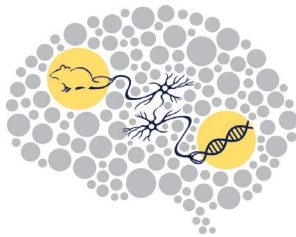


DEPARTMENT OF NEUROBIOLOGY & BEHAVIOR

University of California, Irvine



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

Graduate Student Handbook 2020-2021

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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.
Graduate Student Advisor Dr. Stephen Mahler 1203 McGaugh Hall (949) 824-6128 mahlers@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: Scott Kilianski skilians@uci.edu Abigail Flores abigaivf@uci.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

Sally Dabiri Department Administrator (949) 824-4727 sfdabiri@uci.edu	Department operations management; faculty recruitment, merits and promotions and sabbatical leaves; Graduate student support; General operating budget; Lecturer recruitment and appointment
Margaret Davis Purchasing Analyst (949) 824-4719 brian@uci.edu	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.
Lin Xi Senior Finance Analyst (949) 824-5251 lxix@uci.edu	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.
Naima Louridi Administrative Analyst (949) 824-8519 nlouridi@uci.edu	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.
Eleanor Chan Senior Finance Analyst Supervisor (949) 824-2395 echan@uci.edu	Assistant to manager. Contract and grant accounting; processing of accounting forms including purchase orders; reconciliation of ledgers; preparation of reports.

Other Staff You Should Know

Name	Title	Phone
Dr. Christie Fowler cdfowler@uci.edu	INP Director	4-8363
Gary Roman gary.roman@uci.edu	INP administrator	4-6226
Lisa Grigaitis lgrigait@uci.edu	Assistant to Dean LaFerla	4-5315

Faculty E-Mail

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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
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/Printing 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	1332 BS3	4-6141
Benedicte Shipley	Assistant Dean	5120 NSII	4-5558
Kristin Caplin	Personnel Director	4125 NSII	4-5467
Rhoda Peng	Director of Finance	4135 NSII	4-6036

Robyn Stiffler	Facilities Director	2136 NS I	4-8284
Matthew Martinez	Computer Resource Manager	2115 NS I	4-8832
Jenna Bague-Sampson	Director, Bio Sci Student Affairs	1328 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 through a different gateway program, or directly in the first year. 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 (B or better), 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 208: 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 partly 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 - either Winter or Spring: 50% TA: teaching N113L at 25% and grading N113L at 25%.

In addition to N113L (as described above), students must also TA an additional quarter at 50% (or two quarters at 25%) before they can graduate (as per School policy). The department currently has ~30 slots each year for assisting with N113L 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.

Students may TA beyond the required amount if they are interested in gaining additional experience or funds (not to exceed stipend level).

Related information:

- a. Students on most federal fellowships or training grants may not receive TA appointments greater than 25%. In these cases, students can TA 25% for N113L in both Winter and Spring to fulfill their departmental requirement.
- 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

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. *One of these classes must be in the area of statistics and experimental design.* This requirement can be met by taking NB257 (Statistics and Experimental Design) or, with the approval of the graduate advisor, an equivalent statistics class offered by another department. Advanced classes must be taken for a letter grade, not on an S/U basis, to count toward the required minimum of four advanced classes. 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 should begin taking advanced courses in their second year and are strongly encouraged to enroll in NB257 or equivalent statistics class in their second year.

Students are expected to maintain a GPA of 3.3 or higher throughout their time in the graduate program.

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. Although it is good to have preliminary data to include, this is not a strict requirement. 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.

Students are expected to 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 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, annual thesis committee meetings should directly assess and provide guidance for academic publication.

Outside Employment and Conflict of Interest

Doctoral students are expected to be fully engaged in the doctoral program and should not undertake outside employment. An exception may be granted for outside employment that provides a professional development opportunity, typically related to teaching. Requests for exception should be directed to the Associate Dean for Graduate Studies.

The campus has an established conflict of interest (COI) policy that must be met when a graduate student performs research, and the PI has a financial interest in the project. If there is a COI, there must be an additional committee member appointed to the thesis committee that is responsible for protecting the student from conflicts. This process is detailed in Ph.D. form I. The Graduate Dean shall select the Oversight Member from a list of three nominees agreed upon by the student, the faculty research/thesis advisor, and the departmental representative. The departmental representative shall submit a written request to appoint an Oversight Member to the Graduate Dean no less than two weeks prior to the date of the exam to allow a reasonable time for review. This request should include background information describing the circumstances of the possible conflict. The Graduate Dean will retain sole authority to appoint the Oversight Member.

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 their 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.

Counseling Center

<https://counseling.uci.edu/services/>

The counseling Center is the primary counseling and mental health agency for UC Irvine graduate students. They strive to assist students with their academic success by developing dimensions of well-being.

Disability Services Center (DSC)

<https://dsc.uci.edu/>

At the University of California, Irvine, providing a culture of inclusion and equal opportunity for students with disabilities is a campus wide responsibility and commitment. UCI demonstrates its core values of individual growth, development, civility, and diversity by recognizing students with disabilities as an important part of its student body. Our mission is to empower students to maximize their abilities to thrive in today's global community. New to DSC? Registering is the first step towards getting accommodation services at UCI. <https://dsc.uci.edu/register/>

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

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.

Graduate students are eligible to register for the free sustainable transportation program. Register at <https://www.parking.uci.edu/AT/>.

A good way to avoid parking costs is to ride the OCTA bus. University Pass allows students at UC Irvine to ride OC bus all day, every day for a fraction of the most compared to regular fare. <https://parking.uci.edu/AT/modes/OCTA.cfm>

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.

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 listserve 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 listserve:

- 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 5 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. Connexxus is a UCI preferred method for making travel arrangements. Any UCI employee who needs assistance accessing Connexxus may send an email at askconnexxus@uci.edu
https://portal.uci.edu/uPortal/f/u3011s6/p/webproxy-cms-file-view.u3011n140/max/render.uP?pP_cmsUri=public%2FAccounting%2FTravel%2FHowToUseConnexxus.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

Graduate Student stipends can be paid via check or direct deposit. Checks will be sent to your home address. 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 “UCpath” at the following link: <https://ucpath.uci.edu/>. 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 Christine Lazok-Torres clazok@uci.edu. Reimbursement checks for entertainment, travel expenses, supplies, etc., will also be direct deposited.

Each of you received an email 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 stipend 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 Christine Lazok-Torres clazok@uci.edu and Naima Louridi nlouridi@uci.edu located at 2205 McGaugh Hall office for these forms.

Emergency Preparedness

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

University of California, Irvine strives to ensure the UCI community is prepared to respond to and recover from any emergency or disaster event impacting our campus, and to ensure the safety and sustainment of our students, staff, faculty and visitors, as well to maintain the continuity of critical research and academics and reduce property damage during disasters.

UCI has established an Emergency Operations Center (EOC) that will be activated during a campus emergency or disaster as the central command center for emergency management. Additionally, a UCI Zone Crew, comprised of volunteer staff and faculty across campus, will assist in facilitating evacuation and shelter/secure in place orders in an emergency. 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 visit the zone crew website <https://police.uci.edu/emergency-mgmt/zone-crew.php> for more information.

Advance planning is your best protection and your responsibility; forethought and preparation prevent panic. Please get to know the plans and procedures for your location on the UCI campus and remain safe at all times. To view a short overview video about emergency preparedness on the UCI campus, please click here https://www.youtube.com/watch?v=oVRBM2ak7SM&feature=emb_title.

IMPORTANT PHONE NUMBERS

UCI Police Department 9-1-1 on campus (non-emergency 949-824-5223)

Environmental Health & Safety 949-824-6200 safety@uci.edu

Facilities Management 949-824-5444 fmavc@uci.edu

Newport Urgent Care 949-752-6300

Student Health Center (First-Aid Only) 949-824-5304

At Work

- Know who the Floor Warden and Building Coordinator are and what they expect of you in a disaster.
- During an earthquake, move to a clear area (if safe to do so). Avoid falling hazards. If inside, drop down to the floor and take cover under a desk or table. Protect your head and neck with your arms.
- When safe, evacuate the building. If you detect the odor of gas or any other unusual odors, do not use matches or candles. Do not use elevators, unless directed to do so. Use the stairs as available.
- Move cautiously and observe surrounding hazards.

- Assist the disabled if willing and able.
- Assemble at your pre-determined meeting point.
- Report any problems to your Floor Warden or Building Coordinator.
- Sign up for zotALERT <https://www.oit.uci.edu/zotalert/> or tune in to local radio stations for information and reports.
- Know your assembly area based on your location on campus <https://services.ehs.uci.edu/em/zonemap.html>

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 (replace expired materials as needed) that includes your prescription medications
- Emergency tools, including a battery-powered radio, flashlight, gloves and extra batteries
- Sanitation supplies

In Laboratories

- Ensure all UCLC <https://uclc.uci.edu> training has been completed.
- Know the location of emergency exits, eyewash and safety showers, fire alarms, and fire extinguishers.
- Securely anchor items that could present a hazard during an earthquake, such as heavy equipment, furnishings, chemicals, and gas cylinders. Contact your school coordinator or facilities for more information.
- A two-chain securing device (i.e. chains at the top and bottom 1/3 portions) 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. Anchor to a permanent building wall or fixture.
- Make sure all chemicals are stored properly on shelves equipped with lips or seismic restraining brackets, cords or in cabinets with positive latching doors. "Bungee" cords stretched across the front of chemical shelves are an effective means of restraining bottles that do not have lips.
- Separate acids (inorganic vs organic) 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 below eyesight. Leave an 18" ceiling clearance when stacking boxes/materials.
- Store liquid flammables in flammables cabinets and away from ignition sources (combustibles, oxidizers, heat etc.)
- Secure experimental apparatus firmly to racks or other stabilized hardware.
- 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.)
- During floods, stay away from electrical sources, cover essential equipment if able with plastic tarps, do not go back into a flooded area due to risk of electric shock, slipping/tripping, or having items fall on you.
- 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/>).
- UCI Emergency Preparedness Procedures <https://www.police.uci.edu/emergency-mgmt/>
- UCI Medical Treatment Form https://www.ehs.uci.edu/research-safety/occupational-health/_pdf/med-emergency-poster.pdf

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. Completion of IDP.

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.

NEUROBIOLOGY & BEHAVIOR GRADUATE PROGRAM

Communicating with your graduate mentor

Although most graduate students complete their research under the supervision of a mentor without significant misunderstandings or disputes, serious disagreements can arise if you and your advisor do not effectively communicate. There are several strategies to use to proactively ensure that you and your advisor have well-defined and consistent expectations for graduate work. While individual student-mentor styles vary, here is some information that you should keep in mind to minimize misunderstandings. A good rule of thumb is that the more transparent and organized you are, the less likely you are to encounter misunderstandings with your mentor.

1. Time away from lab: Keep in mind that your role as a graduate student encompasses both paid employment (for 40 hours as a research assistant and/or teaching assistant *and* scholarship (work at the bench, journal clubs, seminars, data analysis, writing papers). These roles intersect but are not always completely overlapping: *your scholarship is expected to extend beyond the effort of your employment.*

Your graduate stipend is payment for *employment* as a teaching assistant or researcher. Just as you couldn't miss a shift at Starbucks, you must demonstrate that you are working on research and teaching for the hours that you are paid. For example, a 50% TA assignment means that you can have a reasonable expectation of spending ~20 hours a week on these duties and spend the remainder of your time doing research. During the week and working hours, it is a good idea to make certain that your advisor and lab-mates know where you are if you are away from the lab because of illness, teaching or seminars.

The UC academic personnel manual rules stipulate that graduate students do not accrue vacation time or sick leave during intervals when the university pays them. Work with your advisor and the class instructors for reasonable accommodations.

- **Serious illness:** If you are ill and can't complete your TA assignment, you must arrange with the class instructor and other class TAs so that the work is covered. It's also important to repay any time served by another TA by subbing for that TA later in the quarter so the net

hours for you and the other TA balance out. For students employed as RAs, you should make certain that one of your lab-mates stabilizes any on-going samples and make up lost time once you are recovered.

- **Scientific Meetings:** If you are supported by a TA-ship, you must not miss lectures or exams for scientific meetings or other academic travel without the express permission of the course instructor. Given that your stipend is provided by your employment as a TA, you should not expect that the instructor can always organize an accommodation for your proposed absence. If you are teaching a lab or discussion section that can potentially be traded with other class TAs, you can attempt to organize this with the other TAs. Make certain that the course instructor knows of your plans and approves of them before you organize your travel to a meeting.
- **Vacation time:** Many graduate students begin their careers by thinking of all academic term breaks as “vacation” because this was true during their undergraduate years. As a graduate student and employee, this is no longer the case. The university is closed for a long holiday in December; other university holidays occur throughout the year and are listed on the registrar’s calendar. On these days, UC offices are closed. All other times when the university is open, you are expected to be at work. Any time off at these times must be negotiated with your advisor on a case-by-case basis.

2. Weekly updates on research progress:

It is often helpful for you to take some time to briefly record the following information at the beginning of each week in a 1-2 page document.

What did you do last week?

[I did a western blot on cell lysates from kinase inhibitor-treated and control samples, stained other samples for flow cytometry and digested 20 minipreps to identify three plasmids which had my insert in the correct orientation.]

What worked and what is your conclusion from these data?

[My western blot data indicates that treatment with the kinase inhibitor does not reduce protein phosphorylation, although I would like to repeat this experiment.]

What didn’t work and what will you try next?

[My antibody staining didn’t work; my positive control was negative so I will try a longer incubation with a fresh set of samples to make certain that the antibody works.]

What papers have you read and what interesting information have you learned?

This weekly document is distinct from your detailed research notebook and provided an on-going narrative and summary of your efforts each week. You may wish to email this document to your advisor or print it out for a weekly one-on-one meeting. By filing these weekly reports in sequence, you have a clear record of your research activity over time. This is useful for gathering data for writing papers or deciding with your advisor that an approach or reagent is not going to work as planned.

3. Meetings: It is often the case that students who are having difficulties with their project and/or advisor are reluctant to schedule regular, required meetings with their committee. The meeting should not be put off if you don’t have “enough data” – having problems with the research project and/or communication with your mentor are key reasons to schedule a committee meeting to get a larger group of scientists thinking about your project.

4. Difficulties communicating with your mentor:

You may begin by talking with the NBB graduate advisor (Ian Parker), the Biological Sciences Associate Dean for Graduate Studies (Michael Mulligan) or the Graduate Division counselor (Phong Luong) to plan how to approach resolving your specific problem. Problems that require higher level mediation may involve the assistance of the offices of the Ombudsman and/or OEOD at UC Irvine. The Office of the Ombudsman is a confidential, impartial, informal, and independent resource to talk about concerns, explore options, and make informed decisions to reach equitable and fair resolutions. The UCI Office of Equal Opportunity and Diversity (OEOD) is responsible for compliance with federal and state laws and University policies and procedures regarding discrimination, retaliation, sexual harassment, and sex offenses. OEOD works to promote and integrate the principles of equal opportunity, affirmative action, nondiscrimination, and inclusive excellence at UCI.

Department of Neurobiology & Behavior
School of Biological Sciences
UC Irvine

Plan to Implement Graduate Program Learning Outcomes (PLOs)

I. Program Overview

Neurobiology & Behavior Ph.D. Program

Students pursuing the PhD Degree may enter the department directly, or through the Interdepartmental Neurosciences Program (INP). INP students must complete all gateway program requirements before transferring into the departmental doctoral program, including coursework, rotations, a course in the responsible conduct of research, etc. as required by the INP.

The departmental degree requirements include: (1) required coursework; (2) teaching assistantship; (3) developing and executing a successful thesis research project; (4) meetings with faculty committees, including pre-advancement, advancement, and annual committee meetings; (5) participation in research in progress talks and departmental retreat; (6) preparation and presentation of the dissertation.

1. Required Coursework

In the first year, directly-admitted students, or those entering through the INP with intention to join Neurobiology & Behavior must enroll in the first year core courses: Molecular Neuroscience, Cellular Neuroscience, Cellular Neuroscience Lab, Systems Neuroscience, and Behavioral Neuroscience. These selections meet core requirements for all participating Programs and provide a broad base of knowledge to prepare students for successful contributions in Neuroscience. In surveys the courses have previously been highly rated by students. In conjunction with these courses, students build on core knowledge in the course Foundations in Neuroscience, which highlights ongoing faculty research. Students also take Responsible Conduct of Research, which highlights best ethical practices in all aspects of research.

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.

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. These classes must be taken for a letter grade, not on an S/U basis, to count toward the required minimum of four advanced classes. 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 should begin taking advanced courses in their second year and are strongly encouraged to enroll in NB257 (Statistics and experimental Design) in Fall quarter of their second year or, with the approval of the graduate advisor, in an equivalent statistics class offered by another department. This class counts toward the required minimum of four advanced classes.

Academic Evaluation: 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.

2. Teaching requirement

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 partly 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 - either Winter or Spring: 50% TA: teaching N113L at 25% and grading N113L at 25%.

In addition to N113L (as described above), students must also TA an additional quarter at 50% (or two quarters at 25%) before they can graduate (as per School policy). The department currently has ~30 slots each year for assisting with N113L 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. Students may TA beyond the required amount if they are interested in gaining additional experience.

A 50% TA appointment corresponds to 20 hours per week over the course of the quarter. Typically, students will be required to fulfill their teaching obligations during their second

and third years. Some students, particularly those on training grants, may do 2 quarters of 25% TAing in place of 1 quarter at 50%.

3. Research Rotations and Thesis Research

Students typically join the department at the start of their second year in graduate school, after the first year being in INP, though students may also be directly admitted to N&B. INP students complete three research rotations, and directly-admitted students conduct research in the sponsoring mentor's lab. For INP students, at the start of each rotation, they develop a rotation proposal together with their research advisor. The plan should be focused with clear goals and the research should have an appropriate scope so that it can be completed during the quarter. Students will then write a report at the end of the quarter evaluating the research and the approaches that were used. Rotations provide an opportunity to learn the research methods and analysis used in each laboratory as well as a chance to explore the scientific areas of study. The student will be familiar with the research in each laboratory in order to identify a thesis supervisor. The INP director reviews rotation proposals and reports in order to determine how to improve the quality of research rotations. Additionally, student feedback is solicited to determine how to improve any problems with rotations or with instruction on research methods and analysis.

During a student's second year they will, in conjunction with their advisor, identify an interesting, tractable research problem, which will result in a thesis over the following 3-4 year period. Over the next several years the student, with the help of mentoring from their thesis advisor, will then work towards (1) developing the knowledge, technical, and critical thinking skills necessary to successfully complete the proposed project; (2) gathering and analyzing the data necessary to complete the proposed project; (3) gaining the scientific communication skills that allow them to effectively convey the results of their findings in both oral presentations at informal and formal meetings; and in written documents in the form of abstracts, papers, and grant applications.

4. Advancement to Candidacy

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. Although it is good to have preliminary data to include, this is not a strict requirement. 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.

Students are expected to 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.

5. Meetings with Faculty Committees

Students will meet with faculty committees at many key points in the Ph.D. program. In their first year, they will meet with the INP director and the department graduate advisor. At the start of their second year, they meet informally with a small group of 3-4 faculty to discuss their research project (second year meeting). In their 3rd year, they will form a committee of 5 faculty members that will serve as their Pre-Advancement Committee and as their Advancement to Candidacy Committee.

Yearly Committee Meetings with a student's Thesis Committee are a Department-level requirement. These meetings must be held at least once a year, every year between advancement and graduation. The goal of these meetings is to provide input and feedback on the student's thesis progress and future plans, and to allow them to obtain approval for any proposed changes in direction. Students are required to make an oral presentation (with slides) of their research progress and future plans. After each meeting, the student will provide an Individual Development Plan (IDP), completed with the mentor, for review by the dissertation committee.

6. Professional Development

- a. Oral presentation skills: All graduate students present a departmental “Neuroblitz” talk once a year, in front of other students and faculty. Students generally also present at journal clubs organized by department-affiliated Centers including the Center for the Neurobiology of Learning and Memory, Institute for Memory Impairments and Neurological Disorders, and the Irvine Center for Addiction Neuroscience.
- b. Pedagogy training: Students also have the opportunity to participate in teaching pedagogy activities including the UCI- HHMI teaching fellows program which provides training in use of evidence-based teaching practices, the GK-12 program which provides training in teaching science in secondary schools, and the Pedagogical Fellows program which trains experienced TAs to provide discipline specific training and mentorship to new TAs.
- c. Leadership training: The graduate student organization within the Department elect two representatives to serve as faculty liaison, attending monthly faculty meetings, and providing input on a broad range of issues.

Two graduate students are also elected to the speaker selection committee are responsible for inviting and hosting 1-3 seminar speakers/year.

7. Thesis Defense

The Thesis Defense is a requirement of the UCI Academic Senate. Students must submit a written Ph.D. dissertation, and then defend their Thesis by providing a formal 1-hour seminar that is open to the public, which is followed by a closed committee meeting.

It is expected that a student receiving a Ph.D. in the department of Neurobiology & Behavior will be able to present and describe a significant body of work that they have been primarily responsible for, with regard to the formulation of the experiments, the acquisition and interpretation of the data, and the writing of a manuscript(s). It is also expected that this work will constitute a novel contribution to the body of scientific knowledge, usually suitable for publication as research articles in one or more peer-reviewed journals.

For PhD students, the normative time for advancement to candidacy is three years. The normative time for completion of the PhD is five years, and the maximum time permitted is seven years.

II. Action Plan

Program Learning Outcomes (as published in the departmental graduate handbook)

PLO1: Core Knowledge

- Demonstrate a basic knowledge of central concepts of Neurobiology & Behavior
- Understand current and emerging concepts in Neurobiology & Behavior.
- Demonstrate specialized knowledge of Neurobiology & Behavior sufficient to carry out substantive independent research.

PLO2: Research Methods and Analysis

- Read and critically evaluate the scientific literature
- Formulate hypotheses based on current concepts in the field
- Design, conduct, and interpret their own research projects.
- Understand the range of tools appropriate for research in their sub-field.
- Understand and follow research ethics

PLO3: Pedagogy:

- Communicate effectively to large and small groups in pedagogical settings including teaching, research seminar and other formats
- Identify and effectively deploy suitable technologies for use in all aspects of instruction

PLO4: Scholarly Communication:

- Review and discuss relevant literature and their significance.

- Publish research results in peer-reviewed publications and in a dissertation
- communicate research results effectively through oral presentations at scientific seminars, conferences, and other venues
- Make clear and cogent oral presentations, including effective use of technology

PLO5: Professionalism

- Write compelling abstracts describing their research for consideration at research conferences
- Prepare oral presentations suitable for presentation at a research conference
- Make effective contributions to research teams and learning seminars.
- Make effective contributions to department, university, community, and professional service
- Mentor junior researchers (e.g., undergraduates, beginning graduate students)

PLO6: Independent Research

- Develop their own research projects that meet high standards of theoretical and methodological rigor with lasting impact
- Produce scholarship that is comparable in scope and format to articles that appear in leading peer-reviewed journals in molecular and biomedical sciences
- Supervise junior researchers (e.g., high school students, undergraduates, beginning graduate students) effectively

Evaluating Program Learning Outcomes

The Department of Neurobiology & Behavior is constantly evaluating its performance based on several streams of data. We evaluate student perceptions at the end of the first year, and via an exit survey at degree completion. These metrics are interpreted by the Assistant Graduate Dean, and the Department Graduate Advisor, and changes are recommended by then when necessary. The Graduate Advisor also tracks and records student progress yearly in a departmental faculty meeting, and evaluates the required yearly IDPs from each student. We use findings from these evaluations and progress reports to identify programmatic problems and address them, and to contact and intervene with students having trouble, giving advice and directing them toward appropriate resources. Students failing to meet department expectations as outlined above are put on conditional academic status, and close monitoring of their plan toward advancement/graduation is implemented.

CORE CURRICULUM AND LEARNING OBJECTIVES

Molecular Neuroscience N206

Cellular Neuroscience N207

Cellular Neuroscience Lab N207L

Systems Neuroscience N208

Behavioral Neuroscience N209

Molecular Neuroscience, Fall 2019

(Neurobio 206)

Instructors: Dr. Mathew Blurton-Jones, 3014 Gross Hall, mblurton@uci.edu
 Dr. Vivek Swarup, 3224 Bio Sci 3, , vswarup@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 27 F	Introduction	Blurton-Jones
30 M	Manipulating gene expression in the CNS-I	Blurton-Jones
Oct 2 W	Manipulating gene expression in the CNS-II	Blurton-Jones
4 F	Protein-protein interactions/Proteomics	Blurton-Jones
7 M	CRISPR	Blurton-Jones
9 W	Cell trafficking and Neurological Disorders	Blurton-Jones
11 F	Neurologic Disorders and Review	Blurton-Jones
14 M	<i>Discussion 1</i>	Blurton-Jones
16 W	<i>Discussion 2</i>	Blurton-Jones
18 F	Exam I	Blurton-Jones
21 M	<i>NO CLASS: SOCIETY FOR NEUROSCIENCE MEETING</i>	
23 W	<i>NO CLASS: SOCIETY FOR NEUROSCIENCE MEETING</i>	
25 F	Gene structure and function in the nervous system	Swarup
28 M	Neurogenetics – I	Swarup
30 W	Neurogenetics – II	Swarup
Nov 1 F	<i>Discussion</i>	Swarup
4 M	Post-transcriptional regulation of gene expression in the nervous system	Swarup
6 W	Post-translational and epigenetic regulation of gene expression in the nervous system	Swarup
8 F	Genomic approaches to neural development and disease	Swarup
11 M	<i>NO CLASS: VETERAN'S DAY HOLIDAY</i>	
13 W	Introduction; Neural Polarity and Induction	Cramer
15 F	<i>Discussion</i>	Swarup
18 M	Exam II	Swarup
20 W	Regionalization	Cramer
22 F	Neurogenesis and Neuronal Migration	Cramer
25 M	Neuronal Fate Specification	Cramer
27 W	<i>Discussion</i>	Cramer
29 F	<i>NO CLASS: THANKSGIVING HOLIDAY</i>	
Dec 2 M	Axon Guidance	Cramer
4 W	Synaptogenesis and synaptic pruning	Cramer
6 F	<i>Discussion</i>	Cramer

9	M	Final Exam (10:30 – 12:30)	Cramer
7	F	<i>Discussion</i>	Cramer
11	M	Final Exam (10:30 – 12:30)	Cramer

Cellular Neuroscience (NB&B 207) - Winter 2020

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

Instructors – Ian Parker (course coordinator) iparker@uci.edu, Gyuri Lur, glur@uci.edu,
Katumi Sumikawa ksumikaw@uci.edu

Grading Policy: Grades will be based on exams and take-home assignments

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

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

Date	Topic
<i>Section #1 Membranes and Ion Channels (I.P.)</i>	
Jan 6	Introduction to electrical concepts
Jan 8	Passive electrical properties of membranes
Jan 10	Membrane potential, Nernst, Goldman equations
Jan 13	Ion channels – electrophysiology, patch clamping
Jan 15	Ion channels – voltage-gated channels
Jan 17	Ion channels – ligand-gated channels
Jan 20	Martin Luther King Holiday
	Grade for section #1 is based on take-home assignments & exam
<i>Section #2 Synaptic Transmission (G.L.)</i>	
Jan 22	Action potentials
Jan 24	The Hodgkin & Huxley Axon
Jan 27	Chemical synapses, quantal transmission
Jan 29	Ca ²⁺ and neurotransmitter release, EPSPs and IPSPs
Jan 31	Slow synaptic potentials
Feb 3	Synaptic integration
Feb 5	Discussion/review
Feb 7	Section #2 EXAM
<i>Section #3 Neurotransmitters, Receptors and Second Messengers (K.S.)</i>	
Feb 10	Neurotransmitters
Feb 12	Molecular mechanisms of neurotransmitter release
Feb 14	Neurotransmitter receptors
Feb 17	Presidents Day Holiday

Feb 19	Second messenger pathways #1
Feb 21	Second messenger pathways #2
Feb 24	Synaptic plasticity
Feb 26	Discussion/review
Feb 28	Section #3 EXAM

Cellular Neuroscience N207 - Learning Objectives

Parker

Electrophysiology of neuron membranes and ion channels

At the completion of this section students should have gained intuitive and quantitative understandings of how the resting membrane potential of neurons is generated, and how the membrane potential is regulated by the openings of voltage- and ligand-gated ion channels. Students will be expected to know and understand each of the topics listed below, to solve numerical examples, and to apply this knowledge to analyze experimental data from electrophysiological experiments. Assessment will be in the form of in-course take-home quizzes as well as a final exam.

Lecture 1, Introduction to electrical concepts

- Ohm's Law; voltage, current, resistance
- Other electrical concepts; charge, conductance
- Circuits with resistors in series and parallel; potential dividers
- Capacitance; factors determining the capacitance of a capacitor
- Charging of capacitors; time constants of RC circuits; high- and low-pass circuits

Lecture 2, Passive electrical properties of membranes

- Structure of cell membranes, electrical properties
- Concepts of specific membrane capacitance and resistance
- Input resistance of a cell
- A neuron as a passive RC circuit
- Passive electrical transmission, cable properties of axons, space constant
- Dependence of space constant on diameter and other properties of an axon

Lecture 3, Origin of the resting potential

- Diffusion as a random walk process
- Diffusion potentials arising from selective movement of ions across a membrane
- Concept of the equilibrium potential; Nernst equation to predict equilibrium potential
- Ion concentration gradients across cell membranes; selective permeability to K^+ as primarily determining the resting potential
- Goldman equation for membranes permeable to more than one ion

Lecture 4, Ion channels and how to record from them

- Ways of looking at ion channels; molecular structure, physical structure, electrophysiological properties
- Generic properties of single channel gating and ion conductance
- Channel conductances, I/V relationship
- Patch clamp technique for recording single-channel currents
- Analysis of patch clamp records to determine single channel kinetics and conductance

Lecture 5, Voltage-gated ion channels

- Diversity of voltage-gated channels, categorization by ion selectivity and gating properties
- Relationships between single-channel and whole-cell currents as exemplified by voltage-gated Na^+ and K^+ channels
- Mechanism of voltage-dependent activation, gating charge movement
- Channel inactivation mechanisms, 'ball and chain' model for Shaker K^+ channel inactivation

Lecture 6, Ligand-gated ion channels

- The nicotinic ACh receptor at the nerve-muscle junction as an exemplar of a ligand-gated ion channel
- Pentameric structure of the nAChR with two ACh binding sites, and consequences for concentration-dependence of channel gating
- Analysis of single-channel kinetics to derive Hill coefficient
- A simplified model of nAChR channel gating to explain kinetic parameters of channel open and closed time distributions

Lur
The action potential and synaptic transmission

At the completion of this section students should have gained understanding of how excitable membranes generate the action potential, how synaptic transmission occurs in general and specifically for excitatory and inhibitory synapses that involve ionotropic and metabotropic receptors. Each lecture will include historical background that demonstrates the evolution of concepts and thinking about nerves and synapses. Students will be expected to know and understand both general concepts and important details each of the topics listed below. Assessment will be in the form of a final exam.

Lecture 7, Action potentials

- Resting potential, equilibrium
- Action potential
- Voltage-gated membrane currents

Lecture 8, The Hodgkin & Huxley Axon

- Membrane permeability during the action potential
- Action potential threshold
- Action potential propagation

Lecture 9, Chemical synapses, quantal transmission

- Electrical synapses and transmission
- Chemical synapses
- Quantum hypothesis

Lecture 10, Ca²⁺ and neurotransmitter release, EPSPs and IPSPs

- Miniature end plate potentials
- Quantal analysis
- Calcium requirement for synaptic transmission
- Fast (ionotropic) EPSPs
- Ionotropic IPSPs
- Residual calcium hypothesis

Lecture 11, Slow synaptic potentials

- Metabotropic receptors and slow synaptic potentials
- Neuromodulation

Lecture 12, Synaptic integration

- Integration of multiple inputs at synapses
- Spatial summation of inputs
- Temporal summation of inputs

Sumikawa

Neurotransmitters, neurotransmitter receptors and second messengers

At the completion of this section students should have understandings of the basic mechanisms of synaptic transmission, controlling neuronal signaling, and synaptic plasticity. Main learning objectives for each lecture are listed below.

Lecture 13, Neurotransmitters

- Changes in synthesis, storage, release, action, and removal can either increase or decrease synaptic potentials
- Synthesis, storage, and removal require specific proteins (enzymes and transporters), some of which are specific markers for identification of cell types
- Transporters function to store or remove neurotransmitters

Lecture 14, Molecular mechanisms of vesicular release

- Vesicular neurotransmitter release requires unique proteins
- Synaptic potentials can be modulated presynaptically
- Presynaptic ion channels and neurotransmitter receptors are involved in modulating synaptic potentials

Lecture 15, Neurotransmitter receptors

- Neurons produce synaptic signals by controlling the flow of ions through postsynaptic neurotransmitter receptors
- Neurotransmitter receptor channels have two important properties: they are ion-specific (Na^+/K^+ , Ca^{2+} , or Cl^-) and regulated
- Neurotransmitter receptor function can be regulated by voltage, external ligands (neurotransmitters), internal ligands (second messengers), phosphorylation, and protein-protein interactions

Lecture 16, Second messenger pathways #1

- Many G protein-coupled receptors (GPCRs) can activate multiple G proteins

- GPCRs enable activation of different second messenger pathways dependent on coupling of receptor subtype

Lecture 17, Second messenger pathways #2

- Ion channels, ligand-gated and G protein-coupled receptors activate signaling pathways to produce second messengers
- Second messengers regulate the activity of second messenger-dependent protein kinases

Lecture 18, Synaptic plasticity

- Second messenger-dependent protein kinases regulate ion channels and receptors
- Ion channels, ligand-gated and G protein-coupled receptors regulate protein phosphorylation
- Phosphorylation is important mechanisms for modulating receptor function/number, and thereby neuronal function

207L CELLULAR NEUROSCIENCE LABORATORY CLASS

35th Annual Edition 2020

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

Experiments (March 11th – 18th)

1. Compound action potential of sciatic nerve. (I.P.)
2. Intracellular recording from muscle – resting potential, miniature end-plate potentials. (I.P.)
3. Quantal analysis of transmitter release at the muscle endplate. (I.P.)
4. *Xenopus* oocytes: voltage clamp and Ca^{2+} -dependent Cl^- currents evoked by IP_3 (A.D.)
5. Total internal reflection microscopy of Ca^{2+} signals in neuroblastoma cells (I.S.)
6. Extracellular field recording from rat hippocampal slices. (Metherate lab) (R.M., G.L.)

March 19th: Preparation for presentations

March 20th: Student presentations (lunch : pizza provided)

207L Cellular Neuroscience Laboratory - Learning Objectives

In this full-time, hands-on laboratory class students will;

- Learn practical skills of intracellular and extracellular voltage recording using glass and wire microelectrodes.
- Reinforce their knowledge of synaptic transmission by undertaking classical experiments to record and analyze the quantal nature of neurotransmitter release.
- Study the compound action potential in frog sciatic nerve.
- Analyze properties of excitatory and inhibitory synaptic transmission in the hippocampal slice preparation.
- Learn the use of voltage clamp to determine passive and active properties of the cell membrane.
- Experience the use of advanced imaging techniques to study cellular calcium signaling.

SYSTEMS NEUROSCIENCE (FALL 2019)

[Neurobio 208 and Anat 210]

Neurobio 208 is required for 1st year graduate students in Neurobiology and Behavior and serves as “S” area core courses for the INP. Anat 210 is open to all graduate students in Anatomy and Neurobiology. Graduate students from other departments may enroll in either Neurobio 208 or Anat 210 with permission from the course director, Dr. Ron Frostig.

Time/place: 9:00-10:20AM, MWF in MH 2246

Text: *Neuroscience*, 6th Edition, Purves, D. *et al.* (Eds.) Sinauer, 2017. The instructors will distribute other readings.

Exams and grading: The final grade will be based on performance on the midterm exams. The instructor for that section will announce the format of each exam. Exams will be predominately essay. There will be **no** cumulative final exam, and grades will be normalized to the number of lectures leading to each midterm. Final grade will be based on averaging of all midterms.

Participating Faculty: (from the Department of Neurobiology & Behavior)

Prof. Ron Frostig, Course Director,
 Prof. Steve Mahler,
 Prof. Liz Chrastil

Fall 2019

Date	Topic	Instructor	Readings (in text unless noted)
Fri 9/27	Introduction to sensory systems	Frostig	
Mon 9/30	The eye: structure and function I	Frostig	Ch.11
Wed 10/2	The eye: structure and function II	Frostig	Ch.11
Fri 10/4	Central visual pathways I	Frostig	Ch.12
Mon 10/7	Central visual pathways II	Frostig	Ch. 27
Wed 10/9	Plasticity in the visual system	Frostig	Ch. 25
Fri 10/11	Color vision	Frostig	
Mon 10/14	Discussion: visual system	Frostig	

Wed 10/16	Midterm I	Frostig	
Fri 10/18	SFN – Meeting No class		
Mon 10/21	SFN – Meeting No class		
Wed 10/23	SFN – Meeting No class		
Fri 10/25	Somatosensory System I	Frostig	Ch. 9
Mon 10/28	Somatosensory System II	Frostig	Ch. 9
Wed 10/30	Auditory System I	Frostig	Ch. 13
Fri 11/1	Auditory system II	Frostig	Ch. 13
Mon 11/4	Discussion Auditory- Somatosensory	Frostig	
Wed 11/6	Midterm II	Frostig	
Fri 11/8	Prefrontal Cortex 1:Structure, Function 1:Structure, Function	Mahler	Miller & Cohen. An integrative theory of prefrontal cortex function. Annu. Rev. Neurosci. 2001. 24:167-202
Mon 11/11	No class- Veterans Day		
Wed 11/13	Prefrontal Cortex 2: Consciousness and other functions	Mahler	Crick & Koch. What is the function of the claustrum? Phil. Trans. R Soc. B 2005. 360,1271-1279 Baizer et al., 2014. Comparative organization of the claustrum: What does structure tell us about function?
Fri 11/15	Modulatory Systems-Theory and the Clinic	Mahler	Nutt et al., 2015 The dopamine theory of addiction: 40 years of highs and lows Berridge, Robinson 2016. Liking, wanting, and the incentive-sensitization theory of addiction
Mon 11/18	Modulatory Systems 1	Mahler	Purves Ch.6
Wed 11/20	Modulatory Systems 2	Mahler	Trillo et al 2013. Ascending monoaminergic systems alterations in Alzheimer's disease. Translating basic science into clinical care

Fri 11/22	Midterm III	Mahler	
Mon 11/25	Self-Motion and the Vestibular System	Chrastil	Ch 14
Wed 11/27	Motor Cortex	Chrastil	Ch 17
Fri 11/29	No class- Thanksgiving		
Mon 12/2	Basal Ganglia	Chrastil	Ch 18
Wed 12/4	Cerebellum and Parietal Cortex	Chrastil	Ch 19
Fri 12/6	Midterm IV	Chrastil	

NEURBIO 209 LEC A: BEHAVIORAL NEUROSCI (11500)

N209: Behavioral Neuroscience
Spring 2019

The focus of this course is on understanding the relationship between brain and behavior. The human brain's major naturally-selected function is to generate adaptive behavior under a variety of conditions, including with reference to prior experience. In this course we will discuss how the brain mediates major behavioral functions, how these go awry in psychiatric disorders, as well as major methodological approaches used in behavioral neuroscience research. The format of the course is a mixture of presentations led by the instructor and seminar style discussions incorporating assigned readings. There is a strong emphasis on class discussion and participation, with students expected to have read, thought about, and discuss primary-source papers.

Lecture times: MWF 9-10:20AM; McGaugh Hall 2246

Web site: The class web site <https://canvas.eee.uci.edu/courses/16127> will include up-to-date information on the lecture schedule and assigned readings. Lecture slides will also be posted.

Add & Drop Policy: Adds and drops are handled exclusively through WebReg. The add/drop deadline is April 13, 2018 and students are responsible for all materials from the start of the term. Failure to take any exams or quizzes, even those given before you have added the course, will result in a zero score for each quiz or exam.

Instructors:

Stephen Mahler (coordinator): mahlers@uci.edu

Norbert Fortin: norbert.fortin@uci.edu

Christie Fowler: cdfowler@uci.edu

Grading: There will be three midterm exams and each will account for 20% of your total grade. 15% will be based on an end-of-term project proposal, 5% on your participation in the "Neuroscience Controversies" session, and 20% on class participation.

Neuroscience Controversies:

Near the end of the quarter, we will engage in an active learning session where you will construct a debate-style argument in favor of an assigned position in a current neuroscience controversy. You will work in a group of 2-3, and will be assigned a position to defend in the debate. Each group member will speak in the debate, presenting an informal opening statement, rebuttal, or closing statement. We expect this format will help develop critical thinking and group operation skills.

Final Presentation:

Presentations will occur on the last 3 days of class. You will do a "data blitz" style presentation (maximum 15 min, preferably 10) on a research question of your choice stemming from presentations/discussions we've had in class.

Guidelines:

15m total time per student, so aim for a maximum of 10min to make sure there is plenty of time for questions (and there will be questions!). You will be cut off at 15min exactly (not counting any questions asked during the presentation), so be careful. Shorter is not equal to worse! We don't need all the details or nuance, the goal here is to convey the major points in an efficient and punchy manner.

Your assignment is to design an experiment or set of experiments to address any of the topics raised during class (but not something that you have done as a project in a rotation lab). KEEP IT SIMPLE! Pretend you're pitching the idea to a grant agency / donor on a 10min elevator ride (a skyscraper I guess?). This is not supposed to be a full grant, just an experiment that tests a single, currently unknown concept or question.

The experiment should be viable, but don't worry about actual costs, and assume a lenient (but realistic) IRB/IACUC. In other words: "Effects of space travel on working memory=OK. Effects of time travel on working memory=not OK." (but make sure there is a reason to think, e.g., space travel might affect memory, since gravity is known to affect pyramidal cell function).

Pick a topic, focus in on a concrete question, and design the experiment. Clarity in your thinking is key here. Why are you asking this question--what gap in knowledge is there, and why should I care about this topic? Is the experiment really testing what you want it to? How would we interpret your results?

The presentation should have:

A **brief** background setting the stage for what we know and don't (1-2 slides)

The question and clearly stated hypothesis (1 slide)

The experiment and how the results will address the issue (1-2 slides)

Alternative outcomes / potential problems (1-2 slides).

You will be graded on 1) clarity of the background information/topic to be studied, 2) clarity of, and importance of the question to be addressed 3) efficacy of your experiment in providing an answer to that question, 4) presentation style and ability to answer questions, 5) respecting the time limit.

Policy on Academic Dishonesty: The UCI policy on academic dishonesty is stated at: <http://www.editor.uci.edu/catalogue/appx/appx.2.htm#academic>. Lying to an instructor with the intent of improving a grade, or use of a restricted electronic device during an exam are considered forms of academic dishonesty. Any student aware of academic dishonesty is encouraged to bring this to the attention of the instructor; your confidentiality is guaranteed.

Readings: It is your responsibility to read the assigned articles before class. This is a discussion-based class and having read the materials ahead of time is essential **Note:** Readings and schedule subject to change at the instructors' discretion.'

Lecture schedule and reading assignments

Date	Instructor	Topic	Reading
Mon 04/01	Mahler	Intro, Genes and Brain Evolution 1	Syllabus
Wed 04/03	Mahler	History and conceptual issues in analysis of brain-behavior relationships (McGaugh Guest Lecture)	McGaugh (2003) Ch 2-3
Fri 04/05	Mahler	Genes and Brain Evolution 2	Dawkins, Selfish Gene Ch. 3-4
Mon 04/08	Mahler	Evolutionary Psychology	Cosmides & Tooby, 2006
Wed 04/10	Mahler	Mind and Brain	Kaushik et al 2012; Worth et al 2013
Fri 04/12	Mahler	Functional Neuroanatomy: Neural Circuits in Motivated Behavior	Zahm 2006; Richard et al 2013
Mon 04/15	Mahler	Sleep and Wakefulness	Schwartz & Kilduff, 2015; Donlea et al 2017
Wed 04/17	Mahler	Homeostasis: Feeding, Drinking & Temperature	Zimmerman et al 2017; Munzberg et al, 2016
Fri 04/19	Mahler	Exam 1	
Mon 04/22	Fowler	Hormones	Balthazart et al., 2018; Oberlander & Woolley, 2017
Wed 04/24	Fowler	Development	Gilmore et al., 2018; Sorrells et al., 2018
Fri 04/26	FortFowlMahl	CNLM Meeting	
Mon 04/29	Fowler	Stress and Aggression	Joels & Baram, 2009; Falkner et al., 2016
Wed 05/01	Fowler	Sex and Social Behavior	McCarthy et al., 2017; Amadei et al., 2017
Fri 05/03	Fowler	Reward, Aversion and Addiction	Morales & Margolis, 2017; Wise & Koob, 2014
Fri 05/06	Fowler	Psychopathology	Birnbaum & Weinberger, 2017; Yang et al., 2018
Wed 05/08	Fowler	Neurodegenerative Disorders	Baecher-Allan et al., 2018; Liddel et al., 2017
Fri 05/10	Fowler	Exam 2	
Mon 05/13	Fortin	Multiple Memory Systems	Sherry & Schacter (1987); Squire & Zola-Morgan (1991)
Wed 05/15	Fortin	Functional Neuroanatomy of Medial Temporal Lobe	Van Strien et al. (2009)
Fri 05/17	Fortin	Declarative, Episodic, and Semantic Memory	Eichenbaum (2000); Squire & Zola-Morgan (1991); Tulving & Markowitsch (1998)
Mon 05/20	Fortin	Spatial Memory and Computations (McNaughton Guest Lecture)	McNaughton et al., (2006); Knierim (2015)

Wed 05/22	Fortin	Attention	Petersen & Posner (2012); Reynolds et al., (2013)
Fri 05/24	Fortin	Emotion	Phelps (2006); McGaugh (2013); Etkin et al., (2015)
Mon 05/27		Holiday - no class	
Wed 05/29	Fortin	Exam 3	
Fri 05/31	FortFowlMahl	Neuroscience Controversies	
Mon 06/03	FortFowlMahl	Presentations	
Wed 06/05	FortFowlMahl	Presentations	
Fri 06/07	FortFowlMahl	Presentations	

N209 – Behavioral Neuroscience. Learning Objectives

Mahler

Learning Objectives: At the end of this section, the student should be able to discuss the following topics.

Lecture 1: Genetics, Epigenetics, and Brain Evolution

- Evolution by natural, sexual, artificial, and other types of selection
- The brain evolved because behavior it produced was naturally selected.
- How do genes influence the brain?
- How does experience influence the brain?
- The selfish meme?

Lecture 2: Evolutionary Psychology

- Psychological modules
- Fundamental requirements of an evolved psychological adaptation
- Types of evidence that could support an evolutionary basis for a behavior
- Experimental evolutionary psychology?
- Spandrels, just-so stories, and the trouble with evolutionary psychology

Lecture 3: History and conceptual issues in analysis of brain-behavior relationships

- Philosophy and history of mind
- Where is “the mind?”
- Materialism vs. Dualism
- The neuron doctrine
- War of the soups and the sparks

Lecture 5: Mind and Brain

- Big Brains-Why?

- Mind control—What if “we” are not in control?
- brain parasites
- addiction and other mental illnesses

Lecture 6: Functional Neuroanatomy: Neural Circuits in Behavior

- Methods for studying circuits
- Groupers and Chunkers: searching for meaningful principals of brain organization
- Extended Amygdala
- Corticostriatopallidal circuits
- Ascending modulatory systems
- Specialization vs. general purpose circuits

Lecture 7: Sleep and Wakefulness

- What is sleep “for?”
- Stages of Sleep
- studying sleep in humans and animals
- Sleep and wakefulness circuits
- Sleep disorders

Lecture 8: Homeostasis: Feeding, Drinking & Temperature

- Principals of homeostasis
- Brain/Body Communication
- Hypothalamus anatomy
- Feeding mechanisms
- Drinking mechanisms
- Temperature regulation

Fowler

At the end of this course section, the student should be able to independently discuss:

Lecture 9: Hormones

- Describe the function of the main endocrine glands and the mechanism through which they influence neural activity
- Demonstrate an understanding of the different types of hormones, their receptors, and signaling mechanisms
- Evaluate considerations for conducting research studies in both sexes

Lecture 10: Development

- Identify the different stages of brain development
- Evaluate the effects of the environment on neural processes in consideration of developmental stage
- Describe mechanisms guiding brain development for normal physiological function

Lecture 11: Stress

- Describe the effects of early life stress on development

- Compare and contrast the impact of acute or chronic stress on HPA activation and resulting brain function
- Evaluate the global effects of stress on cellular function and related impact on behavior

Lecture 12: Sex and Social Behavior

- Recognize the brain regions and cellular signaling mechanisms implicated in sexual and social behaviors
- Demonstrate an understanding of the circuit connections between brain structures with relevance to function
- Evaluate the behavioral procedures used to study social behavior with an understanding of potentially confounding variables

Lecture 13: Motivated Behavior: Reward, Aversion and Addiction

- Identify various types of motivated behaviors and methods of assessment in animal models
- Describe the differences between factors that promote or decrease the likelihood of a future behavior
- Evaluate the impact of various brain structures in mediating reward- or aversion-related processing
- Compare and contrast the current hypotheses in the field for factors underlying drug addiction and formulate an evidence-based definition

Lecture 14: Psychopathology

- Describe the symptoms characteristic of Schizophrenia and affective disorders
- Identify and evaluate the current evidence for the neurobiological mechanisms underlying the disease state
- Compare and contrast similar factors contributing to the disease state, with relevance for comorbidity
- Evaluate the mechanism of action and efficacy for currently available pharmacotherapeutics

Lecture 15: Neurodegenerative Disorders

- Identify the symptoms and brain dysfunction found in Alzheimer's disease, Huntington's disease and Multiple Sclerosis
- Describe the current understanding of genetic and neurobiological factors contributing to the disease state
- Evaluate the mechanism of action and efficacy for currently available pharmacotherapeutics

Fortin

Lecture 16: Functional Neuroanatomy of Medial Temporal Lobe

Hippocampus
Amygdala
Temporal Cortex

Lecture 17: Declarative Memory

Brain Substrates
Episodic Memory
Experimental Methods
 Animals
 Humans
Disorders

Lecture 18: Multiple Memory Systems

- Brain Substrates
- Nondeclarative memory
- Emotional Memory
- Experimental Methods
 - Animals
 - Humans

Lecture 19: Emotion

- Neural Substrates
- Interaction with Cognition
- Experimental Methods
 - Animals
 - Humans

Lecture 20: Attention

- Effects on Perception
- Top down vs. bottom up
- Effects on memory
- Experimental Methods
 - Animals
 - Humans

Lecture 21: Spatial Memory and Computational Models

- Hippocampus/cortex interactions
- Place cells
- Grid cells
- Modeling Memory

Lecture 22: Language and Lateralization

- “Right vs. Left Brained”
- Cortical Language Areas
 - Broca’s
 - Weirneke’s
- Split Brain Studies

UCI - NEUROBIOLOGY & BEHAVIOR GRADUATE PROGRAM

ADVANCED CLASSES

2020-21

University of California, Irvine Department of Neurobiology & Behavior

The list below includes advanced graduate classes offered by the department. In addition, with the approval of the graduate advisor, appropriate graduate classes offered by other departments may be substituted for the requirement of a minimum of four advanced graduate classes.

Fall 2020

NEURBIO 220. Neural Coding, Computation, and Dynamics. 4 Units.

Theoretical principles and biological mechanisms underlying how brains acquire, assimilate, store, and retrieve information, compute adaptive responses to external inputs, and how knowledge is extracted from experience to generate an internal model of the world.

NEURBIO 260. Auditory Neuroscience. 4 Units.

Multidisciplinary overview of brain mechanisms of hearing. Emphasizes breadth of auditory function and research: single neurons to psychoacoustics, the cochlea to the cortex, and basic science to clinic.

Winter 2021

NEURBIO 227. Bioinformatics and Systems Biology. 4 Units.

Students learn the fundamentals of bioinformatics, genomic approaches, and Linux and R program in order to analyze RNA-sequencing data.

NEURBIO 228. Psychophysiological Methods in Clinical Research . 4 Units.

Introduces the principal signals of psychophysiology and outlines how measures calculated from these signals can be applied in clinical research and practice.

NEURBIO 237. Neurobiology of Brain Aging. 4 Units.

Outlines some of the significant changes that occur in the aging brain, with a special emphasis on risk factors and protective strategies that promote successful brain aging. Topics include changes in synaptic plasticity, neurotrophic factors, and molecular mechanisms in aging.

NEURBIO 240. Advanced Analysis of Learning and Memory. 4 Units.

Advanced analysis of contemporary research concerning the nature and neurobiological bases of learning and memory. Special emphasis is given to time-dependent processes involved in memory storage.

NEURBIO 249. Electronics for Biologists. 4 Units.

Basic principles of electricity; properties and use of discrete components and integrated circuits; circuit analysis and design. Intended for advanced students in the life sciences.

NEURBIO 257. Statistics for Neurobiologists. 4 Units.

Introduction to common methods for statistical analysis used in neurobiology. Topics covered include t-tests, ANOVAs, correlations and regressions, general linear model, power analysis, and non-parametric tests.

Spring 2021**NEURBIO 233. Neurobiology of Drug Addiction. 4 Units.**

Provides a comprehensive overview of topics in the addiction field, including drug pharmacology, models/approaches to investigate addiction, brain circuits, genetics, epigenetics, and the cellular and molecular biology of drug addiction.

NEURBIO 247. Programming for Neuroscience Research . 4 Units.

A neuroscience-specific introduction to programming and data analysis using either MATLAB or Scientific PYTHON. Students will learn general programming skills and effective use of programming for data management, statistical analysis, and image analysis.

NEURBIO 292. Scientific Communication. 4 Units.

Students learn how to effectively communicate scientific ideas and results. Activities include learning how to effectively write a scientific proposal, how to perform a coherent, persuasive slide presentation, and how to give meaningful, constructive review critiques.

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.

Individual Development Plan (IDP)

UCI's Graduate Council adopted a plan requiring all graduate students to complete an annual Individual Development Plan (IDP) and to discuss it with their faculty research advisor in a one-on-one meeting. This process must be completed every academic year. IDPs are an excellent tool to help you develop as an independent scientist. They also help your advisor to better mentor you along this journey.

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?: _____