. These options may change, depending on which courses are offered during the next two years.

1. **SYSTEMS AND BEHAVIORAL NEUROSCIENCES**

**Neural Basis of Behavior (NBIO 218)** Advanced seminar on principles of information processing in the CNS of vertebrates, and the relationship of functional properties of neural systems with perception and behavior. Study of original papers, directed group discussion and student presentations. 4 units, offered Spring Quarter 2008 (Knudsen & Raymond)

**Central Mechanisms in Visual Perception (NBIO 220)** This course reviews the neural basis of visual perception and simple forms of visually based cognition such as attention, short-term memory, decision-making and motor planning. Emphasis is placed on topics of current interest in the visual neuroscience literature. 2-4 units, offered Spring Quarter 2009 (Newsome & Moore)

**Affective Neuroscience (PSYCH 251)**
Focus is on theory and research in the field of affective neuroscience. Comparative and human research approaches map affective function to both neuroanatomical and neurochemical substrates. 3 units, offered Winter Quarter 2008 (?) (Knutson)

**High Level Vision (PSYCH 250/NBIO 240)**
Critical review of theories and ongoing research of high level vision. Topics: behavioral studies pertaining to representation of objects; generalization and invariances; learning new categories; neuropsychological deficits; properties of high level visual areas in monkeys and humans; theories and models of object and face recognition. 2 units, offered Spring Quarter 2008 (Grill-Spector)

**Comparative Neuroanatomy (COMPMED 207)**
The structure and function of vertebrate brains. Focus is on laboratory animals commonly used in neuroscience research, and comparisons made with the human brain. Advantages and limitations of species chosen for neurobiological and biomedical research. Introduction to neuroanatomical methods and possible mechanisms of brain evolution. 2-4 units, offered Autumn Quarter 2008 (Buckmaster & Darian-Smith)
Information and Signaling Mechanisms in Neurons and Circuits (MCP/NBIO 258) How do synapses, cells and neural circuits process information relevant to a behaving organism? This course will examine how phenomena of information processing emerge at several levels of complexity in the nervous system, including sensory transduction in molecular cascades, information transmission through axons and synapses, plasticity and feedback in recurrent circuits, and encoding of sensory stimuli in neural circuits. 5 units, offered Autumn Quarter 2007. (Baccus & Tsien) Note that this course may also satisfy the Cellular & Molecular requirement, but not both.

Neural Systems and Behavior (BIOSCI 163/263) (graduate students register for 263) Neuroethologists take a comparative and evolutionary approach to study the nervous system. How do brains of animals compare and how did they evolve? How are neural circuits adapted to species-typical behavior? What is the sensory world of a real animal and how does it vary from species to species? Neuroethologists use behavioral, electrophysiological, neuroanatomical and genetic tools to discover the neural basis of species specific behavior. The course is research oriented with analysis of original research publications. 4 units, offered Autumn Quarter 2007 (Fernald)

2. MOLECULAR AND CELLULAR NEUROSCIENCES

Information and Signaling Mechanisms in Neurons and Circuits (MCP/NBIO 258) How do synapses, cells and neural circuits process information relevant to a behaving organism? This course will examine how phenomena of information processing emerge at several levels of complexity in the nervous system, including sensory transduction in molecular cascades, information transmission through axons and synapses, plasticity and feedback in recurrent circuits, and encoding of sensory stimuli in neural circuits. 5 units, offered Autumn Quarter 2007 (Baccus & Tsien) Note that this course may also satisfy the Systems requirement, but not both.

Molecular Physiology of Membranes (MCP 255) Examines the basic biophysical principles that govern membrane physiology and applies these principles to aid understanding a wide range of physiological processes. 4 units, (?) (Maduke)

How Cells Work: Energetics, Compartments, and Coupling in Cell Biology (MCP 256) Examines the basic biophysical principles that govern cell physiology and
applies these principles to aid understanding a wide range of physiological processes. 4 units, offered every Spring – next offered Spring Quarter 2008 (Goodman & Maduke)

**Synaptic Transmission (MCP 215)** Anatomical, physiological and biochemical basis of synaptic function in the peripheral and central nervous system. Lectures by the faculty and intensive discussions of relevant research papers. 5 units, offered every other Autumn – next offered Autumn Quarter 2008 (Madison & Smith & Hestrin)

**Molecular and Cellular Neurobiology (BIO 254)**
Cellular and molecular mechanisms in the organization and function of the nervous system. Topics: cell biology of the neuron, wiring of the neuronal network, synapse structure and synaptic transmission, signal transduction in the nervous system, the molecular basis of behavior including learning and memory, molecular pathogenesis of neurological diseases. 4-5 units, offered Autumn Quarter 2008 (Luo, Shen, Clandinin)

**Genetic Analysis of Behavior (MCP 216)**
Advanced seminar on the findings and implications of behavioral genetics as applied to both invertebrate and vertebrate model systems. Topics will include, for example, studies of circadian rhythms, sensory systems and central pattern generators, and the course will provide both an introduction to the relevant genetic techniques as well as a historical perspective. Study of original papers, directed discussion, and student presentations. Some familiarity with introductory genetics and standard techniques in molecular biology will be useful. 4 units, offered every other Spring – next offered Spring 2008 (Clandinin & Goodman)

**Neuronal Biophysics (BIOSCI 217)**
The goal of the course is to teach students the biophysical basis for neuronal dynamics and to allow students to use physical principles as tools for prediction of neuronal behavior. A few fundamental physical principles will be seen to give rise to a rich set of dynamical activities. Quantitative and computational techniques will be used to describe these physical principles and resulting models of neuronal dynamics. 3 units, offered every Spring - next offered Spring Quarter 2009 (?) (Schnitzer)

3. DEVELOPMENTAL NEUROSCIENCE
**Developmental Neuroscience (BIOSCI 258)** This seminar course will consider recent findings about the mechanisms of neurogenesis, migration, axon outgrowth, synapse formation, and synaptic plasticity during the development of the nervous system. 4 units, offered every other Spring – next offered Spring Quarter 2009 (McConnell, Garner & Shen)

4. **CLINICAL NEUROSCIENCE**

**Neurobiology of Disease (NENS 205)** A series of case demonstrations of selected neurological disorders; discussion of the pathophysiological basis of the disorder; presentation of the basic principles underlying modern diagnostic and therapeutic management; and a discussion of recent advances for each disease entity. 2 units, offered every other Winter, next offered Winter Quarter 2009 (Reimer, Mobley & Yang)
Molecular Mechanisms of Neurodegenerative Disease (BIOSCI/NENS 267) The aging of the human population has spawned an epidemic of neurodegenerative disorders such as Alzheimer and Parkinson disease that continues to raise ever more pressing medical and social issues. The past 10 years have witnessed a revolution in our understanding molecular mechanisms of disease pathogenesis. This course will comprise an in-depth analysis, through lectures and reading based on current research literature, of the genetic, molecular and cellular mechanisms that underlie neurodegenerative diseases. The course will also include an overview of the clinical aspects of the disease through case presentations. 4 units, offered Winter 2008 (Kopito, Reimer, Wyss-Coray, So, Bronte-Stewart and Greicus)

5. COMPUTATIONAL NEUROSCIENCE

Large-Scale Neural Models (BIOE 332A&B) Emphasis is on cortical computation, from feature maps in the neocortex to episodic memory in the hippocampus, with attention to the roles of recurrent connectivity, rhythmic activity, spike synchrony, synaptic plasticity, and noise and heterogeneity. Techniques to predict and quantify network behavior; applications to data recorded from models programmed and run in labs in real-time on neuromorphic hardware developed for this purpose (Boahen). (both sections must be taken for core computational neuroscience credit)

The Neural Basis of Cognition: A parallel distributed processing approach (Psych 209 and 209a) The neural basis of perception and attention; memory, learning, and semantic knowledge; language and reading; and action selection, planning, and problem solving. Findings from human behavioral experiments, neurophysiology, functional brain imaging, and the effects of brain disorders on performance and computational models that address these findings from the parallel distributed processing point of view will be covered (McClelland) (both sections, lecture and lab must be taken for core computational neuroscience credit)

Computational Neuroscience (NENS 220) Introduction to computational neuroscience: models of vision, audition, and learning; self-organizing networks. 3 units, offered Winter Quarter 2008 (Huguenard & Sanger)

For students with primary research interests in human neuroimaging, both of the following courses to satisfy the computational course requirement.
Computational Neuroimaging (PSYCH 204A) A seminar reviewing recent models of various neuroimaging signals including fMRI and event-related electrical potentials. 3 units, offered Autumn Quarter 2008 (Wandell)

Computational Neuroimaging: Analysis Methods (PSYCH 204B) A lab course to develop skills in software and mathematical/statistical analysis of neuroimaging signals. 3 units, offered every other Autumn – next offered Autumn Quarter 2009 (Grill-Spector & Wandell)

Finally . . . the following courses, offered by different neuroscience faculty (and students), may be of interest to many neuroscience graduate students.

Strongly recommended for first year neurosciences graduate students:

Understanding Techniques in Neurosciences (NBIO 277SI) 2 units, offered Autumn Quarter 2008 (Matt Carter & Saul Villeda & Jennifer Shieh)

Strongly recommended for students with sketchy quantitative backgrounds:

Math Tools for Neuroscience (NBIO 228) 2 units; offered Spring Quarter 2008 (Ilana Witten & Scott Owen)

Other courses of interest:
Selected Topics in Affective Disorders (PSYCH 234) Not offered this year

Cognitive Neuroscience (PSYCH 202) Last offered Spring Quarter 2007 (Garielli & Grill-Spector & Wandell)

Applied Vision and Image Systems (PSYCH 221) Last offered Winter Quarter 2007 (Wandell)

Animals Advancing Biotechnology (COMPMED 108/208) Next offered Autumn Quarter 2008 (Cork)

Nerve, Muscle and Synapse (BIO 267H) Electrophysiology lab course, taught at Hopkins Marine Station. Last offered Spring Quarter (Gilly)

Foundations of Memory (PSYCH 210)
Last offered Autumn Quarter 2007 (Wagner)

**Human Behavioral Biology (BIO 250)**
Last offered Autumn 2007 (Sapolsky)

**Stem Cells and Gene Therapy (MI 231)**
? (Blau & Nolan)

**Neuroeconomics (PSYCH 278)**
Offered Autumn Quarter 2008 (Knutson & Rangel)

**Principles of Sleep Research (BIO 249)**
Last offered Spring Quarter 2007 (Heller)

**Seminar on Emotion (PSYCH 261)**
Last offered Winter Quarter 2007 (Gross)

**Seminar on Emotion Regulation (PSYCH 268)**
Last offered Spring Quarter 2007 (Gross)

**Functional MRI Methods (RAD 227)**
Last offered Autumn Quarter 2007 (Glover)

**Stem Cell Engineering (BIOE 261/NSUR 261)**
Last offered Autumn Quarter 2007 (Deisseroth & Palmer)

**LABORATORY ROTATIONS**

Laboratory rotations are strongly recommended, but are not required. Students are encouraged to rotate through several laboratories during their first year before making a commitment to a thesis laboratory. Students should have chosen a thesis laboratory by the end of the Spring quarter of the first year, after rotating in up to three laboratories. An additional rotation may be arranged with prior consent of the Program Director. Rotations are not limited to faculty participating in the Neurosciences Program. By mutual consent, students may rotate after the first quarter with any faculty member in the biomedical sciences as part of our flexible admissions program.

Research rotations are an important part of the graduate training program. Rotations enable students to make, confirm or modify career decisions based on research experience. Rotations allow students to experience the intellectual and laboratory
atmosphere of up to three lab groups and become familiar with invaluable experimental approaches and techniques. In addition, students form friendships with faculty members, as well as with students and postdocs in their laboratory, who often become lifelong scientific collaborators.

It is the student’s responsibility to contact appropriate faculty members about rotation opportunities.

At the end of each quarter, students will meet with the First Year Advisor to discuss rotations for the subsequent quarter.

Students rotating or carrying out thesis research in a School of Medicine department register for the graduate research course and faculty section number of that department.

LABORATORY SELECTION

Final selection of a laboratory for PhD thesis research will be made only after consultation with the faculty in question and with the Program Director and no earlier than the end of the Winter quarter of the first year. The selected Thesis Advisor must notify the Program Director and Program Administrator indicating his/her agreement to mentor the student towards a PhD and indicating financial support, if the student is not on a training grant and does not have an individual fellowship.

As part of the flexible admissions program, students may switch to another PhD program if their interests change in the first year. This will have to be arranged with the prospective Thesis Advisor and Department or Program.

THESIS ADVISORY COMMITTEE

After deciding on a Thesis Advisor the student and Thesis Advisor shall select a Thesis Advisory Committee. We strongly suggest that the Committee be selected by the end of winter quarter of the second year. Under no circumstances shall the Committee be selected later than the end (typically summer quarter) of the second year.

The student and Thesis Advisor will choose three individuals who they consider to be best able to judge the scientific content of the thesis; the Thesis Advisor will chair the Committee. Given the interdisciplinary nature of neuroscience research in general, and the diverse interests of our faculty, the Thesis Advisory Committee will be composed
of faculty from more than one department, and it’s composition must be approved by the Program Director.

These three individuals, together with the student’s advisor, shall constitute the Thesis Committee. The student will arrange an initial meeting of the Thesis Committee by the end of the student’s second year (see Advising and Tracking of Student Progress). The Qualifying Examination may or may not be taken at this first meeting (see Qualifying Examination). After this initial meeting, the Thesis Committee will meet at least once a year to monitor the student’s progress in research. It is the responsibility of the student to organize these annual meetings. In advance of each meeting the student shall prepare a 1-2 page summary of progress made on the thesis project. Copies of this summary should be sent to the members of the Thesis Committee.

The Thesis Committee functions to review the progress of the thesis research, to identify potential problems at an early stage, and help to channel the research in a fruitful direction (see Advising and Tracking of Student Progress). In the rare chance that the Thesis Advisor and Thesis Committee find that the student is unable to make sufficient progress towards completion of the thesis, they shall inform the Program Director in writing. Unsatisfactory progress towards completion of the PhD degree will be considered grounds for dismissal from the Program.

QUALIFYING EXAMINATION

The goal of the Qualifying Examination is to determine the student’s preparedness to pursue research on a thesis topic, explore whether potential problems have been considered, assess the student’s ability to think, and the student’s familiarity with relevant background information and alternative experimental approaches.

The Qualifying Examination should be taken by the end of the student’s second year in the Program. An extension must be granted by written permission from the Program Director. Exceptions are allowed for combined MD/PhD students. Failure to complete the Qualifying Examination by the end of the third year will be considered grounds for dismissal from the Program.

The Qualifying Examination will consist of an oral examination given by the Thesis Advisory Committee. A written version of the thesis proposal should be distributed to the committee members at least one week prior to the exam. The student is encouraged to meet each member of the Thesis Committee in advance in order that both shall be clear about the scope of the examination.
The intent of the examination is to ensure that:

1. The student has selected a good thesis topic and is qualified to undertake the study. The student is required to prepare, beforehand, an approximately 10-page thesis proposal in the format of an NRSA postdoctoral proposal.

2. The student is able to discuss topics related to the background information relevant to the proposal. A typical exam begins with a prepared presentation of the thesis proposal. Faculty will frequently interrupt with questions about the work, its interpretation, the methods, and background questions relevant to the proposal.

Following the exam, the Chair of the Thesis Committee will send a copy of the student’s proposal and a short appraisal of the student’s performance on the exam, including the decision of the committee, to the Program Administrator.

After successful completion of the Preliminary Examination, the student may apply for admission to candidacy. In the event that the student does not pass the Preliminary Examination, the Thesis Committee will meet together with the Program Director to consider whether extenuating circumstances warrant permitting the student to be examined a second time. If so, the Thesis Committee will decide upon a time and a format for the second examination. If the student is not given an opportunity to take a second examination, or if he or she is given such an opportunity and fails the second examination, he or she will be dismissed from the program (see Dismissal from the Program). The dismissal shall be made in writing.

ADMISSION TO CANDIDACY

Admission to candidacy means that the student has completed the Qualifying Examination and most of the course requirements of the Neurosciences Program and is now ready to begin thesis research leading to a dissertation and University oral exam. The Application for Candidacy for Doctoral Degree Form must be filled out and submitted to the Program Administrator. The schedule will be adjusted to fit the needs of MSTP and MD/PhD students, or students who switch from another program.

DISSERTATION AND ORAL EXAM

Please refer to University Requirements for details of process and procedure.

It is anticipated that the PhD program will be completed in five years, although it is possible to complete it in four years. However, it is recognized that exceptional
circumstances do arise and that additional time may be necessary. At such time as the student and Thesis Advisor are agreed that the student has carried out research of adequate quality and quantity, it shall be written up, following University regulations, in a dissertation.

The dissertation will be evaluated by the Reading Committee, which must be approved by the Director of the Program. In the Neurosciences Program, the Reading Committee has generally been one and the same with the Thesis Committee, although changes in membership can be made at the desire of the faculty member or student. The Reading Committee shall consist of the Thesis Advisor plus three additional members. At least two of the additional members must be on the Academic Council.

A Doctoral Dissertation Reading Committee Form must be filed in the Neurosciences Program Office before the oral examination. The student will provide each member of the Reading Committee with a typed draft of the thesis at least 2 weeks in advance. This will not be the student’s first draft, but it need not be a polished finished product — the examiners must be able to read it easily and it must have all the figures and tables of the final version. When the Reading Committee is satisfied that the thesis represents an appropriate piece of work, the student and Thesis Advisor shall arrange for presentation of the thesis in an open, announced seminar and for its defense before the Examining Committee in the University Oral Examination. The University Oral Examination Schedule Form, detailing the composition of the Examination Committee and time of exam, must be submitted to the Administrator of the Program at least three weeks prior to the proposed examination date. Include an abstract of the dissertation proposal. This should allow sufficient time to provide the Committee Chair with necessary information and to send announcements to the Stanford Report.

UNIVERSITY ORAL EXAMINATION

The University oral examination is a requirement of the PhD program. At the time of the exam the student’s candidacy must be valid and the student must be registered in the quarter in which the exam is taken. The purpose of the exam is to test the candidate’s command of the field of study and to confirm fitness for scholarly pursuits. The exam will be administered according to the following guidelines based on both University and Program requirements:

1. The Examining Committee shall consist of five members: four examiners (three of which must be on the Academic Council) and a Chair. The four members of the Thesis Advisory Committee should typically constitute the Examining Committee. One of the required examiners may be an individual who is not on the Academic
Council, if he or she contributes an area of expertise not readily available from the faculty and if approved upon petition to the Degree Progress Office.

2. **The Chair of the Examining Committee must be an Academic Council member and cannot come from the same department as either the student candidate or the principal advisor, but may be a member of the Neurosciences Program.** Departmental affiliation of the Chair and Thesis Advisor includes joint appointments; courtesy appointments do not affect eligibility. The Chair can be from the same department as members of the Examining Committee other than the Thesis Advisor. The ultimate responsibility for appointing a Chair rests with the Program Director, although the student and Thesis Advisor are in the best position to arrange this. The student should make certain that their choice of Chair meets the University criteria by double-checking with the Program Administrator or Director. The composition of the Examining Committee must be approved by the Director of the Neurosciences Program. The Program Administrator will then schedule a room for the exam.

3. The Program Administrator will provide the Chair with a University Oral Examination schedule, University Guidelines for Oral Examinations Procedures, an abstract of the dissertation, and ballots.

4. Following the public seminar, the Examining Committee will continue the examination of the candidate (in private) on the same day for a period not to exceed two hours.

5. At the end of the examination the Committee members, without the student present, shall vote on the student’s performance in a secret ballot. At least 4 votes out of a possible 5 (or 4 out of 6, or 5 out of 7, or 6 out of 8) are required for a passing grade.

6. The oral examination results are validated by the Chair and must be reported to the Program Administrator and the Degree Progress Office within five days of the examination.

7. University procedures are followed in communicating with students who do not pass the examination. Copies of this correspondence will continue to be sent to the Degree Progress Office.

The Committee members may wish to make suggestions regarding the dissertation; the student will incorporate the required alterations into the final version of the dissertation. The Reading Committee will append their signatures to this final version,
if it meets with their approval. The dissertation may then be submitted to the University Degree Progress Office.

**MASTER’S DEGREE**

A Master’s Degree in Neurosciences is awarded only as a terminal degree from the Program. The requirements for completion of a Master’s Degree are the following:

1. Satisfy the unit and residency requirements set by the University for a Master’s Degree.

2. Complete of the course requirements for the Ph.D. degree with a grade of B or better.

3. Pass a Master’s Examination that consists of the presentation of a five-page research proposal on a topic that the student may or may not intend to pursue. The proposal may be the same as one written in partial fulfillment of a graduate course taken by the student. The quality and scholarship of the proposal and the student’s performance in the Graduate Program will be evaluated in an examination to be conducted by 3 members of the Neurosciences Faculty.

**UNIVERSITY REQUIREMENTS**

The University requirements for the PhD degree are detailed below. These requirements deal primarily with:

1. The minimal number of units of coursework required.

2. Steps that must be taken in order for the student to “advance towards candidacy” for the PhD.

3. The minimal number of quarters at full-tuition that the student is in “residence” at Stanford.

4. The final University Oral Exam.

**Unit requirements.** There are no specific course requirements. Candidates for the PhD degree must satisfactorily complete a program of study that includes 135 units of graduate coursework, reading and/or research. The *Stanford Bulletin* should be consulted for rules concerning transfer credit and other details.
Students in the program will ordinarily register for four quarters each year.

**Advancing to candidacy.** Students are expected to be “admitted to candidacy” once they have completed the Program’s qualifying procedures, usually by the end of the second year of doctoral study.

Admission to candidacy is an acknowledgment of the student’s potential to complete the requirements for the PhD successfully.

An “Application for Candidacy” must be filed by the end of Summer quarter of the second year in the Program in order to be admitted to candidacy for a PhD degree by Stanford University.

The form is forwarded to the Degree Progress Office of the Registrar’s office and indicates that the student is formally qualified for the PhD degree and is in good standing. It implies that the Program has made a careful review of the student’s progress.

The form requires a listing of Stanford coursework totaling at least 72 units. It indicates that the student has completed the qualifying examination and shows that he or she is still required to complete a Dissertation.

**Doctoral students are expected to complete their degree requirements in a timely manner. Therefore, candidacy is valid for five years unless terminated by the Program for unsatisfactory progress.**

The Program expects that generally all graduate students will complete their dissertation research within five years of entrance into the Program.

**PhD THESIS AND ORAL EXAMINATION**

When the student, Thesis Advisor, and Advisory Committee agree that the student has completed work of sufficient novelty and quality to merit the PhD, the student will write a dissertation. When the dissertation is acceptable to the advisor, it will be presented to the Oral Exam Committee. The student will then defend this dissertation at the University oral examination.
University oral examination. This requirement for the PhD degree was detailed previously. A summary of the paperwork involved is as follows. Once the student and Thesis Advisor have agreed on a Reading Committee, the names of the faculty on this committee shall be submitted to the Neurosciences Program Office on the Doctoral Dissertation Reading Committee Form. The date for the oral examination, which begins with a research seminar, should be scheduled and this information submitted to the Neurosciences Program Office on an Oral Examination Schedule Form. An abstract of the thesis is required at the same time. Both the Doctoral Dissertation Reading Committee Form and the Oral Examination Schedule Form must be received in the Neurosciences Program office at least three weeks before the scheduled date of the exam. The oral examination results are validated by the Chair and reported to the Program and the Degree Progress Office within five days of the examination.

Doctoral dissertation. The Doctoral dissertation is expected to be an original contribution to scholarship or scientific knowledge, to exemplify the highest standards of the Neurosciences, and to be of lasting value to the intellectual community. Students should refer to the booklet "Directions for Preparing Doctoral Dissertations", available online, or from the Neurosciences Program or Degree Progress Office. These guidelines should be read carefully before final preparation of the manuscript to avoid costly and time-consuming revisions. Previously published dissertations should not be used as a guide to preparation of the manuscript. Each member of the Reading Committee must sign the signature page of the dissertation to certify that the work is of acceptable scope and quality. One reading committee member reads the dissertation in its final form and certifies on the Certificate of Final Reading that specifications of the Neurosciences Program and of the University have been met.

The dissertation, signature page signed by the Reading Committee, and a signed publication agreement (to be completed by the Research Advisor), must be submitted to the Degree Progress Office. The student must apply for conferral of a graduate degree by filing an Application to Graduate (on Axess) before the deadline of the term. Once the dissertation, the signed publication agreement, and the Application to Graduate are submitted, the Degree Progress Office will begin the administrative process that results in the conferral of the PhD degree in Neurosciences, and the student may begin postdoctoral work.

Conferral of degrees. Deadlines for submission of dissertations are strictly enforced. Students who submit their dissertations after the deadline in a given quarter may obtain a Statement of Completion from the Degree Progress Office; official degree conferral will occur in the following quarter. You must be registered for the quarter in which the
degree is conferred or the immediately preceding quarter. Candidacy must be valid when the degree is conferred.

The Degree Progress Office should be notified in writing when conferral plans change. Students who withdraw their conferral request or who fail to complete degree requirements must file a new Notice of Intention for a subsequent quarter. A new Notice of Intention must be filed for each degree and conferral quarter.

**Application to graduate.** The Application to Graduate is submitted on-line via the student web application called Axess. It should be submitted by the deadlines listed in the University Calendar. Requests for conferral are reviewed by the Neurosciences Program Office and the Degree Progress Office to verify completion of degree requirements. In Summer, Autumn, and Winter Quarters degree certificates are sent to students within two weeks of the conferral date.

**Spring commencement.** Commencement ceremonies are held each June for students who have received degrees in the previous Summer, Autumn, Winter quarters and for students who are graduating in June. Students completing programs in June must submit a Notice of Intention by diploma deadline date to receive a diploma at June Commencement and to have their names appear in the Commencement Bulletin.

Information on Commencement activities and distribution of diplomas is sent by the Registrar’s Office in early April to addresses provided on the Notice of Intention. Students who wish to participate in commencement activities in advance of conferral of their degree may obtain a Graduate Student Petition to Walk Through Commencement Exercises from the Degree Progress Office from May 1 until the day before commencement. A Walk-Through petition should be requested only if there is no possibility of completing degree requirements for June conferral.

**HONOR CODE**

The Honor Code is the standard of academic conduct for Stanford students. The fundamental Standard has set the standard of conduct at Stanford since 1896. It states:

**Students at Stanford are expected to show both within and without the University such respect for order, morality, personal honor and the rights of others as is demanded of good citizens. Failure to do this will be sufficient cause for removal from the University.**

A. The Honor Code is an undertaking of the students, individually and collectively:
1. That they will not give or receive aid in examinations; that they will not give or receive unpermitted aid in class work, in the preparation of reports or in any other work that is to be used by the instructor as the basis of grading.

2. That they will do their share and take an active part in seeing to it that others as well as themselves uphold the spirit and letter of the Honor Code. This includes reporting an observed dishonesty in an examination to the course instructor.

B. The faculty, on its part manifests its confidence in the honor of its students by refraining from proctoring examinations and from taking unusual and unreasonable precautions to prevent the forms of dishonesty mentioned above. The faculty will also avoid, as far as is practicable, academic procedures that create temptations to violate the Honor Code.

C. While the Faculty alone has the right and obligation to set academic requirements, the students and faculty will work together to establish optimal conditions to honorable academic work.

The complete text of the Honor Code is printed in the annual Stanford Bulletin.

FINANCIAL AID

Stipends, RAships, and tuition. Students are fully funded for their entire course of study, assuming satisfactory progress toward the PhD degree. Students normally enter the Program on a Neurosciences Program training grant slot or with individual fellowships. Once a student joins a laboratory, he/she becomes the financial responsibility of the Principal Investigator of that laboratory for the duration of the student’s PhD research. Occasionally, students are fully funded on entry by a research assistantship (i.e., on a faculty member’s research grant) that includes payment of a stipend and tuition. Often, it will be a combination of these sources.

Students are required to apply for predoctoral fellowships from the National Science Foundation and the National Defense Science and Engineering Graduate Fellowship Program (NDSEG) by November of their first year in residence. These individual fellowships will pay a stipend and tuition for 3-4 years. Applications for both are available in October and due in the first week of November.
Loans and external awards. Graduate students who believe they will require loan assistance can apply for federal Stafford Student Loan, Federal Perkins Loan, and University loan programs. Inquiries for publications outlining loan program terms can be directed to Financial Aid Office, Bakewell Building, 355 Galvez Street; financialaid@stanford.edu; 650.723.3058. International students who are not permanent residents are not eligible for long-term loans.

Graduate Fellowships awarded by external sources (i.e., NSF and Ford) are administered at 355 Galvez Street.

Contact: Maureen Grey
Phone: 725.0868
Email: mogrey@stanford.edu

The NIH and NIMH training grants provide the Program with only partial stipend. The research assistantship supplements this deficiency.

All students appointed and supported by one of the Program’s training grants will be informed of the period of their appointment and the amount of funding awarded during their appointment.

Stipends. The stipend for Neurosciences students for the 2007-2008 academic year has been set at $28,000 regardless of the specific department in which they are rotating or carrying out thesis research. Students may, of course, receive more than this amount if they receive an individual fellowship that is set at a higher level.

Student fees, late fees, etc., are the responsibility of each student, though some fees may be covered through the funding received.

Students may receive stipends quarterly (from fellowships and training grants) or salary twice-monthly (from research assistantships).

For those students on fellowships who are paid quarterly, stipend checks are issued the day before classes begin. Checks for students who have not set up direct deposit are sent to the students’ local US mailing address listed in Axess.

Students who are paid semi-monthly through the Stanford University Payroll Office will be paid on the 7th and the 22nd of the month (or on the preceding work day if these dates fall on a weekend or holiday). Semi-monthly paychecks may be direct-deposited in local banks. “Live” checks are sent to the student’s campus mailcode (typically the
student’s thesis lab) entered into Axess by the Program Administrator. Students may enroll in Payroll Direct Deposit and view semi-monthly pay statements in Axess.

**Doctoral candidates are expected to be full-time students. Outside employment is strongly discouraged and should be discussed with the Program Director.**

**Tuition.** For the 2007-2008 year, tuition is $7,570 per quarter for 8-10 units and $11,600 per quarter for 11-18 units.

Your tuition award on your University bill will be reflected as a credit based on the tuition that is provided from your fellowship, training grant and/or research assistantship. These credits should take care of the student’s tuition needs.
**Taxes.** Tax Information (limited) is available in:

1. The Graduate Student Handbook.

2. The Bechtel International Center (for international students)

**Connie Reddy (good source of information)**
Tax Service Specialist
Controller's Office
655 Serra Street
Phone: 723.0241
creddy@stanford.edu
APPENDIX
TIMETABLE FOR ADVANCEMENT TO THE PHD DEGREE

Year 1
Laboratory rotations
Take courses
Meet quarterly with Program Advisor
Submit quarterly meeting form to Administrator
Select laboratory and Thesis Advisor

Year 2
Begin thesis research
Take courses
Meet quarterly with Thesis Advisor
Submit quarterly meeting for to Administrator
Select Thesis Advisory Committee and convene a meeting
Take Qualifying Examination or apply for an extension
Submit Qualifying Examination Certification form
Submit Application for Candidacy form
Submit Doctoral Dissertation Reading Committee form

Year 3
Thesis research
Meet with Thesis Committee
Submit Meeting Form to Administrator

Year 4
Thesis research
Meet with Thesis Committee
Apply for TGR status
Submit Meeting Form to Administrator

Year 5
Thesis research
Oral Examination Schedule Form
Oral Examination
Turn in Thesis
Submit Application to Graduate
QUALIFYING EXAMINATION CERTIFICATION

Candidate

Date of Examination

The advisory committee of the student named above certifies that the student passed the Qualifying Examination by demonstrating a breadth of knowledge in the field of Neurosciences and a depth of knowledge in the chosen field of specialization to qualify for candidacy and to pursue PhD thesis research.