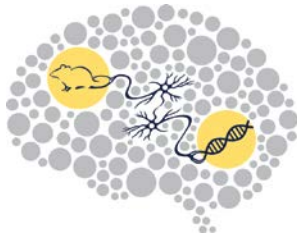


**DEPARTMENT OF
NEUROBIOLOGY & BEHAVIOR**

University of California, Irvine



Department of
Neurobiology *and* Behavior
Exploring the Brain: From Molecules to Mind

**Graduate Student
Handbook
2017-2018**

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Contact Information

NEUROBIOLOGY AND BEHAVIOR

<http://neurobiology.uci.edu/>

Many staff and faculty will help you throughout your academic career at UC Irvine. Here is an introduction to some of them.

Dr. Marcelo Wood Department Chair 2205 McGaugh Hall 2205 (949) 824-6114 mwood@uci.edu	Dr. Wood welcomes graduate students to discuss all aspects of their graduate career with him. As the head of the department, he has the responsibility of representing the department in all administrative matters, supervising all department teaching, providing oversight for all contracts and grants and all animal and human protocols, and approving all department policies and procedures.
Dr. Kim Green Department Vice-Chair 3208 Biological Science (949) 824-3859 kngreen@uci.edu	The Vice Chair's main responsibility for graduate education is regarding teaching, e.g. matters related to Teaching Assistant (TA) policy and assignments. The Vice Chair also is available for general questions about graduate education.
Dr. Ian Parker Graduate Student Advisor 1217 McGaugh Hall (949) 824-7332 iparker@uci.edu	The Graduate Advisor is the official representative of the Dean of Graduate Division. As advisor, he is responsible for the supervision of graduate study, student lab advisor assignments and changes of those assignments, approval of courses outside the department as satisfactory of departmental requirements, and approval of advancement and dissertation faculty membership committees. He also serves as a liaison between students and faculty, representing the interests of graduate students.
Graduate Student Representatives: Susan Gil gils1@uci.edu Maria Montchal mmontcha@ucil.edu	The graduate student representatives are elected by graduate students and serve two-year terms. The representatives attend faculty meetings and serve as the student voice. They also bring information back from the faculty and central administration to the students. During faculty and graduate recruitment, the representatives schedule meetings between graduate students and prospective candidates.

Department Administrative Staff

<p>Sally Dabiri Department Administrator (949) 824-4727 sfdabiri@uci.edu</p>	<p>Department operations management; faculty recruitment, merits and promotions and sabbatical leaves; Graduate student support; General operating budget; Lecturer recruitment and appointment</p>
<p>Brian Paredes Purchasing Analyst (949) 824-4719 brian@uci.edu</p>	<p>Processing requisitions of all materials and supply; responsible for the daily activities of the Purchasing and the required on-going interaction with vendors; primary contact and facilitator for all department space, inventory and equipment needs.</p>
<p>Victoria Leung Finance Analyst (949) 824-4529 vleung1@uci.edu</p>	<p>Contract and grant accounting; processing of accounting forms including purchase orders; reconciliation of ledgers; preparation of reports.</p>
<p>Lin Xi Senior Finance Analyst (949) 824-5251 lxix@uci.edu</p>	<p>Management of departmental operation funds. Assistant to Chair; faculty recruitment; Contract and grant accounting; processing of accounting forms including purchase orders; reconciliation of ledgers; preparation of reports.</p>
<p>Naima Louridi Administrative Analyst (949) 824-8519 nlouridi@uci.edu</p>	<p>Graduate student admissions and recruitment; schedule of classes; general catalog; textbook coordination; undergraduate enrollment; photocopying for teaching purposes; course reports; teaching evaluations; graduate student files; preparation of exams and course materials; conference room scheduling.</p>
<p>Sharon Suh Finance Analyst (949) 824-2395 sharos2@uci.edu</p>	<p>Contract and grant accounting; processing of accounting forms including purchase orders; reconciliation of ledgers; preparation of reports.</p>

Other Staff You Should Know

Name	Title	Phone
Dr. Karina Cramer	INP Director	4-4211
Gary Roman	INP administrator	4-6226
Vicki Thomas	Assistant to Dr. LaFerla	4-5315

Faculty E-Mail

Faculty Name	E-Mail
Ruth Benca	rbenca@uci.edu
Matthew Blurton Jones	mblurton@uci.edu
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Graduate Student Contact Information

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White, Terra	Guzowski	tewhite@uci.edu

School of Biological Sciences Contact Information

<http://www.bio.uci.edu/>

The Department of Neurobiology and Behavior is one of four departments that constitute the School of Biological Sciences. The other three departments are Developmental and Cell Biology, Ecology and Evolutionary Biology, and Molecular Biology and Biochemistry.

Department Offices	Location	Extension
Neurobiology and Behavior	2205 MH	4-8519
Molecular Biology & Biochemistry	3205 MH	4-6034
Developmental & Cell Biology	2011,BS3	4-6681
Ecology & Evolutionary Biology	321A SH	4-6006

School Offices	Location	Extension
Administrative Offices	5120 NSII	4-5315
Facilities Office	5211 NSII	4-8085
Undergraduate Student Affairs	BioSci III, 1st floor	4-5318
Computing Support Helpdesk	2113 NSII	4-3555

Organized Research Units	Location	Extension
Center for the Neurobiology of Learning and Memory	320 QRL	4-0314
Institute for Memory Impairments and Neurological Disorders	Bio Sci III	4-3253
Cancer Research Institute	236 Sprague Hall	4-5886
Reeve-Irvine Research Center	1105 GNRF	4-0210
Center for Hearing Research	Med. Sciences E, 101	4-1539
Center for Autism Research	2056 Hewitt Hall	4-3484
Sue and Bill Gross Stem Cell Research Center	4038 Gross Hall	4-2487
Irvine Center for Addiction Neuroscience	2205 MH	4-5251

Facilities	Location	Extension
Image Works - Electron reproduction microscope and photography	2112 NS1	4-6414
Optical Biology Core Facility	4443 MH	4-3856
Dishwashing/Autoclave Facility	4311 MH	4-6040
Arboretum	See campus map	4-5833
Greenhouse	See campus map	4-6049
Vivarium	MH Basement	4-9538
Image Works Copy Center	2112 NS1	4-6414
Computer Room (scantrons)	2115 NS1	4-1120
Dale Herklotz Conference Room	QRL, CNLM	4-8519

School of Biological Sciences

<http://www.bio.uci.edu/>

Name	Title	Location	Extension
Frank LaFerla	Dean	5120 NSII	4-5316
Michael Mulligan	Associate Dean, Graduate Studies	5219 MH	4-8433
Raju Metherate	Associate Dean, Undergraduate Studies	2221 MH	4-6141
Benedicte Shipley	Assistant Dean	5120 NSII	4-5558
Kristin Caplin	Personnel Director	5101 NSII	4-5467
Yuanshun Chen	Director of Finance	5109 NSII	4-4247
Robyn Stiffler	Facilities Director	5211 NSII	4-8284
Matthew Martinez	Computer Resource Manager	2115 NS I	4-8832
Jenna Bague-Sampson	Director, Bio Sci Student Affairs	1310 BS3	4-0326

Graduate Program in Neurobiology & Behavior

The expectations, requirements, and recommendations for making satisfactory progress toward completion of the graduate program in Neurobiology and Behavior (NB&B) are summarized here. Most students will enter the NB&B program in their second year at UCI following a year in the gateway Interdepartmental Neuroscience Program (INP); although it is also possible to enter the program directly in the first year, or through a different gateway program. Graduate students should also review the policies and procedures of the Graduate Division as summarized in the UCI catalog (<http://catalogue.uci.edu/>).

Timeline

First Year

Course Work

Most students will spend their first year at UCI in the INP gateway program, and transfer to the NB&B graduate program at the end of that year. Entry into the NB&B program requires that students satisfy all requirements of the INP program. The NB&B program further requires satisfactory completion of each part of the NB&B core curriculum, performing at a higher than satisfactory level in at least some courses.

The core curriculum is:

- Neurbio 206: Molecular Neuroscience
- Neurbio 207: Cellular Neuroscience
- Neurbio 207L: Cellular Neuroscience Lab
- Neurbio 208A: Systems Neuroscience
- Neurbio 209: Behavioral Neuroscience

Students in the INP gateway program who envisage transferring to the NB&B graduate program are thus strongly advised to take the above courses in fulfilling the Molecular, Cellular and Systems requirements of the INP program. If the Neurbio 209, Behavioral Neuroscience course is not taken during the first year, this must be taken during the second year, after entering the NB&B graduate program.

Students who enter through other gateway programs are similarly required to satisfy all requirements of that program, and will generally be required to take all of the NB&B core courses during their second year; although an exception may be granted by the Graduate Advisor to substitute one or more core courses taken in that program.

Research

The excitement of research provides the primary motivation for most students selecting a career in neuroscience and behavior. During first-year research rotations, it is important to stay in close touch with the research efforts of the lab with which you are affiliated and to attend the lab's meetings and seminars. Students planning to enter the NB&B graduate program should identify a research mentor associated with the program by the end of the first year. You can consult the Graduate Advisor and/or Chair for advice on this and other issues at any time.

Evaluations

Students are expected to have an overall GPA of 3.3 or higher by the end of the first year and to have met all the requirements of the gateway program in which they are enrolled. The Graduate Division requires graduate students to have a GPA of 3.1 or higher to serve as TAs. At the graduate level, a grade of B (3.0) indicates satisfactory performance. Students with a B- grade in a single core class may be granted an exception to enter the NB&B graduate program, but are placed on conditional academic status and are required to retake that class and obtain a passing grade (B or higher). Students on conditional academic status are also expected to exceed the department's basic expectations in their regular work while making up earlier deficiencies. To continue in the program, students must have an overall GPA ≥ 3.3 and have satisfactorily made up any core course deficiency.

Students obtaining B- grades in two classes, or a grade of C+ or below in a single class during their first year will not be permitted to enter or continue in the NB&B program until the deficiency is remedied.

Second Year and Beyond

Teaching

The policy of the School of Biological Science is that graduate students TA a minimum of two quarters at 50% time before they graduate. This total can be reached using up to four 25% TA assignments, as needed. The Department of Neurobiology and Behavior implements this requirement mainly by having students support the undergraduate neurobiology laboratory, N113L. The requirement is as follows (details may change depending on graduate class size and department needs):

Second year at UCI

- Winter: 25% TA, observing and grading N113L
- Spring: 50% TA: teaching N113L at 25%, grading N113L at 15% and grading & supervising N110 at 10%

Third year at UCI

- Winter quarter: 25% TA, teaching N113L

Students may TA beyond the required amount if they are interested in gaining additional experience or funds (not to exceed stipend level). The department currently has ~30 slots each year for assisting with N113L (Head TA or TA Trainers) or large lecture courses (non-majors, upper division majors and freshman biology). The freshman biology course (Bio 93), in particular, has a strong mentored-teaching component and is highly recommended for students with an interest in teaching.

Related information:

- a. Students on most federal fellowships or training grants may not receive TA appointments greater

than 25%. In these cases, students will not TA a second course at the same time as they teach N113L at 25% (in their first Spring quarter), but will need to complete the overall TA requirement before graduation.

- b. Students supported by a GAANN grant should expect to TA while on the grant, and the assignment should be carefully selected to include a strong mentor component for the student. Students may receive up to 50% TA appointments.
- c. Per campus-wide practice, students in the MSTP (MD-PhD program) do not have TA requirements.

Seminars and Research Presentations

In addition to course work and research, students participate in seminars and other activities. Neuroblitz is a student-run activity in which graduate students deliver presentations on their research, followed by questions and feedback. The program was created as a way to allow students to practice presenting their research in a comfortable and yet formal environment.

Annual Advisory Committee Meetings

Students must meet annually with a faculty advisory committee, except when they are advancing (normally in the 3rd year) or defending (normally in the 5th year), and submit a meeting report to be placed in the student's file. The policy on Annual Advisory Committees and the form to be filled out by the committee can be obtained from Naima Louridi in the department office. Students should consider members of their advisory committee to be scientific mentors, and should feel free to meet with them informally throughout the year. Advisory committee members will provide guidance to help develop the thesis project; in this way, the coherence and completeness of the project will be monitored throughout the student's graduate career.

Presentation of an Individual Development Plan (IDP) is required for all graduate students at the annual thesis committee meeting. The IDP will be prepared in consultation with the thesis advisor, presented at the first thesis committee, and updated annually at all future thesis committee meetings. The IDP should describe the student's career goals, desired training, and milestones associated with professional development and academic training (fellowship applications, technical workshops, meeting presentations, pedagogical training, development of communications skills, etc.).

Course Work

In their second year, students can begin taking advanced courses. Students are encouraged to satisfactorily complete at least two advanced graduate courses before advancing to candidacy and are required to complete at least four before the dissertation defense. With the consent of the graduate advisor, graduate courses from other departments may satisfy part of this requirement if they are not primarily introductory or technically-oriented. Students are encouraged to begin taking advanced courses in their second year and are expected to maintain a GPA of 3.3 or higher.

Evaluations

Students are evaluated once a year, at the end of spring quarter, unless they are on conditional academic status or are behind in their progress toward the Ph.D. Evaluation of students who have completed the core is based on (i) performance in advanced courses; (ii) laboratory research; (iii) timely preparation for and performance on the advancement to candidacy exam; and (iv)

teaching. If a student's performance has fallen below the department's expectations in more than one course, more than one area (e.g., course work and research, course work and teaching or research and teaching), or more than one quarter, or if the student has not made up deficiencies in a timely manner, the faculty may immediately recommend that the student be academically disqualified by the Graduate Division.

Advancement To Candidacy

In consultation with their research advisor and the Graduate Advisor, students should select an advancement to candidacy committee no later than spring quarter of their third year. Through individual and/or group meetings with the committee members, the student should take good advantage of their expertise when developing a research plan for the dissertation and critiquing the literature in that area. The student should take the initiative in seeking their advice and should not postpone contact with them until the advancement to candidacy exam.

Before the end of the spring quarter of the third year, students are expected to write an advancement document that includes 1) a critical review of the literature in the area in which they plan to do their dissertation and 2) a proposal presenting plans for the dissertation research. The scope of this document will depend on the research area, and students generally consult with their research advisor and committee members to determine an appropriate range of topics. In addition, student are expected present this work to their Advancement Committee and to take the advancement to candidacy exam. The area defined by the review and proposal provides a focus for much of the oral exam, but candidates are expected to be able to discuss issues and answer questions in the broader domain of neurobiology and behavior. Details on the format for preparing the review and proposal are available from the graduate advisor, and examples of previous advancement documents can be obtained from the Department Office. The advancement document should be distributed to the committee at least a week before the exam.

Advancing to candidacy in the spring of the third year gives students two years to complete their Ph.D. within the department's expected time-to-degree of five years. Students for whom a second exam must be scheduled are expected to pass it by the end of the next quarter. Students may advance to candidacy well before the deadline indicated, but those that have not met the deadline will not be considered to be making normal progress to the Ph.D.

The advancement committee, which must be approved in advance by the Graduate Advisor, generally consists of your research advisor, three additional Neurobiology and Behavior faculty members and one "outside" member, for a total of five. The committee must have a minimum of three Neurobiology and Behavior faculty.

The student may prepare Ph.D. Form I (Report on Qualifying Examination) before the exam for signatures by the committee members after the exam. The student then indicates on the form the three faculty members who will serve as the Ph.D. dissertation committee: two departmental faculty who served on the advancement to candidacy committee plus the student's research advisor. The form is delivered to the Cashier's office by the student with their check for \$90.00, which partially covers microfilming of the dissertation. The stamped form is then returned to the department. If the student does not pass the oral exam, a second exam will be scheduled before the end of the next quarter. Having prepared a research proposal and received critical comments from the committee, students who have advanced to candidacy may choose to submit their proposal as part of an application for an individual pre-doctoral fellowship to NIH or another source. This decision should be made in consultation with the research advisor and graduate advisor.

After advancement to candidacy, students may optionally submit paperwork and obtain a master's degree. Contact Naima Louridi to submit paperwork.

After advancement to candidacy (AtC), annual thesis committee meetings should directly assess and provide guidance for academic publication.

Doctorate Thesis

Students are expected to complete their research, write their dissertation and successfully defend it by the end of their fifth year. Students should work closely with their dissertation committee throughout the time from advancement to candidacy and completion of the degree. By the policies of the University of California, the final exam is open to the public but the privilege of examining the candidate remains with the committee unless extended by the chair.

Students must enroll and pay fees every quarter until they complete the requirements for the degree. If all of the requirements are satisfied except submission of the final version of the dissertation or completion of the final exam, a student may apply to pay only a filing fee. By the end of the quarter for which the filing fee was paid, the dissertation must be approved by the manuscript advisor in Graduate Division. During the quarter for which the filing fee was paid, the student normally may not use University services (e.g., the library) or be employed by the university as a TA, graduate student researcher or in any other capacity. Students are allowed to receive employment positions (GSR/TA) during Summer while on filing Fee and maintain housing and library privileges.

The dissertation must be prepared according to guidelines available online:

<http://etd.lib.uci.edu/electronic/tdmanuale>.

Dissertation Defense and Pre-Defense Exam

PhD candidates will schedule a "pre-defense" meeting with their dissertation committee for an oral examination based on a near-final draft of the dissertation. The meeting will be scheduled only after the draft is delivered to the committee, to ensure at least two weeks for evaluation. At the meeting, the student will give a brief oral presentation and answer questions about the draft. The committee may identify problems with the dissertation that should be addressed in the final draft. Note that the intent of this meeting is to strengthen the written document and not, for example, to identify problems with the experimental design (which should have been identified earlier, e.g., during annual advisory meetings). When the committee has signed off on the revised, final draft, only then can the public oral defense be scheduled.

After the public defense the committee and student will meet briefly behind closed doors for feedback on the presentation and to sign the paperwork.

During the final year of graduate study, doctoral students will present a detailed plan for post-graduate career development and employment to the thesis committee at 6 to 12 months in advance of degree completion

Submitting Your Manuscript

The library is very particular about the format of the manuscript. A manual has been prepared for you to follow and is available for purchase from the UCI Bookstore. The manual is also available at the Libraries Research Resource website located at <http://etd.lib.uci.edu/electronic/tdmanuale>.

Matriculation

Before candidates leave UCI, they are expected to do each of the following:

- Provide the department with three clean copies of the manuscript. The department will pay for one copy. You will need to take copies to a bindery company. Kater Crafts is recommended by the UCI Library (<http://www.katercrafts.com/welcome.htm>).
- Pay all departmental liens.
- Return all departmental and school property (e.g., keys, etc.).
- Sign all personnel and payroll forms.
- Provide the department with the title and location of the first employment opportunity.
- Provide the department with a forwarding address.
- Advise the department of the disposition of reprint requests (i.e., forward or refer elsewhere).
- If at any time during their training, candidates received support from the training grant or a fellowship, they must file a termination report with the supporting agency.
- Meet all Office of Graduate Division requirements.

IMPORTANT FORMS

Advancing to Candidacy

Ph.D. Form I: Report of the Ph.D. Candidacy Committee

<http://www.grad.uci.edu/forms/>

Defending A Dissertation

Ph.D. Form II: Report On Final Examination For Ph.D. Degree

<http://www.grad.uci.edu/forms/>

Ph.D. Dissertation Submission

Dissertation-Thesis Approval Form

<http://www.grad.uci.edu/forms/>

Services

UCI Campus Services

Graduate Division

<http://www.grad.uci.edu/>

The **Dean of Graduate Division** administers graduate education in accordance with academic policies established by the Academic Senate and by the Graduate Council, a standing committee of the Irvine Division of the Academic Senate. The staff of Graduate Division is prepared to answer questions about admissions, academic policies and procedures, graduate programs and degrees, financial assistance, student services, and other matters of concern to graduate students. They are available at Aldrich Hall 120, x4-4611.

Registration / Enrollment

<https://www.reg.uci.edu/registrar/soc/webreg.html>

Your registration at UCI consists of two separate steps that must be completed to be officially registered:

1. Enrollment in classes with a minimum of 12 and a maximum of 16 units.
2. Payment of fees; Once you have registered, your fees (which are paid for by the department or lab) are electronically transferred to the Cashier's office.

Be sure to register and see that your fees have been paid for each quarter by the deadline online through WebReg (<http://www.reg.uci.edu/registrar/soc/webreg.html>). You will be charged a late enrollment fee of \$50 if you are not enrolled at the end of the second week of instruction. Also be aware, late registration may affect your FICA status. If your account shows a positive balance for fees, contact the department office right away.

Address Changes

<http://www.reg.uci.edu/request/changeaddress.html>

Address information should be updated with the department. Please change your university records via StudentAccess (Frequently campus offices use e-mail to communicate with students so be sure to activate your UCINetID and check your e-mail frequently).

Student Photo ID Card

<http://uci.bncollege.com/webapp/wcs/stores/servlet/BNCBHomePage?storeId=88256&catalogId=10001&langId=-1>

UCI photo ID cards are often required when conducting business with various campus services. The IDs

are available for all graduate students at **UC Bookstore, the Hill** in the Student Center. Once your employment appointment is in place in our personnel records, take your student and employee identification numbers with you to obtain your UCI photo ID card.

Parking

<http://www.parking.uci.edu/>

<http://www.parking.uci.edu/at/modes/octa.cfm>

All vehicles must display a valid UC Irvine parking permit when parked on campus or used metered spaces. The parking and Transportation Service Office is located in Room 200 in the Public Services Building, at the corner of Berkeley and Pereira.

All graduate students are eligible to register for the free sustainable transportation program. This allows you 60 parking passes for the year. For students living on campus, it also allows unlimited nighttime and weekend parking. Register at <https://www.parking.uci.edu/AT/>.

A good way to avoid parking costs is to ride the OCTA bus. For \$169 membership fee, you can purchase a “University Pass” card for unlimited access to the Orange county Transportation Authority’s (OCTA) bus system 24 hours a day through the county. The card is valid from the time you enroll until June 30th.

The Anteater Express is a UCI-run bus system. Rides between graduate student housing and the main UCI campus are free. <http://www.shuttle.uci.edu/>

Internet

<http://www.oit.uci.edu/>

Office of Information Technology (OIT) operates the UCI campus network and telephone system. UCI offers mobile internet access via Wi-Fi across many locations on campus. UCInet Mobile Access provides UCI affiliates and visitors a fast and convenient way to connect to the web with mobile computers and devices.

E-Mail

<https://activate.uci.edu/activate/menu.php>

UCI provides free e-mail accounts to all its affiliates - faculty, staff and students. When you receive your employee or student ID number you will automatically be given an e-mail account. University offices frequently use e-mail to communicate information to students, so it is important to activate your UCINetID and check your e-mail frequently. To activate your account, go to the website and follow the on-screen instructions.

Anteater Recreational Center

<http://www.campusrec.uci.edu/>

The Anteater Recreational Center (ARC) is equipped with two different gymnasiums, an elevated running track, a rock climbing wall, a fitness lab, and several activity rooms. Its Aquatics Plaza contains a 25 by 25 yard heated recreational lap pool and a 10,000 square foot weight and cardio room. Students can pursue their own fitness programs or participate in a full myriad of campus recreation programs. These programs include in-line skating, scuba, kickbox aerobics, Aikido, sailing and more! Tours of the ARC are available by calling x4-5346 to make an appointment. ARC Fee is included in your fees and paid

except during Summer.

Housing

<http://www.housing.uci.edu/>

The Housing Office, located at G458 Student Center, x4-7247, provides a wide variety of affordable housing options on campus with different amenities and living arrangements such as studios, one, two, and three-bedroom units, townhouses, flats, graduate residence hall, laundry rooms, recreation rooms, park, child care centers, gardens, and internet connections.

In addition, they provide information and services to help students locate and obtain off-campus housing, including lists of apartments, houses for rent, rooms for rent in private homes, roommates wanted, roommates available, and temporary housing. The housing office publishes “Living Around UCI”, a guide to local apartment communities which includes information about rental prices, local realtors, budgeting expenses, roommate selection, and tenant/landlord rights and responsibilities. For more detailed information please visit their website.

Safety Training

<http://uclc.uci.edu/>

Graduate students are required to complete a variety of online safety training modules. Some of these are specific to the laboratory environment, while some are required for all graduate students.

School of Biological Sciences Services

A variety of services and equipment are available through the School of Biological Sciences; most will require a grant or other fund number.

Image Works

<http://imageworks.bio.uci.edu/>

Image Works, located in 2112 Nat Sci 1, x4-6414, provides a large number of services, including production of slides, film development, black and white prints, color scanning of images and gels, high resolution drum scanning, wide format poster printing, binding, as well as a full-service copy center. The facility manager is Matthew Martinez.

The slide making service is available either as a self-serve (training required for use of the instant slide machine), or by dropping off originals for pick-up two days later. Twenty-four hour service is available for an additional fee.

Dishwashing and Autoclaving

<http://www.bio.uci.edu/research/services-and-resources/>

Dishwashing and autoclaving facilities are located on the third floor of Steinhaus Hall and the fourth floor of McGaugh Hall.

Vivarium

Animal care facilities are located in McGaugh Hall, Steinhaus Hall, and the Bonney Research Laboratory. Access to these areas is restricted; Jefferson Chau, Vivarium Manager (jlchau@uci.edu and x4-9538) must grant permission. Please be certain to check with your faculty advisor for instructions about the care and handling of research animals. All laboratories have protocols approved and on file.

Computer Services

<http://comp.bio.uci.edu/>

Computer support is provided free of charge to the School of Biological Sciences faculty, staff, and graduate students. This is your starting point for help with computing problems.

- Visit their walk-in support center in 2112 NS1.
- Call to talk with helpdesk support staff at x4-3555 (949-824-3555) from 8:00a.m. to 6:00 p.m. weekdays.
- Email for assistance to bcshelp@uci.edu
- Urgent messages can be left at x4-3555 (#4 to mark urgent) for after hour requests on weekends and holidays. Staff is automatically paged and you will be called back.

BCS has various media equipment on loan in their office, such as computer projector, laptop, etc. To reserve equipment, call ahead at least a day in advance to their helpdesk.

Travel Funding

Some research-related expenses, such as travel, can be obtained through Dr. Michael Mulligan, Associate Dean of Graduate Affairs. If you are presenting a poster at a scientific meeting, such as the annual Society for Neuroscience, send him a written request detailing your travel i.e., expenses, location and title of your presentation, and he will reimburse up to ~\$300.

Department of Neurobiology & Behavior Services

Mail Boxes

All graduate students are assigned a locking mailbox located just outside the department office. Please be careful not to misplace your key, as they are difficult to replace. Please check your box regularly for class information, announcements, telephone messages, documents to be signed, etc. Your official department address is University of California, Irvine, Department of Neurobiology and Behavior, 2205 McGaugh Hall, Irvine, CA 92697-4550.

Mail Service

Mail related to University business can be mailed from the department office. Outgoing off-campus mail must contain your name, return address, "zot" code, and your lab mail code. Your advisor or bookkeeper can help you to determine the correct mail code. On-campus mail should include at least a zot code and a department name. A list of campus zot codes is in the campus telephone directory. Mail pick-up and delivery is approximately at 10:00 am. Departmental letterhead and envelopes are available upon request from the department office.

Fax

You may use the fax machine in the department office to receive and send faxes. The fax number is 949-824-2447. Faxes addressed to you are put in your mailbox. If you send a research-related fax, use your lab account number on the fax log and your advisor's permission to use the account. Personal faxes are allowed, but you will be asked to reimburse the department for the cost.

Telephones

<http://www.oit.uci.edu/>

To dial on-campus extensions, first dial 4, for example, 4-XXXX.

To call off-campus, dial "9" and then the number.

If you wish to reach UCI emergency assistance from a cellular phone, you must dial 949-824-5223 to reach the UCIPD emergency dispatch line.

Photocopying

Photocopy machines in McGaugh Hall are located on the second and fourth floors. These copiers require code numbers, available from your faculty advisor. See photocopier key operators for help with copier problems, and also to make certain you are using the correct name brand for transparencies. Photocopiers are also located in the libraries.

To copy materials for classes you are teaching or serving as TA, see the Administrative Analyst in the department office for the copy code. **Copies made for classes are not to be charged to your advisor's copy number.**

Bulletin Boards and Announcements

You may subscribe to a weekly listserv calendar of seminars in the life sciences, presented at the UCI College of Medicine and Biological Sciences campuses. To subscribe and unsubscribe, please follow the below instructions:

To subscribe or unsubscribe send an email with the correct body message email address below to the listserv:

- 1) Send an email message to: listserv@uci.edu
- 2) In the body of the message type only the line:
SUBSCRIBE BIO-SCI-SEMINARS YOUR NAME or...

UNSUBSCRIBE BIO-SCI-SEMINARS YOUR NAME

The School of Biological Sciences also offers an on-line calendar of coming events and seminar at: <http://www.bio.uci.edu/events/>

Bulletin boards on first and second floors of McGaugh Hall contain class information, seminar notices, research and academic job opportunities, and a variety of other information.

Building Emergencies

For emergency reports, please call Facilities Management Service Desk, (949) 824-5444, or after hours call Central Plant at (949) 824-5520

Fellowships

If you and your advisor decide that you should apply for an NIH or private fellowship, contact Jason Park at X4-5593 for assistance. He can help you identify potential funding agencies and will guide you through the application process. Never send an application directly to an agency.

Finances

Purchases

PO/PALCards

To order supplies and/or equipment, you will need to complete a Purchase Order worksheet and have your faculty advisor sign off. To submit for purchase, you will need to login to KFS (Kuali Financial System), complete the requisition and upload the PO worksheet as signature approval in the Notes and Attachments tab. There is a \$25.00 minimum purchase. If any questions, please contact the Purchasing Analyst to assist. **Never place a purchase order directly with a vendor.** PALcards are UCI credit cards used for the purchase of goods and services that may be available in your lab. Always check with your faculty advisor and lab manager to determine the specific purchasing procedure for their lab.

Repairs

Equipment repairs are considered an outside purchase, whether you will be charged for the repair or not. **Always check with NB&B Finance staff before you take or send any UCI Equipment off-campus.**

On-Campus Stores

Before purchasing any item on campus, make sure you have your faculty advisor's approval and the appropriate recharge number with your KFS account and project number .

Always obtain a receipt for your purchase and forward it to NB&B finance staff.

Reimbursements for Supplies

For purchases of \$100 or less, you may choose to pay for the supplies with your own money and be reimbursed. However, **please note that buying with own funds should be last resort and for urgent matters. It is highly discouraged since you are not an approved buyer for UCI.** To do this, you must have a **receipt and a detailed explanation of how the items are being used in your research.** Your receipt **must** have the store name printed or stamped on it and a printed product description, and date of purchase. All receipts must be submitted for reimbursement within 15 days of the purchase date.

Bring your receipts with your explanation/description of their use to NB&B accounting staff for reimbursement. We prefer to prepare a Disbursement Voucher reimbursement depositing the funds directly into your checking account.

A Disbursement Voucher document will be completed by NB&B accounting staff, which will require your faculty advisor's signature on the cover sheet. You will receive e-mail notification from UCI's Central Accounting that a deposit has been made to your account.

Travel Reimbursements

Here are some guidelines to help you plan your trips for university business. Please keep this handy for future reference, but if you have any questions, please ask your finance analyst. It is to your advantage to plan ahead for your trip as much as possible. This advance notice also helps the administrative staff prepare the required paperwork. When you are going somewhere, let us know and we will help you through the process.

How to Pay for Your Trip

After approval from your faculty advisor, travelers normally register for a scientific conference and book their own domestic flights through an on-line resource called CONNEXXUS. Connexus is a UCI's preferred method for making travel arrangements. Any UCI employee who needs assistance accessing Connexus may contact Alexa Lopez via telephone at ext. 4-3032 or through email at askconnexus@uci.edu
https://portal.uci.edu/uPortal/f/u3011s6/p/webproxy-cms-file-view.u3011n140/max/render.uP?pP_cmsUri=public%2FAccounting%2FTravel%2FHowToUseConnexus.xml

Please ensure you have a TEM profile created in KFS. If you do not, please contact your finance analyst for assistance. Please complete the TEM checklist (your finance analyst can provide it to you), include all information, obtain your faculty Advisor signature, and project/account to be charged. Students must submit original receipts for airline tickets, lodging, meals, car rentals, taxis, registration, etc., to the finance analyst. The reimbursement is processed within 3 weeks through direct deposit.

If you are planning a trip outside of the United States, please see NB&B Accounting staff first! Many restrictions apply to foreign travel that may need to be resolved before you register or book your flight.

Paychecks

Paychecks are available on the first of every month and will be available for pick-up after 2:00pm. If the first of the month falls on a weekend or holiday, checks will be available on the last workday prior to the first of the month. **The only exception is January 1.**

Graduate Student stipends can be paid via check or direct deposit. Checks should be picked up at 2205 McGaugh Hall. Direct deposit is available and often preferable to receiving a paycheck that you must take to the bank. You may review your check stub through "At Your Service" at the following link: <https://atyourserviceonline.ucop.edu/ayso/>

This is the same information that is normally shown on a check stub and will show you how much was deposited into your account. If you are interested in this option, please contact the Personal Analyst Ext. 4-4529. Reimbursement checks for entertainment, travel expenses, supplies, etc., will also be direct deposited.

Each of you received a letter describing the salary level at which you will be paid during your first year in our program. The sources from which you will be paid each year may vary as the department has several different types of funding sources. Each new academic year begins July 1.

University fellowships may supply not only a stipend but also the payment of out-of-state tuition and/or applicable educational fees. Other support will be paid from teaching assistantships and graduate student research appointments.

Some advanced students are paid from pre-doctoral training grants. Some others are paid by individual pre-doctoral fellowships (for which they applied) from the National Institutes of Health or the National Science Foundation. As fellowship and training grant checks are not produced through the payroll system, no deductions for taxes, social security, etc. are taken from them. However, according to the tax laws which went into effect 1/1/87, the income received from such sources is tax liable. You will want to be putting some money aside to pay the tax obligation. The Internal Revenue Service publishes a "Students Guide to Federal Income Tax" which explains the federal tax laws that apply to you. It describes your responsibilities in filing and paying taxes, how to file, and how to get help. To order IRS Publication 4, call (800) 829-3676.

Federal Student Aid

Financial aid to graduate students is available from the Federal government in two forms. The first is grants and fellowships, and the second is student loans. For both types, you need to file a Free Application for Federal Student Aid. The FAFSA form can be obtained from the Financial Aid office at 102 Aldrich or it can be completed on-line at <http://www.fafsa.ed.gov/>. The application instructions are fairly straightforward.

Retirement Plan

Retirement Benefit Defined Contribution Plan (DCP) Safe Harbor is a valuable component of the UC Retirement Saving Program offered to the University community. DCP is not a tax but a mandatory contribution to a self-directed investment account and is administered by Fidelity Investments. The enrollment in DCP automatically happens on the first day of an appointment. During the academic quarters when you are 1) enrolled in classes and hold a 50% appointment no DCP and Medicare are deducted from your pay check. During Summer when you are not 1) enrolled in classes and 2) hold an appointment greater than 50% DCP and Medicare are deducted from your paycheck.

https://portal.uci.edu/uPortal/f/welcome/p/webproxy-cms-file-view.u2011n201/max/render.uP?pP_cmsUri=public%2FAccounting%2FPayroll%2FInfoPagePayrollIDeducationTaxes.xml

What are your responsibilities?

- Register for classes on time, every quarter.
- If you want to deposit your contribution in something other than the Savings Plan, transfer your balance on-line.
- Upon separation from the University, complete a DCP Distribution Kit available in the department office.

Establishing Residence

<http://www.reg.uci.edu/registrar/residence/>

The UC system is considerably more expensive for non-California residents. During your first year as an out-of-state graduate student, non-resident tuition is paid by the department but after that, you are still non-California resident, you will be responsible for this charge. It is therefore vital that out-of-state domestic students establish themselves as California residents during their first year. In order to be considered as a resident, you must obtain a Petition for Resident Classification from the Office of the Registrar, fill it out, and return it to them by the appropriate deadline. You then produce the required proof of residency at the end of one year. The following items are useful in demonstrating residence: Personnel Report showing date employment started, California Driver's License, California automobile registration, California voter card, California income tax return, bank statements, utility bills, and rent receipts, especially for summer months. Please be sure to update your permanent address to your home address right away.

If you don't start the proceedings early, you won't establish your residency in time and will have to pay the higher fees. Contact the Residence Deputy in the Office of the Registrar, at X4-6129 or regres.uci.edu if you have questions, or look at the Registrar's Office website at <http://www.reg.uci.edu/navigation/residency.html>

Medical Insurance

http://www.shs.uci.edu/Health_Insurance_Privacy/Insurance.aspx

University of California Student Health Insurance Plan (UC SHIP) is the University sponsored health insurance program for graduate students. **Eligible students are automatically enrolled in UC SHIP, and the premium for this insurance is assessed each term on the graduate student's registration fee statement.** You may request to [waive out](#) of this plan if you can demonstrate comparable and verifiable health coverage that meets the campus' minimum standards for insurance.

UC SHIP is a comprehensive health plan that provides medical, mental health, pharmacy, vision and dental coverage. It features year-round, world-wide coverage using the Anthem Blue Cross PPO network. UC SHIP provides optimal coverage for services on campus and in the UC Irvine community and peace of mind for both parents and students.

For UC SHIP members, the Student Health Center (SHC) is their primary care provider. Primary care providers and specialists at the Student Health Center will administer treatment and/or, if necessary, they will generate a referral for the student to receive additional services in the community or be seen by a specialist in the community if those services are not offered at SHC. Please note that, under the terms of the UC SHIP plan, students must first obtain a referral authorization from a Student Health Center primary care provider BEFORE seeking treatment from a non-SHC provider in the community. If a referral authorization is not obtained in advance, then the claim will be denied. Exceptions to the referral requirement are listed below in the section entitled "[How To Use SHIP](#)".

Your insurance is in effect as of the first day of fall quarter, providing your fees have been paid and you are enrolled. Insurance premiums are paid in Fall, Winter and Spring quarters only. Paying fees and enrolling in Spring quarter will extend insurance through Summer until the beginning of the subsequent academic year.

Accidents

We always hope that no one will be hurt when they are working or teaching, but accidents do happen. All employees are covered under Workers' Compensation Insurance for injuries and/or illnesses that arise out of or in the course of their employment. If your injury or illness requires medical attention, please go immediately to Student Health Services. If that unit is not open, assistance can be sought from any hospital or emergency unit. Whether or not you seek medical assistance, an accident report form must be completed within 24 hours. Please see the Personnel Analyst, in 2205 McGaugh Hall office for these forms.

Emergency Preparedness

<https://www.ehs.uci.edu/>

UCI endeavors to protect employees and students, to minimize program interruption, and to reduce property damage during disaster. An Emergency Operations Center (EOC) has been established and will be activated as the central command center for managing a campus emergency or disaster. Every building has a "Building Coordinator" and each floor of each building has a "Floor Warden." In a disaster, Floor Wardens will assist in evacuation and report damage to Building Coordinators, who in turn, coordinate efforts with "Zone Captains". In a disaster response situation, Zone Captains provide the prime linkage between each campus zone and the EOC. To find out who your disaster response team is, contact your lab advisor or e-mail your request to prepared@uci.edu.

Advance planning is your best protection and your responsibility; forethought and preparation prevent panic. Use the following guide to develop your own personal disaster plan if you have not already done so.

At Work

- Know who the Floor Warden and Building Coordinator are and what they expect of you in a disaster.
- During an earthquake, get under a desk or table.
- When safe, evacuate the building. If you detect the odor of gas or any other unusual odors, do not use matches or candles. Open windows, shut off power, and leave the building immediately. Do not use elevators, use the stairs.
- Move cautiously and observe surrounding hazards.
- Assist the disabled.
- Assemble at your pre-determined meeting point.
- Report any problems to your Floor Warden or Building Coordinator.
- Tune in to local radio stations for information and reports.

Emergency Supplies

The following supplies need to be assembled and packed so that they can be quickly taken when exiting the building.

- A three-day supply of un-spoilable food and water
- A first-aid kit that includes your prescription medications
- Emergency tools, including a battery-powered radio, flashlight, gloves and extra batteries
- Sanitation supplies

In Laboratories

- Secure items that could present a hazard during an earthquake, such as heavy equipment, furnishings, chemicals, and gas cylinders.
- A two-chain securing device (either welded links or straps) must secure gas cylinders at all times. Experience shows that the force of moving gas cylinders can easily snap a single twisted chain or strap.
- Make sure all chemicals are stored properly on shelves equipped with seismic restraining cords or in cabinets with positive latching doors. "Bungee" cords stretched across the front of chemical shelves are an effective means of restraining bottles.
- Separate acids and bases to an extent that will reduce the likelihood of their mixing if spillage occurs in a seismic event.
- Move heavy overhead storage to a lower level.
- Secure experimental apparatus firmly to racks or other stabilized hardware.
- As TV coverage of the Kobe earthquake revealed, fire can contribute to as much loss of life and property as ground-motion. The above measures pertaining to chemical storage and gas cylinders can markedly reduce the risk of fire or explosion. In addition, make it a safety practice to affix sources of open-flames against seismic tip over. (Building Coordinators can provide advice and assistance in this regard.)
- Know the location of emergency exits, fire alarms, and fire extinguishers. Hold meetings periodically with your Floor Wardens, Building Coordinators, and Zone Captains to discuss emergency procedures and the course of action during emergencies.

Other Sources of Information

- The UCI Environmental Health & Safety Office coordinates campus training programs for disaster preparedness (<http://www.ehs.uci.edu/>).
- The UCI Emergency Preparedness website at http://www.police.uci.edu/em/UCI_EmerProc.pdf is also a warehouse of information.

School of Biological Sciences & UCI Academic Policies

STATEMENT OF SCHOOL OF BIOLOGICAL SCIENCES POLICY FOR TA APPOINTMENTS

The School policy is that an exception to the 3.1 GPA criterion may be requested for a student that is in good academic standing and has a GPA greater than 3.0. Exceptions for students with a G.P.A. of less than 3.0 or are otherwise not in good academic standing are not recommended and will not be approved within the School. A letter of exception is a formal statement that the department considers the student to be in good standing and is eligible to serve as a TA. If the School finds itself in a position to request that the student be dismissed from the graduate program, the credibility of the dismissal case has been weakened with a statement from the school that the student is in good standing. All requests for an exception to the GPA policy must be approved by Associate Dean Mulligan, prior to submission to Graduate Division for consideration. Exceptions may only be approved by Graduate Division.

TA Appointment

For appointment as a Teaching Assistant, graduate students must be enrolled in a full-time program of study and making satisfactory academic progress. No student is permitted to begin an appointment who has not met all of the applicable academic criteria as listed below.

For new and continuing graduate students:

- 1) Enrollment in at least 12 units during the current quarter (i.e., the academic quarter in which the teaching appointment occurs).
- 2) Combined campus-wide employment of 50 percent time (220 hours of assigned workload) or less during any academic quarter.

For continuing graduate students:

- 3) During each of the three most recent quarters of enrollment:
 - Completion of 8 units or more of upper division or graduate level credit courses.
 - A letter grade of C, S, or above in all courses completed.
 - No more than two incomplete (I) grades except where stricter school policies apply, as indicated

below:

- A cumulative GPA of 3.1 or higher in those courses where a letter grade (A through F) was received.

STATEMENT OF SCHOOL OF BIOLOGICAL SCIENCES POLICY FOR GSR APPOINTMENTS

The School policy is that an exception to the 3.0 GPA criterion or other academic probation may be requested for a student for one quarter. A student is expected to remove any academic deficiency during the subsequent academic quarter. If the deficiency requires re-taking a class that is only offered once per year, the thesis advisor is expected to submit a letter stating that the student is making satisfactory academic progress. All requests for an exception to the GPA policy must be approved by Associate Dean Mulligan, prior to submission to Graduate Division for consideration. Exceptions may only be approved by Graduate Division. GSR Appointment

Appointment as a Graduate Student Researcher (GSR) or Graduate Student Associate Researcher (GSAR) in combination with other campus-wide employment may not exceed 50% time during any academic quarter. Between academic year sessions (quarters) and during the summer recess, appointments may not exceed 100% time. No student is permitted to begin an appointment who has not met all of the applicable academic criteria as listed below.

For new and continuing graduate students:

- 1) Satisfactory academic progress toward the degree objective.
- 2) Enrollment in at least 12 units during the current quarter.
- 3) Combined campus-wide employment of no more than 50 percent time (220 hours of assigned workload) or less during any academic quarter.
- 4) During each of the three most recent quarters of enrollment:
 - Completion of 8 units or more of upper division or graduate level credit courses.
 - A letter grade of C, S, or above in all courses completed.
 - No more than two incomplete (I) grades except where stricter school policies apply, as indicated below:
 - A cumulative GPA of 3.0 or higher in those courses where a letter grade (A through F) was received.

School and Campus Reporting Requirements

Every Year:

Annual faculty committee/Thesis committee meeting

Year 3:

Advancement to Candidacy Exam (PhD Form I)

Year 5 (6/7)

Pre-defense and Thesis Defense (PhD form II)

Caution: The maximum time to degree is 7 years or 21 quarters.

UNIVERSITY OF CALIFORNIA, IRVINE
DEPARTMENT OF NEUROBIOLOGY & BEHAVIOR
2205 MCGAUGH HALL
IRVINE, CA 92697-4550
Phone: (949) 824-8519
Fax: (949) 824-2447
<http://neurobiology.uci.edu>

UCI - NEUROBIOLOGY & BEHAVIOR GADUATE
PROGRAM

**CORE CURRICULUM AND LEARNING
OBJECTIVES**

2017-18

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Molecular Neuroscience, Fall 2017

(Neurobio N206)

Instructors: Dr. Mathew Blurton-Jones, 3014 Gross Hall, 4-5243, mblurton@uci.edu
 Dr. John F. Guzowski, 108 Bonney Research Lab., john.g@uci.edu
 Dr. Karina Cramer, 2215 McGaugh Hall, cramer@uci.edu

Class times: 10:30 AM - 12:00 PM, M, W, F - 2246 McGaugh Hall

<u>Date:</u>	<u>Topics:</u>	<u>Instructor:</u>
Sept	9 F Introduction	Blurton-Jones
Oct	2 M Manipulating gene expression in the CNS-I	Blurton-Jones
	4 W Manipulating gene expression in the CNS-II	Blurton-Jones
	6 F <i>Discussion</i>	Blurton-Jones
	9 M Disease Mechanism: Neurologic Disorders	Blurton-Jones
	11 W Protein-protein interactions/Proteomics	Blurton-Jones
	13 F Cell trafficking	Blurton-Jones
	16 M <i>Discussion</i>	Blurton-Jones
	18 W Exam I	Blurton-Jones
	20 F Neuronal Signaling, Gene Expression, & Synaptic Plasticity	Guzowski
	23 M Dendritic spines, Structure & Signal transduction / Integration	Guzowski
	25 W Mechanisms of synaptic activity-regulated gene transcription	Guzowski
	27 F Epigenetic regulation of neuronal gene expression	Guzowski
Nov	30 M <i>Discussion #1</i> – Group presentation of primary research papers	Guzowski
	1 W Post-translational regulation of synaptic gene expression	Guzowski
	3 F Molecular mechanisms of synaptic plasticity and homeostatic scaling	Guzowski
	6 M Connecting molecular mechanisms of plasticity to memory & addiction	Guzowski
	8 W <i>Discussion #2</i> - Group presentation of primary research papers	Guzowski
	10 F <i>NO CLASS: VETERAN'S DAY HOLIDAY</i>	
	13 M Exam 2	
	15 W <i>NO CLASS: SOCIETY FOR NEUROSCIENCE MEETING</i>	
	17 F Introduction: Neural Polarity & Induction	Cramer
	20 M Regionalization	Cramer
	22 W Neurogenesis & Neuronal Migration	Cramer
	24 F <i>Discussion #1</i> – Early brain development – paper discussion	
	27 M Neuronal Fate Specification	Cramer
	29 W Axon Guidance	Cramer
Dec	1 F Synaptogenesis and Synaptic Pruning	Cramer
	4 M Programmed Cell Death	Cramer
	6 W <i>Discussion #2</i> – Neuronal Fate/circuit development – research articles	Cramer
	8 F Exam 3 (10:30-12:30)	Cramer

NB 206—Molecular Neuroscience Learning Goals and Outcomes

Dr. Mat Blurton-Jones

Introduction: DNA-RNA-Proteins

Learning Goal: Students will learn about the relationship between DNA, RNA, and proteins and how the transcription and translation proceed. They will also begin to learn about basic DNA cloning methods.

Learning Outcomes:

- Understand how DNA can change over time: Intragenic mutation, gene duplication, DNA segment shuffling, horizontal transfer.
- Understand DNA base pairing and predict a complementary sequence.
- What happens during the three stages of transcription of DNA into RNA (initiation, extension, termination).
- How does translation begin and proceed to produce polypeptides, what is a reading frame?
- What controls the folding of proteins?
- Understand how posttranslational modifications can affect protein function.
- Understand how we can use plasmid-based cloning to produce useful new experimental tools.

Manipulating gene expression in the CNS-I

Learning Goal: Students will learn about PCR and the practical and experimental aspects of plasmid-based cloning. We'll also discuss methods to deliver genes of interest to cells.

Learning Outcomes:

- Practically speaking how does traditional Plasmid cloning work?
- How does PCR work and why does it require a thermostable polymerase?
- Be familiar with some of the newer more efficient cloning methods that are available.
- How is DNA sequenced, understand the traditional dideoxyribonucleoside method and how easy it is now!
- The class will go through and become familiar with all the steps involved in generating a new plasmid driving a gene of interest by a promoter of interest.
- How can we transfect cells and what is the difference between transient versus stable transfection?

Manipulating gene expression in the CNS-II

Learning Goal: Students will learn how can molecular approaches be used to generate animal models and how regulatable expression can be achieved in mice.

Learning Outcomes:

- How are transgenic mice made?
- How are knockout and knockin mice made (or where until very recently)!
- Why would we need regulatable expression of genes or knockouts in mice?
- How can tet-regulatable and Cre-Lox systems be used to address this need?
- What is optogenetics and how can it be used in mice?

Discussion Section: 2 papers will be introduced and presented by student groups. One will be related to CRISPR the other will be how iPSCs were developed.

Protein-protein interactions/Proteomics

Learning Goal: Students will learn about

Learning Outcomes:

- What do we mean by primary, secondary, tertiary, and quaternary structure of proteins?
- How can we detect specific proteins? How are antibodies made and what is the difference between polyclonal and monoclonal antibodies?
- What is immunohistochemistry and how does it work?
- How do Western blots and 2D gel electrophoresis/mass spec work?
- How can we examine protein protein interactions? Co-IP, yeast-2 hybrid, FRET.

Cell trafficking

Learning Outcomes:

- Review the key cellular organelles.
- What do signal sequences in peptides do?
- What is gated transport, where does it occur in the cell and how is it regulated?
- What is transmembrane transport, where does it occur in the cell and how is it regulated?
- What is vesicular transport, where does it occur in the cell and how is it regulated?
- How are unwanted or misfolded proteins and larger aggregates degraded by the cell?

Disease Mechanism: Neurologic Disorders

Learning Goal: Students will learn about how molecular tools can be used to study Alzheimer's, Parkinson's disease, and ALS.

Learning Outcomes:

- What are AD, PD, and ALS? Basic understanding of symptoms, genetics, and pathology.
- Why have treatments for AD failed thus far? Why does L-DOPA often lose efficacy with time?
- How can scientists model these disorders? Examples of both transgenic and iPSC modeling will be discussed.
- What are the commonalities between these disorders and how might lessons from one disease aid research in another?
- Review and discussion of a previous midterm

Discussion Section: 2 papers will be presented by student groups.

One will be related to studying protein-protein interactions and the other will be related to new RNA/Protein technologies such as PaperClip, TRAP, iDISCO/clearing, optogenetics.

Dr. John F. Guzowski

Overview of the section: In this section, we will discuss molecular mechanisms that neurons use to modify synaptic connections in the adult brain in an activity-dependent manner, which provide the bases for adaptive behaviors in the adult animal.

Lecture 1. Neuronal signaling, gene expression, & synaptic plasticity: Current questions and approaches

Learning Goal: To identify the specific cell biological challenges faced in understanding how neurons of adult animals can rapidly modify synaptic connections in an input specific fashion

Learning Outcomes:

- Identify different mechanisms of synaptic and neural plasticity
- Explain the fundamental concepts of synaptic plasticity as a means for adaptive behavior in animals
- Describe the dual challenges of “synapse to nucleus” and “nucleus to synapse” for molecular regulation of synaptic plasticity

Lecture 2. Dendritic spines: Structure and signal transduction / integration

Learning Goal: To gain a fundamental understanding of how the protein-protein interactions in dendrites facilitate the conversion of extracellular signals to changes in dendritic structure and function

Learning Outcomes:

- Understand how dendritic spines compartmentalize proteins to allow precise signaling
- Discuss how diverse extracellular signals (including neurotransmitters, neuropeptides, growth factors, etc.) transmit information to the postsynaptic neuron
- Describe how scaffold proteins facilitate protein-protein interactions to optimize communication between neurotransmitter receptors and intracellular signaling complexes

Lecture 3. Mechanisms of synaptic activity-regulated gene transcription

Learning Goal: To gain understanding of how neurons can convert changes in synaptic and spiking activity to regulated changes in transcription of gene required for establishing long-lasting synaptic changes

Learning Outcomes:

- Distinguish distinct mechanisms that convert alterations of synaptic activity and neural firing to changes in neuronal gene transcription
- Describe the distinct control points that allow neurons refined and precise regulation of transcription to extracellular signals
- Identify transcription factors and regulatory mechanisms that convert increases in intranuclear Ca²⁺ to rapid transcriptional upregulation of immediate-early gene mRNAs

Lecture 4. Epigenetic regulation of neuronal gene expression

Learning Goal: To understand the different mechanisms that promote, facilitate, and refine patterns of neuronal gene expression necessary for plasticity

Learning Outcomes:

- Describe how alterations of histone proteins modulates transcriptional processes
- Describe how activity-dependent changes in DNA and RNA methylation regulates gene expression
- Understand the role of long noncoding RNAs in regulating transcription

Discussion 1: Group presentations of primary research papers covering lectures 1-4

Learning Goal: To gain experience reading and understanding peer-reviewed original research in the field of molecular neurobiology

Learning Outcomes:

- Explain the rationale for the study described in the paper
- Understand the experimental methods and research strategy
- Describe the results of the experiments
- Interpret the results of the study and identify the new contribution to the field

Lecture 5: Post-transcriptional regulation of synaptic gene expression: mRNA trafficking, microRNA, and local translation

Learning Goal: To understand the cellular mechanisms that provide neurons the means for precise spatio-temporal regulation of protein expression

Learning Outcomes:

- Describe how RNA-protein interactions in the nucleus allow dendritic targeting of specific mRNAs
- Describe how microRNAs provide refined regulation of specific mRNAs at synapses
- Understand how synaptic activity and intracellular signaling pathways activate local translational machinery
- Describe how splicing structural of specific mRNAs predestines these mRNAs for rapid translation-dependent degradation via nonsense mediated decay machinery

Lecture 6: Molecular mechanisms of synaptic plasticity and homeostatic scaling

Learning Goal: To gain familiarity with key molecular mechanisms underlying long-term synaptic plasticity and homeostatic synaptic scaling, two processes critical for information storage in neuronal networks

Learning Outcomes:

- Describe the temporal biochemical changes allowing spine growth and AMPA receptor insertion in long-term potentiation
- Describe the concept of “synaptic tagging” which allows targeting of new mRNAs and proteins to synapses undergoing long-term potentiation
- Understand the need for homeostatic synaptic scaling, as a means to prevent runaway excitation
- Describe an activity-dependent mechanism of glutamatergic synaptic scaling

Lecture 7. Connecting molecular mechanisms of plasticity to memory & addiction: Approaches & challenges

Learning Goal: To understand how neuroscientists have sought to link experimental forms of synaptic plasticity to memory and addiction in the intact, behaving animal

Learning Outcomes:

- Describe basic transgenic and vector-based approaches used to test key elements of the hypothesis that synaptic plasticity underlies adaptive behaviors
- Become familiar with key experimental findings that have supported the above hypothesis
- Identify limits of our current understanding, and describe potential approaches to overcome these limitations

Discussion 2: Group presentations of primary research papers covering lectures 5-7

Learning Goal: To gain experience reading and understanding peer-reviewed original research in the field of molecular neurobiology

Learning Outcomes:

- Explain the rationale for the study described in the paper
- Understand the experimental methods and research strategy
- Describe the results of the experiments
- Interpret the results of the study and identify the new contribution to the field

Dr. Karina S. Cramer

Lecture 1: Introduction; Neural Polarity and Induction

Learning Goal: To understand the central problems in developmental neurobiology and to understand how the nervous system emerges during embryogenesis

Learning Outcomes:

- Become familiar with the model organisms and strategies for studying development
- Become familiar with gastrulation and identify the origins of three germ layers
- Describe neurulation
- Understand the Spemann-Mangold experiments and neural induction
- Identify the function of BMP signaling in induction
- Learn how Notch and Delta interact to regulate neural cell fate

Lecture 2: Regionalization

Learning Goal: To understand how the body plan is specified in early embryonic development.

Learning Outcomes:

- Understand maternal factors that influence polarity
- Describe segmentation in vertebrates and invertebrates
- Describe the expression and function of homeotic selector genes in segment identity
- Identify factors that promote regionalization in the forebrain
- Identify factors that regulate dorsoventral patterning

Lecture 3: Neurogenesis and Neuronal Migration

Learning Goal: To understand how the nervous system produces the right numbers of neurons and glia and how these cells get to the right part of the nervous system.

Learning Outcomes:

- Explain the factors that regulate cell number
- Identify the role of the ventricular zone in the cell cycle
- Neurogenesis and histogenesis in the cerebral cortex: understand the formation of layers, neurons, and glia
- Understand the connection between migration route and fate of neural crest cells
- Identify disorders related to defective neural crest cell migration
- Identify the source and tangential migratory pathway of inhibitory neurons
- Identify sites of adult neurogenesis and migration

Discussion 1: Early brain development – paper discussion

Learning Goal: To gain experience reading and understanding peer-reviewed original research in the field of developmental neurobiology.

Learning Outcomes:

- Explain the rationale for the study described in the paper
- Understand the experimental methods and research strategy
- Describe the results of the experiments
- Interpret the results of the study and identify the new contribution to the field

Lecture 4: Neuronal Fate Specification

Learning Goal: To understand the factors that determine cell type in the developing nervous system.

Learning Outcomes:

- Review experimental strategies for determining whether cells or tissues are committed
- Understand mosaic versus regulatory development
- Understand how networks of transcription factors contribute to cell fate specification
- Describe the functions of morphogens and transcription factors that contribute to specification of ommatidia in *drosophila* and the vertebrate retina
- Identify factors that contribute to fate specification in the spinal cord and peripheral nervous system
- Understand the role of timing, as in the competence of cortical cells to contribute to distinct layers at different times

Lecture 5: Axon Guidance

Learning Goal: To become familiar with axonal growth cones and the molecular influences that regulate their growth.

Learning Outcomes:

- Be familiar with growth cone structure
- Identify the major classes of axon guidance molecules
- Describe chemoattractive and chemorepulsive mechanisms

Lecture 6: Synaptogenesis and synaptic pruning

Learning Goal: To understand the factors that promote formation of synapses and subsequent elimination of excess synapses.

Learning Outcomes:

- Understand the molecular mechanisms required for assembling synapses
- Identify molecules needed to cluster receptors
- Understand the role of activity in synaptogenesis

- Describe the role of activity in synapse pruning
- Describe the function of glial cells in synapse pruning

Lecture 7: Programmed Cell Death

Learning Goal: To understand the regulation and cellular mechanisms underlying developmental apoptosis, or programmed cell death

Learning Outcomes:

- Distinguish between apoptosis and necrosis
- Understand the role of neurotrophic factors and the key experiments that demonstrated these roles
- Become familiar with signaling pathways that promote cell survival or cell death
- Describe the importance of afferent input for cell survival
- Identify examples of cell death and sexual dimorphism

Discussion 2: Neuronal cell fate/circuit development – discussion of research articles

Learning Goal: To gain experience reading and understanding peer-reviewed original research in the field of developmental neurobiology.

Learning Outcomes:

- Explain the rationale for the study described in the paper
- Understand the experimental methods and research strategy
- Describe the results of the experiments
- Interpret the results of the study and identify the new contribution to the field

University of California, Irvine
Department of Neurobiology & Behavior

**NOTICE OF INTENT TO CHANGE
LABORATORY ASSIGNMENT**

Please notify the Neurobiology & Behavior Department Office of your intent to change labs by submitting this form to the Student Affairs Officer in MH 2205. You must collect signatures from your current advisor, your new advisor, and the graduate advisor in order for the lab assignment to be authorized.

Graduate Student Name: _____ Date Lab Change Will Be Effective: _____

By submitting this form I intend to change my laboratory assignment.

Student Signature: _____

As the current advisor, I understand that the graduate student named above will relinquish their assignment in my laboratory.

Current Advisor Name: _____ Signature: _____

As the new advisor, I accept the above named graduate student into my laboratory effective on the date specified above. This includes financial responsibilities, if any.

New Advisor Name: _____ Signature: _____

I hereby approve the above named graduate student's request to change their laboratory assignment.

Graduate Advisor Approval Signature: _____

Policy on Annual Graduate Student Advising

Pre-Advancement

A faculty committee that includes the student's advisor and at least two other departmental faculty members will meet annually with each graduate student at the end of the first year. Other faculty, who need not be members of the department, can be included on an *ad hoc* basis in addition to the three department faculty. The purpose of the pre-advancement meetings is to make sure that the student is aware of, and is meeting, degree requirements and expectations in a timely fashion. Note that the purpose of these meetings is NOT to evaluate the student's research or progress towards identifying a research topic, although such issues can be discussed. In addition, these meetings provide the opportunity to advise students on research opportunities, professional development, and scholarship and fellowship opportunities. A meeting report will be added to the student's academic file after each meeting.

Advancement to Candidacy

Graduate students are expected to advance by the end of the third year. The Advancement committee may or may not include the same faculty as the Pre-Advancement committee (contact the Graduate Advisor for details on the Advancement committee).

Post-Advancement

Students are expected to meet at least once each year with a thesis committee consisting of their advisor and at least two other department faculty members. At each meeting, the student and the committee will discuss recent progress, remaining objectives, and a timetable for completion of the doctoral thesis. A meeting report will be added to the student's academic file after each meeting.

The standardized School form (below) may be modified by individual departments to suit their needs; however, forms must include all of the information on the standard form.

GRADUATE STUDENT ADVISING -ANNUAL COMMITTEE MEETING REPORT

NAME: _____ TODAY'S DATE: _____

Quarter and year student entered graduate school: _____ Expected date of advancement to candidacy: _____

Quarter and year student entered NB&B graduate program: _____

Expected quarter & year of thesis defense: F W S S _____ Date of previous committee meeting: _____

INP Student: Yes____ No____

MSTP Student: Yes____ No____

Student has completed Core satisfactory: Yes____ No____ MSTP student has completed 209 course: Yes____ No____

THESIS ADVISOR COMMENTS:

COMMITTEE MEMBER COMMENTS:

STUDENT COMMENTS & SIGNATURE:

Student Signature: _____

COMMITTEE MEMBER SIGNATURES:

Name: _____ Signature: _____ Satisfactory Progress?: _____

Name: _____ Signature: _____ Satisfactory Progress?: _____

Name: _____ Signature: _____ Satisfactory Progress?: _____