

Welcome

Welcome to graduate study in **Molecular and Computational Biology** at USC! We hope that your years here are exciting and fruitful. The purpose of this guide is to try and help smooth the way during your first few weeks, as well as to provide some basic information with regard to our program, being a graduate student at USC, and life in Los Angeles in general.

In addition to this guide, a good source of information is provided in a free booklet entitled *SCampus*, which can be obtained at Topping Student Center or online at <http://www.usc.edu/dept/publications/SCAMPUS/>. Of course, it is always a good idea to solicit information and advice from more senior graduate students and from faculty.

Susan Forsburg and Steve Finkel serve as the faculty advisors to first-year students on the Molecular Biology Ph.D. track and Michael Waterman serves as the advisor to the first-year students on the Computational Biology and Bioinformatics Ph.D. track. You will meet your advisor(s) during the orientation period. Feel free to talk to your advisor at any time or with any faculty member until you have settled on a permanent advisor.

Our support staff is also available to help out with procedures for registration and other logistical details. Linda Bazilian (x11088, bazilian@usc.edu) is the Graduate Programs Manager for Biological Sciences; she is located in AHF 107, mc 0371. Eleni Yokas (x05772, eyokas@college.usc.edu) is the Administrative Services Manager for MCB and Megan Linford (x05188, linford@college.usc.edu) is the Student Services Advisor for MCB; they are both located in MCB 201, mc 2910.

Once again, welcome to the program!

Myron F. Goodman, Professor
Director, Molecular and Computational Biology Section

Welcome

Dear Incoming Graduate Students,

On behalf of the Biology Graduate Student Association, I want to welcome you to the Molecular and Computational Biology program here at USC.

We will be planning a number of events throughout the year for you to meet your fellow graduate students as well as faculty and post-docs in the program. Following a long tradition, the first of these will be a Welcome Barbeque for you in the Fall. There is also the Annual Department Retreat from November 3rd to the 5th at the Aliso Creek Inn located in Laguna Beach. Please mark your calendars now!

I welcome you to participate in all our events, including our Friday student-run seminar and social hours. Don't miss the opportunity to join BGSA and help make our program a rewarding experience for everyone. Please feel free to send me your questions and comments by e-mail to mccrow@usc.edu.

And again, welcome to USC and to our program.

John McCrow, President
Biology Graduate Student Association

Program Life

Departmental Seminars

An important part of your training is the opportunity to attend and participate in research seminars and “MolBio Lunch”. Seminars are held on Thursdays at 2:00pm in MCB 101 and Fridays at 12:00 Noon in MCB 101. A list of invited speakers will be given to you near the beginning of each semester. Faculty and students select seminar speakers. Seminars last for one hour and there is time for questions and answers immediately following. **You are expected to attend all molecular and/or computational biology seminars.** Notices will be posted prominently in the MCB Interaction Lounges as well as updated weekly on the Biological Sciences Homepage: <http://www.usc.edu/dept/LAS/biosci/seminars/index.html>.

Additionally, other sections of our department offer their own seminar series. The other sections are: Neurobiology, Marine and Environmental Biology, and Integrative and Evolutionary Biology. Other departments and schools that offer seminars of interest include: Earth Sciences, Chemistry, Gerontology and at the Health Sciences Campus, Biochemistry, Microbiology, Pathology, Cell and Anatomy, Molecular Pharmacology and Toxicology. Finally, schedules of seminars offered at other local universities will be posted as they are received in the MCB mailroom. Be sure to check the bulletin boards weekly for announcements. Many seminars are also posted online at <http://www.usc.edu/programs/pibbs/site/seminars.html>.

There are many benefits to attending seminars. You will learn a great deal, especially in areas outside your expertise. You will have the chance to meet distinguished senior scientists. These contacts will help you in your research and could lead to future letters of reference or postdoctoral opportunities.

“MolBio Lunch” (BISC 542) is a meeting on Thursdays at 4:00PM in MCB 101. All faculty, students and staff are encouraged to attend. Students present seminars about their own research.

Computational Biology Journal Club (BISC 542) is held Thursday at 12:00noon in MCB 101. Students present cutting-edge research from journal articles and all students participate in a discussion of the article.

Teatime

Our section sponsors a tea every Tuesday at 3:00PM during the academic year. You will receive reminders on where it will be held each week: either in the lobby or 2nd, 3rd or 4th floor Interaction Lounges. We also offer tea following the Thursday 2:00 pm seminar.

The Molecular and Computational Biology Office

There are two offices from which you can obtain administrative support: AHF 107 and MCB 201.

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The section office is located in MCB 201. Megan Linford is the Student Services Advisor and organizes first-year lab rotations and qualifying exams, as well as any other student needs that arise at the section level. Christina Tasulis is the Administrative Assistant for the section. If you would like to sign up to attend a student-hosted speaker luncheon, please see Christina. Christina also handles room bookings and outgoing mail (FedEx, etc.). Eleni Yokas is the Administrative Services Manager. If you need building access or need to report a maintenance problem, please see Eleni. Robyn Scancich is the Contracts and Grants Coordinator and handles finances for the department, including reimbursements and handing out paychecks.

The Biological Sciences department office is located in AHF 107. Please see Linda Bazilian, Graduate Programs Manager, if you have any questions about registration, grades, Graduate School requirements, etc. For research or academic matters, please see your faculty advisor. We cannot provide you with secretarial services, so you will have to do your own word processing, photocopying, and library work.

Offices, Mail, Keys

All students receive incoming mail in the mailroom in MCB 201B. Mail should be addressed as follows: Molecular and Computational Biology Section, Department of Biological Sciences, University of Southern California, MCB 201B, Los Angeles, CA 90089-2910. The 9-digit Zip Code is extremely important because the last four digits (2910) identify the Molecular and Computational Biology building. These digits are all that is necessary for intercampus mail. Outgoing mail, both intercampus and stamped, can be left in the office mailroom for pickup by Mailing Services.

Card access to the building and labs can be obtained from Eleni Yokas in the MCB office. We take the matter of security very seriously. You must do your part to maintain the safety of the people and property that we depend on. Never leave a door propped open, especially after hours. Do not give your card to others. If you see someone around the labs or halls that you do not recognize, call security (x06000).

The Conference Rooms (MCB 121, 221, 321 and 421) are available for use. A sign-up calendar is kept in the MCB Office (MCB 201). See Christina Tasulis if you need to reserve a room. Please be sure to clean up any food left while eating in the conference room.

Libraries

USC has active subscriptions to online versions of most relevant research journals. If you access the journal from a USC IP address (either your own approved computer, or a lab computer) you will be able to retrieve most papers.

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For print sources, the Seaver Science Library (SSL), located in the Seaver Science Center, is the principal science library on the main campus at USC. A good collection of current journals, arranged in alphabetical order, will be found on open shelves on the first floor. Older journals are bound and shelved together with books on the upper floors. Periodicals cannot be checked out, but photocopiers are available in the library. See the reference desk on the first floor for additional information and help (i.e., database searches, computer networks, etc.)

The Doheny Library (DML) is the main undergraduate library with many general interest books, periodicals, and reference materials. The Hancock Collection and Archives are housed within Doheny Library and are especially strong in the marine sciences and systematics. USC students who have USC library cards may request use of Special Collections materials from the online library catalog Homer.

A USC library card must be obtained for library privileges. See the person at the main circulation desk in DML or SSL. You must have your I.D. card with a current registration sticker. Stickers are available from the section office at the beginning of each semester and are valid for one semester only.

There are several excellent libraries off campus. Within the USC system, there is the Norris Medical Library on the Health Sciences Campus. Journal articles can be copied for you and sent via campus mail, but this takes two weeks or so. Inquire at the reference desk in SSL if you're interested in this service. By far the best off campus library is UCLA's Biomedical Library. Just about any journal, no matter how obscure or old can be found there. There are numerous copying machines available using debit cards that can be purchased from vending machines. USC students with valid identification can obtain a UCLA library card. Inquire at the circulation desk in the Biomedical Library.

Information on Computing

USC maintains an extensive computer network that can be accessed from several public user rooms around campus, by modem from a home computer, and, most importantly, from any computer connected to local networks such as the Ethernet. Some software is available on the campus network, and services such as electronic mail, database searching, and bulletin board access is provided free of charge to graduate students.

Computer accounts will be created automatically for all students enrolled in degree programs. Accounts must be activated via the Web at www.usc.edu/firstlogin. To access this form, students can visit one of five public computing areas (Leavey Information Commons, KOH 206, SAL 125, and WPH B34 on the University Park campus, or the Norris Medical Library on the Health Sciences Campus), or via any USC networked computer. The Computing Centers also offer advice and training sessions on using the system and its software.

Most labs have shared computers for use of laboratory members. Once you have joined a lab, for

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example during a rotation, you may typically use that lab's computers for educational and professional activities. You should not use lab computers for Internet surfing or downloading any personal material.

Students who wish to connect to the university network using their own computer will need to register the hardware address (MAC address) after they have established their account. Directions are on the website above. Once registered, you can connect by wireless (available in most buildings) or by an Ethernet port. For remote access, if you are dialing by modem, you will need to install and configure PPP software on your personal computer. Free PPP software can be downloaded from USC. If you wish to access the USC network remotely using your own ISP (e.g., an Earthlink account or something similar), you will have to obtain VPN software from Information Technology Services to gain access past the firewall.

Computer accounts will be available to enrolled students two weeks before classes begin. For more information on automatic accounts, please feel free to contact either USC's Customer Support Center or Computer Accounts Administration office at x05555, or email to (accounts@usc.edu).

Your USC-assigned email account is considered your OFFICIAL email account. You must monitor this account or arrange for email to be forwarded from this account to your primary email account. You are responsible for keeping up to date on any email correspondence sent to your USC email address.

University policies govern the use of the computer network and mail services. **Inappropriate or harassing emails or illegal downloads are grounds for disciplinary action** up to and including dismissal. For more information, see <http://www.usc.edu/its/policies/student/>.

Registration Process

ACTION

SEE

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- First year students course advisement:
 - Molecular Biology Linda Bazilian (AHF 107D, x11088)
 - Computational Biology Prof. Michael Waterman (MCB 403E, x02408)
- After your first semester, a registration notice will appear in your mailbox.
- For “D” clearance, fill out the request form at <http://bioweb2.usc.edu/misc/dclear.php> . You must include your student ID number and five digit course number.
- Register via WebRegistration (follow directions in the *Schedule of Classes*).
- Pay all necessary fees shown on fee bill by deadline.
- Pick up your ID card from USCard services (Commons Lobby).
- Get validation sticker for ID card from the section office.

If you have any problems with your fee bill, please see Linda Bazilian.

Registration Directory

Registration Packets Enrollment & Drop/Add	Registration Building, 1 st Floor (REG)
American Language Institute	ALI Office (HSS)
Office of International Services	Student Union, 3 rd Floor (STU)
USCard	Commons Lobby (COM)
Health Insurance	Student Health Center (SHC)
Housing/Dining Services	Parking Structure X (PSX)
Financial Aid	John Hubbard Hall (JHH)
Parking Permits/Ridesharing	Transportation Services (CWO)

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Payment of Fees/Cashier's Office

King Hall, 2nd Floor (KOH)

Student Health and Insurance

All Teaching Assistants and Research Assistants will have the student health center fee and student health insurance fee paid by the University. You should enroll in the USC health plan for coverage. Enrollment deadline for health insurance is September 8, 2006.

Please see http://www.usc.edu/student-affairs/Health_Center/ins.index.shtml for more information on the USC Student Health Insurance Plan, including enrollment forms.

Student Health Center

The Student Health Center provides the following services: primary care, basic emergency care, an urgent care clinic, Saturday clinics, specialist clinics, and a pharmacy. You are eligible to use the Health Center as long as you are enrolled in classes and a Health Center fee is listed on your fee bill. If you are not enrolled in classes (i.e., during summer semester) you must pay the appropriate fee for use of the Health Center.

If you are eligible, most care is free. There are nominal charges for some lab tests, prescriptions, orthopedic appliances, and copies of medical records. Should you have questions, call 740-8742.

Dental Care

Your Health Center fee covers dental care. Please see http://www.usc.edu/student-affairs/Health_Center/docs/2006.dental.plan.guide.pdf for a detailed brochure and enrollment form.

General Information about Financial Aid

It is the intention of the Molecular and Computational Biology Section to provide or arrange for the provision of financial support (stipend + tuition) for all of our Ph.D. students. Students should feel assured that the faculty will do everything possible to meet this goal. Please note that Graduate School rules prohibit full time students from accepting any employment above and beyond their graduate assistantships (see Graduate Assistantship Handbook). There are 4 main sources of support for graduate students: Teaching Assistantships, Research Assistantships, Training Grants, and Individual Fellowships and Grants.

1) Teaching Assistantships

We are fortunate to be part of a large undergraduate department, because this gives us access to many TAs. The exact number varies with enrollments, but is divided equally between the 3 research sections. TAs, which are generally awarded each semester, carry a stipend and full tuition remission. You must maintain at least a 3.0 GPA to receive the tuition remission. Nine monthly payments are made beginning September 26 and ending May 26. It is possible to arrange for payments to begin August 26 (for a total of ten payments). See Linda Bazilian for more information. The authority to offer TAs rests exclusively with the Department Chair, who consults extensively with the Graduate Committees of each of the sections, and with faculty instructors.

The workload associated with TAs is quite variable, depending on the course in question and the familiarity of the TA with the subject matter. Consult more senior graduate students for tips on course selection. Keep in mind that the best way to learn a subject in detail is to attempt to teach it to someone else. Whatever course you are assigned, you must take your responsibilities **very seriously**. You are under a moral and legal obligation to do your best for your students. Undergraduates pay a hefty tuition bill, so they are entitled to your best efforts. Learn the subject matter diligently and find creative ways to explain it. Practice your verbal communication skills. Make yourself available and approachable. Conform to high ethical standards and respect the confidentiality of your position. All of these skills will be directly useful to you in your future careers as researchers and educators. Faculty view TAs as an important part of your training. Please be aware that as with any other job, your TA position can be terminated for poor performance. In addition, any TA who behaves dishonestly will be subject to University disciplinary proceedings, which may result in permanent dismissal from the program.

2) Research Assistantships

Research Assistants are paid on the same scale and receive identical benefits as TAs. Formally, the university considers an RA a 15-20 hour per week job **in addition to** dissertation research. Students generally put in more time, however, depending on the relationship between RA duties and the dissertation project. The relation between the RA project and the dissertation project varies depending on the faculty member involved, the area of research, and other considerations. In most cases, the two projects are the same and you will in effect be paid for doing your

dissertation research (this is generally the case for Molecular Biology students). In other cases, efforts are made to keep the projects different. These different approaches reflect the standards of different disciplines in the department

Molecular Biology students will identify their interests and potential advisors during the laboratory rotations they perform in their first year. Determine which professor best matches your interests. Educate yourself about that professor's work and the field in general. Tell the professor you would like to work with him or her and inquire about the availability of RAships. Not every professor will necessarily have an RAship or space in their research program for every student who wants to work for them. Before you start an RAship, be sure you understand what is expected of you, what you can expect from the professor, and what relations might exist between your work and dissertation research.

TAs vs. RAships: Your teaching assistant experience can be very rewarding. You will learn a great deal and have the satisfaction of seeing that knowledge take root in others. You may establish lasting friendships or mentor relationships with some of your students. On the other hand, you are here primarily to do research, not teach. If you are not very efficient in organizing your time, progress on your dissertation research may be slowed by extended service as a TA. Most agree that RAships are preferable but flexibility is key. As grant budgets wax and wane, it may be necessary for RAs to take TAs.

3) **Training Grants**

The National Institutes for Health (NIH) sponsors pre- and post-doctoral training grants (commonly referred to as Institutional National Research Services Awards). Currently the Molecular and Computational Biology program does not hold one of these awards, although we are applying in conjunction with other departments on campus. However, MCB students may be eligible to apply for slots on other training grants including the GMCB program housed at the Keck School of Medicine. Consult your advisor to see if you qualify.

4) **Individual Fellowships and Grants**

There are an enormous number of grants and financial aid available to students. Detailed information can be obtained from two sources. First, the Graduate School (GFS 315, x09033) has a partial listing of available grants. Second, there is a computerized database in Doheny Library (DHL reference section). This database contains literally hundreds of grants or fellowships to choose from.

5) **Summer Support**

Your decision to be a Ph.D. student is a year-round commitment. You should view the summer as an opportunity to engage intensively in research, free from the distractions of coursework, TA assignments, and the like. We expect you to be in the laboratories, engaged in full time research, every summer. We will do everything we can to provide the financial support to make this possible. Please be aware, however, that it is your responsibility to take the initiative in securing summer positions. Early in the spring semester, if not earlier, every new student should make at

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least a tentative decision about which laboratory to work in. Talk to that professor and see if support is available. The best plan would be to secure an RAship, although there are a small number of summer TAships available. These provide only partial support and you must apply early to Linda Bazilian. If these possibilities don't work out, see one of the Graduate Advisors or the Section Director. They may be aware of other avenues for summer funding.

Graduate Student Payroll Information – US Citizens

New TA's and RA's:

I-9 Documentation Requirements

- See Adolfo de la Rosa (AHF 107E) for payroll form and Award Letter to be taken to I-9 personnel. If you are unable to see him ahead of time, he will hand out this information at Lab Safety Training on Friday, August 18.
- Go to LAS Business Office, PED 130, **ONLY** during I-9 processing hours
I-9 Hours: 9:00 a.m. – 10:30 a.m. *or* 2:30 p.m. – 4:00 p.m.

(Please arrive no later than 30 minutes before the end of a session to allow time for processing paperwork.)

- Tell I-9 staff your payroll title is **“Teaching Assistant”**
- Required Documents:
 - Driver's license **AND** original Social Security Card or birth certificate with same name
 - **OR** -
 - Active or expired U.S. Passport with adult photograph
 - Award Letter

E-mail and Mailing Address Requirements

Your email address and both your local and permanent mailing addresses must be current in the following systems at **ALL** times to ensure that checks are issued correctly:

- OASIS – Go to <https://camel2.usc.edu/OASIS/Login.aspx>
You will be asked to enter the following information:
 - Students ID: 10-digit ID #
 - PIN: 6-digit Birthdate (mmddyy)Contact Linda Bazilian or Megan Linford if you don't know your student ID#.
- E-Trac – Once you are “active” in USC Payroll, go to <http://www.usc.edu/etrac> to update your information.

Other Important Payroll Notes:

- You must enroll by the registration deadline.
- The payroll system runs in conjunction with E-Trac. Therefore it is important to verify that your information is correct in the E-Trac system.
- RA's will be paid through their PI's Department. TA's will be paid by the department running the course. Department personnel will contact you when they receive your first “live” check.
- If you would like direct deposit for your next paycheck, please fill out a form in the Business Office.

Graduate Student Payroll Information – US Citizens

New Fellowship Holders:

- You must enroll in classes by August 10th to be paid by August 26th.
- Your first check will go to the “Local” address listed on the OASIS system. Please make sure that it is your current local address.
- If you would like direct deposit for your next paycheck, please fill out a form in the Business Office.
- Your email address and **both** your local and permanent mailing addresses must be current in the following systems at ALL times to ensure that checks are issued correctly:
 - OASIS – Go to <https://camel2.usc.edu/OASIS/Login.aspx>
You will be asked to enter the following information:
 - Students ID: 10-digit ID #
 - PIN: 6-digit Birthdate (mmddyy)Contact Linda Bazilian or Megan Linford if you don't know your student ID#.
 - E-Trac – Once you are “active” in USC Payroll, go to <http://www.usc.edu/etrac> to update your information.

Graduate Student Payroll Information – International Students

New TA's and RA's:

I-9 Documentation Processing

- Go to LAS Business Office, PED 130, **ONLY** during I-9 processing hours
- I-9 Hours: 9:00 a.m. – 10:30 a.m. *or* 2:30 p.m. – 4:00 p.m.

(Please arrive no later than 30 minutes before the end of a session to allow time for processing paperwork.)

- Tell I-9 staff your payroll title is **“Teaching Assistant”**
- Required Documents:
 - Visa Documents
 - Passport
 - I-94
 - "Document Processing Receipt" and a "Social Security Letter Receipt" from OIS
 - Award Letter (See “other important payroll notes” below.)

E-mail and Mailing Address Requirements

Your email address and **both** your local and permanent mailing addresses must be current in the following systems at **ALL** times to ensure that checks are issued correctly:

- OASIS – Go to <https://camel2.usc.edu/OASIS/Login.aspx>
You will be asked to enter the following information:
 - Students ID: 10-digit ID #
 - PIN: 6-digit Birthdate (mmddy)Contact Linda Bazilian or Megan Linford if you don't know your student ID#.
- E-Trac – Once you are “active” in USC Payroll, go to <http://www.usc.edu/etrac> to update your information.
- Other Important Payroll Notes: See Adolfo de la Rosa, AHF 107E, for payroll form and Award Letter to be taken to I-9 personnel. If you are unable to see him ahead of time, he will hand out this information at Lab Safety Training on Friday, August 18.
- As soon as you receive your social security card, bring the original card to LAS Business Office during I-9 hours. This is required for your October paycheck.
- You must enroll by the registration deadline.
- The payroll system runs in conjunction with E-Trac. Therefore it is important to verify that your information is correct in the E-Trac system.
- RA's will be paid through their PI's Department. TA's will be paid by the department running the course. Department personnel will contact you when they receive your first “live” check.
- If you would like direct deposit for your next paycheck, please fill out a form in the Business Office.

Graduate Student Payroll Information – International Students

New Fellowship Holders:

I-9 Documentation Processing

- Go to LAS Business Office, PED 130, **ONLY** during I-9 processing hours
- I-9 Hours: 9:00 a.m. – 10:30 a.m. *or* 2:30 p.m. – 4:00 p.m.

(Please arrive no later than 30 minutes before the end of a session to allow time for processing paperwork.)

- Tell I-9 staff your payroll title is **“Fellowship Holder”**
- Required Documents:
 - Visa Documents
 - Passport
 - I-94
 - "Document Processing Receipt" and a "Social Security Letter Receipt" from OIS
- Complete W-8BEN form when you go to the Business Office to process your I-9 documentation.

E-mail and Mailing Address Requirements

Your email address and **both** your local and permanent mailing addresses must be current in the following systems at **ALL** times to ensure that checks are issued correctly:

- OASIS – Go to <https://camel2.usc.edu/OASIS/Login.aspx>
You will be asked to enter the following information:
 - Students ID: 10-digit ID #
 - PIN: 6-digit Birthdate (mmddy)Contact Linda Bazilian or Megan Linford if you don't know your student ID#.
- E-Trac – Once you are “active” in USC Payroll, go to <http://www.usc.edu/etrac> to update your information.

Other Important Payroll Notes:

- You must enroll in classes by 8/10 to be paid by 8/26.
- Your first check will go to the “Local” address listed on the OASIS system. Make sure to put a correct local address in the system.
- Please note that international fellowship holders are not eligible to receive direct deposit.

Procedures for the Graduate Programs in Molecular and Computational Biology

There are two Ph.D. programs in the Molecular and Computational Biology Department: Molecular Biology and Computational Biology and Bioinformatics.

Requirements for the Ph.D. in Molecular Biology:

- A. Course Requirements: A minimum of **24** of the **60** units required for the Ph.D. degree must be in course work, exclusive of dissertation research. These must include the core courses, **BISC 502a** (4 units) and **BISC 502b** (4 units), to be completed within the first year with no less than a "B" (3.0) grade point average (GPA). Additionally, students will register for **BISC 504L** (3 units) and **BISC 790** (4 units) for laboratory rotations. An additional 4-unit Graduate Committee approved course will be taken during the second year. This course will be chosen in consultation with your advisor. The remainder of the coursework is chosen from the graduate offerings of this and other departments in consultation with the student's advisor. Participation in MolCompBio Lunch and the research seminar series (**BISC 542**, Journal Club) is required for the first three years, and encouraged for the student's entire graduate career.

Registration for first-year students is the following:

<i>Fall Semester</i>		<i>Spring Semester</i>	
BISC 502A	4 units	BISC 502B	4 units
BISC 542	1 unit	BISC 542	1 unit
BISC 790	4 units	BISC 790	4 units
BISC 504L	3 units	BISC 504L	3 units

Ethics Course: We expect the highest level of ethical behavior from our students. Please carefully read the appendix by Dr. Waterman. As part of their training, students are required to take a seminar in research ethics within their first three years. Currently, there are two ways to fulfill this requirement. The first is the two-session seminar taught by Dean Michael Quick as part of the Center for Excellence in Teaching (CET). The other option is to take the summer seminar INTD500 at the Keck School of Medicine. Both of these options provide students with a letter of completion at the end of the course. A copy of this letter must be provided to Megan Linford in the section office to be placed in your permanent file. Please see the enclosed flyer for more information.

Academic Probation: Students with a GPA of less than 3.0 will be placed on academic probation. This can occur at the end of any semester. At the discretion of the Graduate Committee, a student may be allowed a **maximum of three (3) semesters** from the date of entry into the program in which to meet the minimum 3.0 GPA. The graduate committee will decide on the status of a student on probation. There will be no appeal of their decision to the faculty as a whole. The committee will ask a student on probation to take a specific course selected to fulfill a role similar to the core courses to recover from probation. If, at the completion of that course, the "core course" GPA and overall GPA is not 3.0 or above, the student will be dismissed

from the program. See the section on Academic Performance and Evaluation for more detailed information.

Limitations of Registration: Students may register for courses outside of required biology courses but **only with the written approval of their advisor**. Students registering for additional courses without prior approval will be required to drop them. Once a student has passed the qualifying examination, they will register for Dissertation units only, unless the advisor agrees to additional courses.

Limitations of Degrees: Students accepted into the Ph.D. Program in Molecular Biology are not allowed to pursue another degree at the University without *written approval* of their advisor. If a student applies to and is admitted to another program without the consent of their advisor, they may be dismissed from the program.

Teaching Experience: Many of our students will go on to academic positions. Therefore, experience in teaching is considered to be an important part of your training. **Students who do not TA during their first year are expected to TA for at least two semesters later on; at least one of these should be in the 2nd or 3rd year.** The timing should be chosen in consultation with the advisor. During the semester in which students TA, they will receive TA support as described previously. However, they are expected to continue with their dissertation research.

B. Laboratory Rotations
(1st Year)

1. The choice of a research area and a faculty supervisor is the major decision made by a graduate student. To assist in this process, as well as to introduce individuals to the nature of basic research, the Molecular Biology program requires graduate students to spend approximately **eight weeks** for each laboratory rotation.

Students will rotate in each of **three** different faculty research laboratories during their first year. During rotations the student should receive some knowledge of the background of the research area, get some ideas for potential thesis projects, and be introduced to the technology involved, including "hands on" experience in the laboratory. Laboratory rotations are limited to members of the Molecular and Computational Biology Graduate Program (see faculty list in "Directories"), except under special circumstances.

2. Rotations will be assigned on the basis of student requests and available space. Students may request rotations with particular faculty after a series of introductory research talks given during the first weeks of the Fall Semester. Faculty who are presenting have agreed to take rotation students.
3. Rotation performance is the basis of **BISC 504** (3 units) and **BISC 790** (4 units) credit/no credit grades given by the graduate program chairman. For each rotation, the rotation supervisor

must file the appropriate approval form. Satisfactory progress in rotations is an essential component of normal academic progress during the first year.

C. Selection of Dissertation Research Supervisor

(1st Year - must be completed by the end of spring semester)

1. The Dissertation Research Supervisor must be a member of the Molecular and Computational Biology Graduate Program. Regular faculty members and affiliate faculty members approved by the Graduate School are eligible to chair thesis committees.
2. The thesis work is to be carried out primarily in the laboratory of the thesis advisor.
3. In cases where an adjunct faculty member supervises thesis research, that person will be co-chair with a tenured regular faculty member sharing responsibility.
4. Both the student and the Chair retain the right to terminate the advisor/advisee arrangement at any time upon consultation with the Graduate Program director.

D. Written Qualifying Examination

(Summer between the 1st and 2nd year, must be passed during the 2nd year)

1. The Written Qualifying Examination is the first testing procedure prior to a graduate student being advanced to candidacy for the doctoral degree. It is designed to test three aspects of the student's preparation: 1) general knowledge of molecular and computational biology and related fields 2) detailed knowledge of a particular area and 3) the ability to design a basic research project independently, including an awareness of the literature in the field, the technologies available, the potential problems, and the interpretation and significance of the findings.
2. The Written Qualifying Examination will be given to all students during the summer between their first and 2nd year. The questions will be prepared by a faculty committee appointed by the Graduate Program chair and will be based on material covered in an assigned reading list. The entire committee grades the examination. They will then arrive at a pass/no pass decision. Only if the written section has been passed may a student start their Screening Procedure and take the oral examination.

E. Guidance Committee Selection

1. Following successful completion of the Written Qualifying Examination, you must select your Guidance Committee. Students must turn in the signed "Appointment of Committee" form to Linda Bazilian in order for the USC College to approve the committee.
2. The Guidance Committee must have at least five (5) members.
3. At least four (4) members must be Molecular and Computational Biology faculty or

affiliates of the graduate program (at least one tenured). If the student's Ph.D. mentor does not hold his/her primary appointment in Molecular and Computational Biology, she/he will be considered to be one of the 3-4 Departmental members of the student's committee. In this instance, at least two of the other committee members must have his or her primary appointment in Molecular and Computational Biology. The outside member represents the Graduate School and must be a tenured or tenure track faculty from outside Biological Sciences. To qualify as an "outside member", the committee member so designated may not hold a faculty appointment in a department in which the Ph.D. mentor also holds an appointment.

4. The student, in consultation with their Thesis Advisor, chooses the committee.
5. The Guidance Committee should be established within one (1) month after completion of the written qualifying examination and two semesters before taking the qualifying exam.

F. Screening Procedure

(2nd Year, must be passed by 3rd Year/1st Semester)

1. Prior to the Screening Procedure, students should pick up the "Request to Take Qualifying Examination" form from Linda Bazilian. Complete the form and provide it to your committee members at the Screening Procedure.
2. The Molecular Biology Screening Procedure consists of a meeting of the student with the Advisor and one member of the Guidance Committee for the purpose of detecting any deficiencies in the student's academic background, which need to be remedied prior to the Qualifying Examination.
3. The Screening Procedure must be fulfilled following the written qualifying examination and before the oral qualifying examination. If deficiencies are noted, the student will be requested to take course work or independent study to make up for these deficiencies and to schedule a second meeting in the following semester. Failure to correct the deficiencies by the second screening procedure is grounds for dismissal from the program.
4. The student must provide the entire committee with:
 - a. A list of graduate courses taken **at other institutions** and grades awarded (student can see Linda Bazilian for this information)
 - b. A one-page outline of proposed thesis research (for approval)
 - c. A one-page outline of the research proposal to be prepared for the qualifying examination (for approval).
5. The Committee Chair will bring the student's complete file to the meeting and will prepare a brief report of the procedure for the student's file.
6. Upon successful completion, student should return the signed "Request to Take Qualifying Examination" form to Linda Bazilian.

G. Oral Qualifying Examination

1. The oral examination will consist of both general questions and the presentation and defense of a proposal outlining a research project, which must be in a field other than that of the student's dissertation research interest.
2. The student must schedule the oral examination within 60 days of the screening procedure. **At least** ten days prior to the date of the oral examination, the student will present the guidance committee with a typed research proposal consisting of: title, a brief description of the hypothesis to be tested, the body of the proposal (**not to exceed 10 pages including figures and references**) and appropriate references. Follow the proposal format of the NIH Postdoctoral Proposals. (See Appendix 2.) This proposal must be in a subject area outside the field of the student's thesis research and outside any field of research ongoing in the laboratory of the student's mentor. Failure to comply within the time limit or the format may be grounds for failure of the examination. If the qualifying examination is not passed the committee will inform the student as to whether and under what conditions the examination may be retaken. Satisfactory completion of both the oral presentation and the written proposal are required for advancement to candidacy.
3. Upon successful completion of the Oral Qualifying Examination, the student may select the Dissertation Committee. This is generally composed of the same members as the Qualifying Examination Committee but can be reduced to four members.

H. Doctoral Dissertation

Upon successful completion of the Qualifying Examination, the student is admitted to candidacy for the Ph.D. The student *must* register for BISC 794 (Doctoral Dissertation) during every semester in residence until completion of defense and must register for these courses in order (A,B,C,D,Z). Students are expected to meet with their thesis committee each year. The first meeting after the Oral Examination should be a formal proposal of the thesis topic. Failure to meet with the committee each year will result in a hold being placed on registration. Suitable progress in thesis research must be demonstrated at each meeting to maintain good standing in the program.

I. Defense of the Dissertation

The defense of the dissertation will be either a defense oral (defense of the rough draft of the thesis) or a final oral (defense of the final draft of the thesis). In most cases a defense oral will suffice if approved by the dissertation committee in the required pre-defense meeting. The oral defense will consist of a public seminar. The student must register for 2 units of **BISC 794** in the semester that the defense is planned (except during summer session) and submit the title and date of the defense to the Graduate School **no later than** thirty days prior to the defense. A copy of the thesis must be provided to committee members a **minimum** of two weeks before the defense, to allow for thorough reading. **Please note:** The Department will provide 3 bound copies of the thesis for the student at no charge to the student. One copy is for the student, one

for the thesis adviser, and one for the department. Please see Megan Linford for details.

Additional information about requirements of the program can be found in the University of Southern California Catalogue.

Many of the forms listed above can also be downloaded at the Graduate School's website: <http://www.usc.edu/dept/GRADSCHL/downloadstudents.html> . Please also note that the "Current Students" section of the Graduate School's website contains valuable information regarding policies, procedures and deadlines.

Information contained in this section serves as a guide and is subject to change as we continue to improve the educational experience of our Ph.D. candidates.

Requirements for the Ph.D. in Computational Biology and Bioinformatics:

- A. Course Requirements: The students must complete, with a "B" average, a minimum of 60 units of courses carrying graduate credit and approved by the guidance committee. The required courses include: BISC 502a, BISC 542, CSCI 570, MATH 505a, MATH 541a, MATH 578ab, MATH 650. An additional 6 units of elective courses will be taken in consultation with the student's advisor. Students must register for a minimum of 4 units of dissertation research (BISC 794ab). Students must be registered in BISC 542 (Computational Section) their first 3 years in the program (6 semesters).

A sample course list for the first three semesters of study:

1st Year - Fall

Math 505A
CSCI 570
BISC 542
BISC 502A or BISC 320

1st Year - Spring

Math 578A
Math 541A
Math 577A
BISC 542

2nd Year - Fall

Math 578B
Math 541B
Math 650
BISC 542

- B. Screening Procedure

The screening examination should be taken by the end of the third semester in the program. If the student fails the examination, the department, at its discretion, may permit the student to take it again during the next semester. The screening examination consists of written examinations on topics including molecular biology, mathematical probability and statistics.

- C. Oral Qualifying Examination

The qualifying examination should be taken within two semesters following successful completion of the screening examination.

The written portion of the qualifying examination consists of a dissertation proposal. This document should include: introduction, statement of the problem, literature survey, methodology, summary of preliminary results, proposed research, references, appendix (including one or two fundamental references).

The oral portion of the qualifying examination consists of presentation of the Ph.D. dissertation proposal. The student must demonstrate research potential.

- D. Transfer of Credit

No transfer of credit will be considered until the screening examination is passed. A maximum of 30 units of graduate work at another institution may be applied toward the course requirements for the Ph.D. A grade of B- (A = 4.0) or lower will not be accepted and, at most, two grades of B will be accepted. A Ph.D. candidate may petition the department for transfer of

additional credit, after he or she passes the qualifying examination.

E. Dissertation

Following passage of the screening examination and approval of a dissertation proposal by the guidance committee, the student begins research toward the dissertation under the supervision of the dissertation committee. The primary requirement of the Ph.D. is an acceptable dissertation based on a substantial amount of original research conducted by the student.

Academic performance and evaluation

The University and the Molecular and Computational Biology Program expect that all our students will demonstrate both academic proficiency and research accomplishment. To ensure appropriate progress, the appropriate graduate committee will review the performance of all students at least once a year (twice for 1st year students). Progress will be rated as **excellent**, **satisfactory**, or **unsatisfactory**. One unsatisfactory rating will result in a letter of warning to the student. Two unsatisfactory ratings may lead to dismissal from the program at the discretion of the graduate committee.

GPA: Students who fall below the required GPA have failed to demonstrate minimal qualification for the program. At the end of the first year, students who do not have a minimal 3.0 GPA may be terminated at the discretion of the graduate committee. Students with sub-3.0 GPAs may be allowed to continue in the program, but only if they have exceptional research performance, compelling faculty support and evidence that they are otherwise qualified. Such students are formally on academic probation and are considered provisional.

Teaching qualification: International (foreign) students are required to pass language exams to qualify them for teaching. As stated in the offer letter, this is required for entry into the program. Students who do NOT pass the English exam may be allowed to stay for one semester **only if** RA funding can be found, but they will have an unsatisfactory rating. Students who fail the exam a second time will be given an automatic second unsatisfactory rating and will be dismissed from the program. The only exception is for students who are accepted into a laboratory full time as a “direct admit”.

Evaluation in the Molecular Biology Program

1st year: Performance will be evaluated each semester based on scholarship (GPA), and rotation evaluations. Students admitted on TAs are expected to perform their duties to the satisfaction of the teaching faculty. Students who fail to perform in BISC502a/b or do not show outstanding scientific progress will receive a written warning after the first semester. If the situation does not improve, or if the student fails to find a sponsoring laboratory, the student may be dismissed from the program after the spring semester. BISC502a/b now serves as the preliminary screen for qualifying exams. Students who do not perform well in BISC502a/b generally will not be considered eligible for these exams, nor qualified to continue.

2nd year: Performance will be evaluated based on GPA, laboratory evaluation, and written qualifying exam (taken during the summer after the 1st year). Students who do not pass the written qualifying exam may be offered the opportunity of remediation at the discretion of the graduate committee. However, this is only allowed if the score was close, the GPA is satisfactory and there is strong support from the student's mentor. Students who fail the qualifying exam and have a significantly sub-3.0 GPA have generally not demonstrated sufficient academic proficiency to continue in the program or to earn a degree and will be dismissed.

3rd year: Performance will be evaluated based on GPA, laboratory evaluation, dissertation proposal, and committee meetings (first regular committee meeting should be a presentation of the dissertation). Oral exams should be completed before fall semester of the 3rd year. Students who do not complete their oral qualifying exam in a timely fashion may have a hold placed on their registration. Any students still on academic probation must bring their GPA to the required 3.0 level by the end of the 3rd year. (This should only apply to a few students grandfathered before this policy took place).

Senior students: The thesis committee and advisor must report on the student's progress each year. It is strongly recommended that any problems be identified to the graduate committee so that they can be dealt with promptly. Students in their 4th or 5th year should demonstrate substantial scientific accomplishment and be on the road to independence. We hope that students will complete their degree within 5-6 years.

Master's degree: Students who pass written and oral exams but decide to leave the program may apply for a Master's Degree. The M.S. will generally NOT be recommended for ongoing students, and will not be offered to students who are unable to pass the appropriate exams demonstrating proficiency in molecular biology.

Evaluation in the Computational Biology Program

First 1.5 Years. Performance will be evaluated each semester based on scholarship (GPA). Students admitted on TAs are expected to perform their duties to the satisfaction of the teaching faculty. Until the screening exam, the student's program is under the direction of an initial guidance committee composed of members of the admissions committee. Performance will be evaluated each semester based on course grades and on progress with the required courses (BISC 502a, CSCI 570, MATH 505a, MATH 541a, MATH 578ab, and MATH 650), which the student should complete by the time of the screening exam.

Screening Exam. The screening examination should be taken at the end of the third semester in the program. The screening examination consists of three written examinations on the topics of molecular biology, probability and statistics, and algorithms. If the student fails more than one exam, they will usually be dismissed from the program. If the student fails one exam, that exam can, with the consultation of the guidance committee, be retaken the next year.

Qualifying Examination. The qualifying examination should be taken within two semesters following successful completion of the screening examination. Requirements for the written portion and the oral portion are described in the USC Catalogue. The student must demonstrate research potential.

Each Succeeding Year. The guidance committee will meet and consider the student's progress toward a thesis as well as evaluate the course work.

ETHICAL BEHAVIOR

It should be obvious that we expect the highest level of ethical behavior and academic integrity from our students, as well as from our staff and faculty. **Plagiarism, academic dishonesty, research dishonesty, teaching dishonesty, and any scientific misconduct are all grounds for dismissal from our program.** Students should read the appendix containing Dr. Waterman's discussion of student ethics, and should also be familiar with the policies of USC (<http://www.usc.edu/student-affairs/SJACS/docs/GradIntegrity.pdf>). Any concerns should be brought to the attention of the student's advisor, or the graduate program director (Susan Forsburg for MB and Fengzhu Sun for CB), or to Myron Goodman, the program chairman.

As described earlier, Molecular Biology students are required to complete a seminar in research ethics within their first three years.

**Timeline to Degree
for the
Ph.D. in Molecular Biology**

1. **1st Year** Completion of two required core courses (BISC 502a/b) with 3.0 grade point average.
2. **1st Year** Successful completion of rotations in three laboratories.
3. **1st Year** Selection of a Dissertation Research Supervisor by end of the spring semester.
4. **1st/2nd Year** Written Qualifying Examination taken during summer between 1st and 2nd year.
5. **2nd Year** Initiation of thesis research by the first summer, or the first semester of the second year at the latest.
6. **2nd Year** Selection of Guidance Committee (following successful completion of the Written Qualifying Examination).
7. **2nd Year** Completion of 3rd course (in consultation with your advisor).
8. **2nd/3rd Year** Screening Procedure; must pass by end of first semester of third year.
9. **3rd Year** Complete Oral Qualifying Examination by end of third year.
10. Submission and oral defense of a Thesis acceptable to Dissertation Committee and The Graduate School.
11. Delivery of a dissertation defense seminar to the Molecular and Computational Biology faculty and students, which will be open to the scientific community.

**Timeline to Degree
for the
Ph.D. in Computational Biology and Bioinformatics**

1. **1st Year** Completion of courses with minimum 3.0 grade point average.
2. **2nd Year** End of first semester: Complete Screening Examination.
3. **2nd Year** Completion of courses with minimum 3.0 grade point average.
4. **3rd Year** End of first semester: Complete Qualifying Examination.
5. Submission and oral defense of a Thesis acceptable to Dissertation Committee and The Graduate School.
6. Delivery of a dissertation defense seminar to the Molecular and Computational Biology faculty and students, which will be open to the scientific community.

Los Angeles Life

Housing

On-Campus: The USC Student Housing Office (x02546) is in Parking Structure X.

Off-Campus:

Most graduate students choose to live off-campus. The major Los Angeles newspaper (*The LA Times*) as well as smaller community newspapers (*Hollywood Press*, *Santa Monica Evening Outlook*, *The Daily Breeze* - Redondo-Hermosa-Manhattan Beach areas, *Star News* - Pasadena area, *Northeast Newspaper* - Eagle Rock, El Sereno, East Los Angeles area) have listings for apartments and houses for rent. You can also check listings in the student newspaper (*The Daily Trojan*). There is a classified advertising paper (*The Recycler*) that has many listings. You may wish to simply walk around a neighborhood you like and look for vacancy signs.

Before you begin your off-campus search for housing there is one very important purchase you should consider making - a *Thomas Brothers Street Atlas of Los Angeles and Orange Counties*. These are available at the USC Bookstore (next to the Commons) or at most bookstores in the Los Angeles area. With the *Thomas Guide* you will be able to locate any street address in LA and Orange counties quickly and easily.

Non-University housing near the USC campus is limited and therefore fills up early. In addition, some areas close to campus can be unsafe. In general, you may want to avoid the area south of campus (near the stadium, Sports Arena, etc.). The area north of campus, known as North University Park, is considered to be a safe area. Because the area is small, availability is limited and landlords are able to charge more, making it difficult to find a bargain. However, there are a number of older places that are not too expensive and entirely livable. These must be sought out early, but try anyway - you might be lucky. One advantage of living in this area is that you can easily walk or bike to campus.

A word to the wise regarding safety: you should never walk around campus alone late at night. If you are working late in the lab, call the USC Campus Cruiser Service (see below) for a pick-up at the building entrance.

Transportation and Parking

The transportation system in Los Angeles is called the Metropolitan Transit Authority (MTA). The phone number for MTA information is 1.800.COMMUTE (266.6883). There is excellent express bus service from several cities into the downtown area. Some routes include stops right at or near USC. You can usually get between any two places in the L.A. area by bus, but one or two transfers may be required. The fare is \$1.25, plus 25 cents per transfer. Los Angeles also has a subway and rail transit system. The "Blue Line" runs between Long Beach and L.A., the "Red Line" runs from downtown L.A. to the center of Hollywood and the "Gold Line" runs from downtown through Pasadena to Sierra Madre. Monthly discounted MTA passes are available and may be purchased from USC Transportation Services.

USC operates both a Tram Service and a Campus Cruiser Service. The tram service provides service to the housing areas off campus, to the Health Sciences Campus, Union Station, and to campus parking lots Monday through Friday. You can also call the Campus Cruiser Service to transport you to locations within approximately one mile from the center of campus (including the off campus housing area). If you are working late at night in the lab, it is a good idea to call Campus Cruisers (x04911) rather than walk to the parking structure alone. See *SCampus* for information and schedules.

If you live close to campus you may want to commute by bicycle. Keep in mind, however, that the traffic in stolen bikes near USC is very high, so take all necessary precautions. Don't park your bike outside unlocked, keep it in your apartment and, while you are at school, keep it in your office/lab. Bicycles must be licensed - see procedures in *SCampus*.

If you commute by car you would be wise to invest in a USC Parking Permit, which will entitle you to park in designated areas on campus. You can buy a parking permit from the Transportation Services Office, located at 1012 Childs Way (CWO). There is off-campus street parking but it is scarce and not very safe. There are also time restrictions for street parking - be sure to read the posted signs before you leave your car. Regardless of where you park, you should always lock your car and make certain that you **leave nothing of value** (CD's, books, clothes, tennis rackets, etc.) where it can be seen from the outside of the car.

Los Angeles County sponsors a service called "Commuter Computer" which is designed to help commuters form car pools. If you would like to car pool and are having trouble finding partners you can submit your name and commuting schedule to the "Commuter Computer" (213/380-RIDE), and it will attempt to match you up with other people who have similar commuting needs. You can also find out about ridesharing in the Transportation Services office (x03575).

All information concerning transportation services (parking, ridesharing, etc.) can be found at the transportation services website: <http://www.usc.edu/transportation>.

Culture and Recreation

Los Angeles has an abundance of cultural and recreational activities. There is something for everyone, from amusement parks (Disneyland, Magic Mountain, Knott's Berry Farm) to art museums (LA County, J. Paul Getty, Norton Simon, MOCA - Museum of Contemporary Art, Huntington Library and Art Gallery); from classical music (LA Philharmonic at both the Music Center and Hollywood Bowl) to contemporary (Greek Theater, Universal Amphitheater); from classic theater and musicals (Kodak, Ahmanson, Pantages) to first-run contemporary works (Mark Taper Forum, any of the many local smaller theaters); from zoos (LA, San Diego) to aquariums (Long Beach, Sea World); and horse racing (Hollywood Park, Santa Anita Park) to pro sports (LA Dodgers, Kings, Lakers, Clippers, Angels). The LA County Museum of Natural History, the LA County Museum of Science and Industry, the ScienCenter and 3D-IMAX theater, and the California Afro-American Museum are just south of campus in Exposition Park. For a unique experience, visit the Page Museum and La Brea Tar Pits next to the LA County Museum of Art on Wilshire. In many instances students are entitled to discounts at these venues. You must have a student ID with a current registration sticker. A few ways to learn

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about what's going on: the *New Times* and the *LA Weekly* are free and usually available each Thursday afternoon outside the Topping Student Center; also check the Calendar section of the Sunday *Los Angeles Times* and *Los Angeles Magazine*.

Recreational facilities in the Los Angeles area are superior. There are beaches, parks, golf courses and tennis courts and the mountains are only an hour away for hiking and skiing.

There's also plenty going on at USC, including plays, musicals, concerts, first-run movies, film retrospectives, and art shows. Most popular, however are the athletic events, especially football games. It may seem intellectually inappropriate to go nuts over football, but USC football games (particularly the UCLA and Notre Dame games) are exciting spectacles that you really should experience at least once. If you enjoy watching college athletics you ought to invest in a "Student Activity Card." These are available during registration week. The Student Activity Card is essentially a season ticket to all home USC athletic events (including all sports). It also guarantees you the opportunity to purchase a Rose Bowl Ticket if USC is selected to play.

Excellent athletic facilities available to students can be found at the Lyon Center (next to the McDonald's Olympic Swim Stadium). Entrance and basic facilities are free to students with current ID. There are several tennis courts, handball and racquetball courts, a weight room, and a track available for student use. Two new swimming pools, adjacent to the Lyon Center were built for diving and swimming events in the 1984 Olympic Games. Biology students can form teams to enter University intramural leagues in a number of sports (e.g., basketball, softball, coed water polo, coed volleyball). If you're interested in participating, watch for notices throughout the section.

Finally, USC maintains a research lab on Santa Catalina Island in Big Fisherman Cove at Two Harbors. You can get there for free on the USC boat, which travels between Catalina and the USC Marine Support Facility in LA Harbor. Call 743-6792 for details.

Banking and Shopping

At the University Village, there is one bank, Bank of America, which offers bankcards as well as checking and savings accounts. If you open a savings account with them, they will cash your personal checks. Automatic teller machines are available there and on campus (near the University Bookstore). NEVER GO ALONE TO AN AUTOMATIC TELLER MACHINE AFTER DARK. Another way to meet your banking needs is the USC Federal Credit Union (KOH 200), which is on campus and offers good deals on checking and savings accounts. The Credit Union currently has three automatic tellers on campus (near the University Bookstore, the Commons Lobby, and Kings Hall).

Books

The University has an excellent bookstore and graduate students with TAs or RAs are entitled to a 10% discount with their ID card. Another good store for books and supplies is "The Paper Clip", next to campus in University Village. They also give a 10% discount.

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Appendix 1: Molecular Biology Qualifying Exam overview

Written exam:

Goal: To assess breadth of general knowledge and ability to synthesize information.

Format: Students are given a reading list with one paper selected by each participating faculty member, 8-12 weeks before the exam. Students will read the papers and obtain necessary background information. Each faculty member will ask one question related to the paper that can be answered in 30 minutes. Students will have a one-day written exam where they must answer 10 of 12 questions (half in the morning, half in the afternoon). The exam is open book and students will have any papers, books, or other background material they choose. However, no internet access is permitted and students are not allowed to bring phones or other electronic devices into the exam. Students generally must have a satisfactory GPA in first year courses to participate in the exam and continue in the program.

Faculty responsibilities: Faculty will choose a paper, write a question, and grade the answers. The question should be answered in 30 minutes. The exam is open book, so you should assume students will have the paper, and probably a relevant review with them. Examples: Students may be asked to explain the logic behind an experiment, or experimental design, or an alternative interpretation of a figure, or alternative models, or general background context.

Grading: Answers will be scored as Satisfactory (S), Unsatisfactory (U), or Failed (F). Two U grades are equivalent to 1 F. Students who receive more than 2 F equivalents have failed the exam. In most cases, this will result in dismissal from the program. In rare cases, remediation may be offered at the discretion of the graduate committee, but only if the student is close to the pass mark, has demonstrated **exemplary** academic and research performance in the previous year, and has strong endorsement from the advisor.

Timing: August of the 1st year, with the reading list assigned by May.

Oral exam:

Goal: To ensure ability to identify a problem, formulate a hypothesis, and test it.

Format: Students choose a committee of 5 faculty members, according to standard policies of The Graduate School. They identify a biological question **unrelated to their thesis research**. Students write the equivalent of a postdoctoral fellowship proposal on this question, in which they establish a hypothesis and the means to test it. Students are allowed to speak to faculty while choosing their topic and during preliminary screening process. They are also encouraged to speak to their other colleagues in a general sense. However, their work must be demonstrably their own.

Topic approval: Students must have two faculty agree that their topic is unrelated to their research before they begin the process. Rule of thumb: different problem, different system.

Preliminary screening: After the topic has been approved, students may begin the screening process. This requires a one page abstract including specific aims, which is provided to the committee for their approval and feedback before the student schedules the oral. This is no longer done in a committee meeting but can be done in private meetings or by email on an individual basis. (**Note: this procedure is undergoing revision.**) All committee members must officially "sign off" on the abstract. Once all committee approve and have made appropriate suggestions, students will schedule their exam. This is a critical stage. If faculty have **any** concerns about the choice of topic or aims of the project the student proposes, the student should be informed at this point so that they can redirect it

appropriately before the oral exam.

Exam: The written proposal will be provided at least one week in advance of the oral examination to the faculty committee. Students will present and defend their proposal in an oral exam. Revisions should be addressed in the written proposal for final committee approval.

Faculty responsibilities: Faculty will serve on committees and respond to the screening abstract promptly with appropriate comments. The students must receive sufficient feedback from the screening abstract to address any glaring problems. Faculty should be prepared to help students in selection of an appropriate topic. Faculty should be prepared to read the screening abstract, the full proposal and any revision in a timely fashion.

Evaluation: Students must demonstrate the ability to think critically and synthesize information. This is a fundamental test of a scientist. While minor revisions may be accommodated by rewriting the written component, serious flaws in the execution of this examination are grounds for dismissal from the program. Note that faculty have a responsibility during the preliminary screening to give the student appropriate guidance in developing the project.

Timing: The oral exam should be held during the 2nd year. Students should complete it by the end of fall semester of the 3rd year. Failure to complete in a timely fashion will result in a hold being placed on registration.

Appendix 2: Written proposal Specifications: (derived from NIH postdoctoral fellowship guidelines)

Overall:

10 pages maximum, including figures and references. You do not have to use your full 10 pages. Type size limitations must be observed throughout the application. The type must be **clear and readily legible**, standard size, which is 10 to 12 points (approximately 1/8 inch in height for capital letters). If constant spacing is used, there should be no more than 15 cpi, whereas proportional spacing should provide an *average* of no more than 15 cpi. Figures, charts, tables, figure legends, and footnotes may be smaller in size, but must be clear and readily legible. Margins are to be 1 inch all around. Pages are to be numbered at the bottom of each page. Figures, diagrams, and tables are to be included in the body of the application.

Research Proposal: This section should be well formulated and presented in sufficient detail that it can be evaluated for scientific merit. The Proposal must be original work composed and written by the student. Any consultation with outside sources should be indicated in the references.

Include sufficient information to permit an effective review without reviewers having to refer to the literature or any previous application. Brevity and clarity in the presentation are considered indicative of an applicant's approach to a research objective and ability to conduct a superior project. Sections (1) through (3) are **not to exceed 10 pages**, single-spaced. Follow the format below:

- (1) **Specific Aims** (1-2 pages)
State the specific purposes of the research proposal and the hypothesis to be tested.
- (2) **Background/Significance** (1-2 pages)
Sketch briefly the background to the proposal. State concisely the importance of the research described in this application by relating the specific aims to broad, long-term objectives.
- (3) **Research Design and Methods** (6-8 pages)
Provide an outline of:
 - Research design and the procedures to be used to accomplish the specific aims;
 - Tentative sequence for the investigation;
 - Statistical procedures by which the data will be analyzed;Potential experimental difficulties should be discussed together with alternative approaches that could achieve the desired aims.

(4) Provide **literature citations** at the end of the research proposal. Each reference must include the title, names of all authors, book or journal, volume number, page numbers, and year of publication. Be concise: you do not have to provide an exhaustive review. Include websites and any personal communications.