

Graduate Program in Biomedical Sciences

University Of California, Riverside

STUDENT AND FACULTY HANDBOOK

Introduction

This handbook is designed to provide you with information that will be helpful to you as a participant in the Biomedical Sciences graduate program at UCR. We hope that you will read it carefully and consult it as needed when you have questions about the program. In addition, please feel free to contact the Graduate Advisors and Graduate Student Affairs Officer for additional information or clarification.

The handbook includes the names and contact information for participants in the program, an overview of the academic objectives and requirements of the program, and time tables for the completion of degree objectives. It also contains information to help orient new students to the campus and it describes special features of our program and campus resources.

Additional information about our Program and Faculty is available at our web site:

<http://biomed.ucr.edu/content/view/83/115/>.

Current Program Officers

Graduate Advisor for Recruitment – **Dr. Katie DeFea** (1116 Webber Hall) is responsible for matters concerning graduate student recruitment and applications.

E-mail: katie.defea@ucr.edu

Phone: 2-2871.

Graduate Advisor for Continuing Students – **Dr. Christian Lytle** (2226 Webber Hall) is responsible for matters concerning all current graduate students.

E-mail: christian.lytle@ucr.edu

Phone: 2-2592

Graduate Student Affairs Officer – **Kathy Redd** (1001 Batchelor Hall) maintains graduate student files and responds to questions regarding graduate student policies and procedures.

E-mail: kathy.redd@ucr.edu

Phone: 2-5621

*The other staff in the **Biological Sciences Graduate Student Affairs Center** (1001 Batchelor Hall) can also assist you when Kathy Redd is not available.*

Financial and Administrative Officer – **Lynn Hice** (Management Services Officer) is the Administrator for the Division of Biomedical Sciences. She is responsible for recruitment and evaluation of staff support personnel, and for major administrative transactions (space requirements, budgets, and other administrative matters). E-mail: lynne.hice@ucr.edu. x2-3219.

Computer Technical Specialist – **Nancy Price** is available for assistance with departmental computers and projectors. E-mail: nancy.price@ucr.edu. Phone: x2-5708.

Purchasing Assistant – **Pam Urry** is available for assistance with all laboratory & departmental purchases and Fed-Ex shipments. She also issues and administers laboratory security codes and processes travel vouchers and campus recharge applications.

E-mail: pam.urry@ucr.edu Phone: x2-4312.

Personnel Specialist – **Violet Vargas** handles personnel and payroll matters and issues keys. E-mail: pam.urry@ucr.edu Phone: x2-4312.

Vivarium

If you need to order, receive, or transport animals, you should work closely with your Vivarium Manager. Strict policies exist within the University with respect to guidelines and standards imposed by the National Institutes of Health (NIH) and the Animal Welfare Act.

Biomedical Sciences Vivarium – Sally Scott is Manager of the Biomedical Sciences Vivarium (Boyce Hall, 6th floor). E-mail: sally.scott@ucr.edu Phone: x2-5319.

Campus Veterinarian – Akiko Sato, DVM, is our campus-wide veterinarian, in charge of overseeing all animal care on campus (215 Univ. Office Bldg). E-mail: akiko.sato@ucr.edu Phone: x2-5845. Web site: <http://vet.ucr.edu/>

Web Pages of Interest

Division of Biomedical Sciences http://biomed.ucr.edu/	Biological Sciences Graduate Student Affairs Center http://www.bioscigrad.ucr.edu/
Graduate Division http://www.graduate.ucr.edu/	Graduate Calendar http://www.graduate.ucr.edu/GDCalendar.pdf
Graduate Student Handbook http://www.graduate.ucr.edu/GSHndbk.pdf	Schedule of Classes http://www.classes.ucr.edu/schedule/
UCR Online Registration (GROWL) https://ucribm.ucr.edu/Paws/PAWS.html	UCR Libraries http://library.ucr.edu/
UCR Housing Office http://www.housing.ucr.edu/	Literature Search (Stanford Highwire Press) http://highwire.stanford.edu/
Biological Sciences Graduate Student Affairs Center http://www.bioscigrad.ucr.edu/	General Catalog On-Line (saves you from buying one at the Bookstore!) http://www.students.ucr.edu/catalog/
City of Riverside (full of useful information about the city and area) http://www.ci.riverside.ca.us/riverside/	Tips on how to succeed in graduate school http://www.cs.indiana.edu/how.2b/how.2b.html

Program of Study

Prerequisites

BCH 110A and 110B (General Biochemistry) **and** **BCH 110C or BIOL 107**

(students may meet this requirement by passing the Biochemistry Placement Examination)

Core Requirements:

1. **BMSC 202** (Molecular Basis of Disease, 3 units, Spring)
 2. **Completion of any *three* Special Topics courses:**
 - BMSC 222** (Special Topics in Biomedical Sciences, 2 units)
 - BCH 230** (Advanced Topics in Biochemistry, 2 units)
 - BIOL 281** (Seminar in Cell Development, Structure & Function, 2 units)
 - NRSC 289** (Special Topics in Neuroscience, 2 units)
 3. **BMSC 252** (General Seminar) Enrollment required each quarter
 4. **BMSC 254** (Graduate Student Seminar) Enrollment required each quarter with presentation of at least one seminar per year
 5. **BMSC 302** (Directed Teaching) One quarter requirement taken when acting as a TA for a class (not required of M.D.-Ph.D. students).
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Elective Requirements:

Completion of any *four* courses from the list on the following page.

**If 100 level units are taken, some adjustments (depending on number) in total units per quarter must be made – see Kathy Redd*

BMSC Graduate Program: Elective Courses

*THBD: "Themes in Human Biology and Disease"

Other courses will likely be offered each quarter; check catalog

Department	Number	Notes	Title	Units	Instructors
FALL QUARTER					
BCH	211		Molecular Biology	3	Gallie/Sauer
BMSC	223-E	~9/12—9/23	THBD: Inflammation, Autoimmunity, & Pathogen Defense	4	Carson
BMSC	223-F	~10/10—10/28	THBD: Cardiovascular Physiology	4	Lytle
BMSC	223-G	~10/31—11/13	THBD: Renal Physiology	3	Quinton
BMSC	223-I	~11/14—12-2	THBD: Respiratory Physiology	3	Quinton
CHM	221-F		Introduction to Bioanalytical Chemistry	3	Larive
CMDB/BIOL	200		Cell Biology	4	Talbot/Haimo/Zidovetzki
ENTX	201		Principles of Toxicology	4	Eastmond
NRSC/PSYC	200A		Fundamentals of Neuroscience	3	Currie
WINTER QUARTER					
BCH	210		Biochemistry of Macromolecules	4	Wing/Johnson
BMSC	223-J	# ~1/3—1/20	THBD: Gastrointestinal Physiology	3	Lytle
BPSC	236		Principles of Light Microscopy	4	DeMason/Carter
CMDB/BIOL	201		Molecular Biology	4	Straus/Sladek
CMDB	206		Gene Silencing	4	Ding/Zhu
CMDB	210	#	Molecular Biology of Human Disease Vectors	3	Raikhel, A
ENTX	202		Mechanisms of Toxicology	4	Gill
GEN	240-A		Advances in Bioinformatics & Genomics	4	Judelson
NRSC/PSYC	200-B		Fundamentals of Neuroscience	3	Hatton
SPRING QUARTER					
BCH	120		General Biochemistry Related to Biomedical Science	4	Henry/Luben
BCH	212		Signal Transduction and Biochemical Regulation	3	Traugh/Liu
CMDB	202		Developmental Biology	4	Maduro and others
CMDB	204		Genome Maintenance and Stability	4	Bachant/Nugent
CMDB	205	even years only	Signal Transduction Pathways in Microbes and Plants	4	Borkovich and others
CMDB	207		Stem Cell Biology	4	Talbot and others
GEN	240-B		Advances in Bioinformatics & Genomics	4	Walling
NRSC/PSYC	200-C		Fundamentals of Neuroscience	3	Currie
Special topics:					
CMDB	281E (BCH 230G)		Glycobiology	2	Nothnagel
CMDB	281E		Cell Biology	2	Haimo
CMDB	281F		Analysis of Gene Microarray	2	Zidovetski

The normative time for completion of the Ph.D. degree requirements is fifteen quarters (5 years). During this time, you will be expected to accomplish three major goals: (1) complete core course work by the end of your first year, (2) prepare a research proposal and pass the Oral Qualifying Examination (advance to candidacy) before the beginning of your third year, and (3) produce and file your dissertation by the end of your fifteenth quarter. All students will continue to participate in graduate seminars, and may take additional coursework, until they graduate.

The following is a guide to achieving these goals:

1. Schedule a meeting with the Graduate Advisor soon after arriving at UCR

The Graduate Advisor will help you design an initial course of study that will: (a) make up any course deficiencies; (b) meet the Program's course requirements; and (c) prepare you for research in your chosen area of specialization. The Graduate Advisor will also assist you in selecting an appropriate **Guidance Committee**, which will consist of your advisor, who will serve as Chair, and two other professors from the program with expertise in your area of interest. It is very important that you select a **Major Professor** within your first three quarters at UCR. The Major Professor provides the financial support, the research facilities, and the intellectual guidance necessary to complete your dissertation. The Major Professor normally serves as the Chair of your Guidance Committee. The Guidance Committee adds expertise, guidance, different opinions, and in some cases protection and support for a student. It is important that you develop easy communication with your committee members and that you ensure, by regular meetings, that everyone is in agreement with your proposed program of study. Students **must** meet at least annually with their Guidance Committee to plan their courses; however, they are encouraged to meet more often than that. Minutes of the meeting, prepared by the Chair, should be approved by the rest of the committee and then placed in the student's file.

2. Begin rotations in labs that interest you.

You are strongly urged to complete at least two, five-week laboratory rotations with BMSC Graduate Program faculty members during your first three quarters at UCR. If you have already chosen a lab for your dissertation work, rotations are not compulsory, but still recommended. These rotations will enable you to become familiar with the research questions and techniques utilized in the lab, and at the same time, allow faculty to become acquainted with you. You should arrange lab rotations with the individual faculty members in consultation with the Graduate Advisor. Before contacting the faculty member with a request for a rotation, read a few recent publications from their lab, and be prepared to explain what aspect of

their research program interests you. Remember, your goal is to earn a position in a lab doing research that matches your interests.

After completing these rotations, you should be ready to choose your Major Professor in whose lab you will conduct your dissertation studies. ***You must identify a Major Professor willing to supervise your studies by the end of the first year in order to remain in the program.***

3. Complete course requirements.

You will complete a series of core courses and an elective curriculum tailored to your own research interests and educational deficits.

You must:

- i) Be enrolled in at least 12 units of graduate academic credit every quarter, or a combination of undergraduate + graduate courses equal to 12 units of graduate credit.
- ii) Maintain a GPA of at least 3.5.
- iii) Be enrolled in BMSC 252 (General Seminal Series) when offered in Biomedical Sciences or in coordination with other departments.
- iv) Be enrolled in the Biomedical Sciences 254 (Graduate Student Seminar Series) and present at least one seminar per quarter. Oral presentation of research results is an important skill for a career in science. After advancement to candidacy, attendance is still required and students are encouraged to present seminars concerning their dissertation research.
- v) Complete three Special Topics course prior to being advanced to candidacy. Please check with the Graduate Student Affairs Officer about the availability of special topics courses being offered each quarter — courses are sometimes offered at the last minute!

4. Complete your teaching requirement.

One of the goals of this graduate program is to train research scientists who are qualified to teach in a field of medical science. You will be required to assist in the teaching of at least one quarter of course instruction on campus. You will receive course credit for serving as a Teaching Assistant by enrolling in BMSC 302 (Directed Teaching). Please contact the Graduate Program Student Affairs Officer to enroll for this course. Teaching may be done at any time, but we recommend that it be done in the third or fourth years. You will also be required to complete TA Training through the Teaching Assistant Development Program (TADP). Training consists of **Orientation** (offered at the beginning of fall quarter), **2 Prep Courses**, and **3 Workshops**. Please see the TADP website for more information

<http://www.tadp.ucr.edu>

5. Pass the Qualifying Examination.

You will be required to complete a **Qualifying Examination**, usually before beginning the third year. The five-member **Qualifying Exam Committee**, which may not include the Major Professor, will be nominated by the student in consultation with the Major Professor, officially approved by the Graduate Advisor, and appointed by the Graduate Dean. One member of the Oral Qualifying Exam Committee, not from the Biomedical Sciences program, will be designated as the **Outside Member**. This committee should be nominated *at least one month prior* to the Oral Qualifying Examination using a form that is available from Kathy Redd.

The goal of Qualifying Exam is for the student to apprise the Committee of the proposed research in a clear and comprehensive manner, so that the Committee members can evaluate it fairly and provide advice and direction to the student.

The Committee is concerned with several issues:

- a) The research program focuses on a significant problem;
- b) Methods are appropriate and rigorous;
- c) The research has been thoroughly and carefully designed;
- d) Pitfalls and alternatives have been considered;
- e) The program can be accomplished in a reasonable period of time.

Part I of the exam will consist of the preparation of a research proposal, to be written in the form of a grant proposal in NIH or NSF format, including literature review, description of methods and experimental plans for the dissertation. This proposal will outline the research progress of the student to date, as well as delineate the planned dissertation research aims and objectives. The proposal should be comprehensive yet succinctly written. Kathy Redd has some representative proposals available in her office to serve as models. The student must show the feasibility of the work proposed, and should provide the information needed to consider possible pitfalls. The demonstration of feasibility does NOT require that the research be near completion before the proposal is presented. The Major Professor indicates his or her approval by completing the Research Proposal for Oral Qualifying Examination form (located in this section of the handbook). After approval has been obtained, a hard copy of the form and proposal should be circulated to all members of the Qualifying Exam Committee **at least one week before the exam**. The Committee evaluates the research proposal and then conducts the oral component of the qualifying examination (Part II). Students are encouraged to speak with the Committee Chair and members for advice on preparing for the exam.

Part II of the qualifying examination will be the oral comprehensive examination administered by the Qualifying Exam Committee. International Students must pass the exam before the beginning of their 3rd year in order to have their Non-Resident Tuition covered fully. The exam is conducted by the Qualifying Exam Committee in

accordance with the regulations set forth in the UC Riverside Graduate Student Handbook: <http://www.graduate.ucr.edu/GSHndbk.pdf>.

The oral presentation at the exam should summarize the written proposal and may supplement the written information. During the oral exam the student should present the overall plan for the research, but should also focus on providing evidence of feasibility, and on the practicality and appropriateness of the methods.

Successful completion of the Qualifying Exam requires approval from all committee members by signing the “Report of the Qualifying Examination” form at the time of the exam (available from Kathy Redd).

If a student does not pass the oral qualifying exam, the Qualifying Exam Committee has the discretion to allow the student to retake the exam one additional time, usually no sooner than 1 quarter after the date of the 1st oral exam. A student who does not pass the oral qualifying exam may be dismissed from the program or may be allowed to complete an M.S. degree. The Graduate Advisors, in consultation with the Qualifying Exam Committee will determine if transfer to the M.S. program is recommended.

A doctoral candidate in good standing will be **advanced to candidacy** if the student has passed the qualifying examination, has completed all required coursework, and has filed the appropriate paperwork for formal advancement to candidacy.

6. Work on your Dissertation.

Once a student has advanced to candidacy (passed the oral qualifying examination), a Dissertation Committee of three faculty members will be nominated by the student in consultation with the Major Professor, officially approved by the Graduate Advisor, and appointed by the Graduate Dean. The Dissertation Committee is chaired by the student’s Major Professor. The Dissertation Committee often is the same as the Student Advisory Committee, although this does not need to be the case. The function of this committee is to serve as informed experts and advisors to the student on various aspects of the thesis research. It should be composed of faculty who can provide really valuable input to your project. To carry out this function, the committee members should be regularly apprised of research progress. The Dissertation Committee will meet with the student every spring quarter to evaluate the student’s progress. The Dissertation Committee has responsibility for the content of the dissertation. A dissertation of the research will be prepared and presented in the form prescribed by the Graduate Division. Workshops sponsored by the Graduate Division are held to instruct students in the preparation of their dissertation.

7. Defend your Dissertation.

Before the dissertation is given final approval by the **Dissertation Committee**, the student must present a public lecture on the dissertation research to faculty and students in the program.

Filing Fee Status

Students who have completed all degree requirements except for filing their dissertation or completing the final examination are eligible for Filing Fee status during the final quarter of residence. For students writing dissertations, the major professor must certify that the student's committee has read and approved a draft of the manuscript and that only minor revisions need to be made.

Students on filing fee status pay only one-half of the Registration Fee rather than register and pay full fees. Only one quarter of Filing Fee status is allowed. Students who fail to complete their degree programs must register and pay full fees for the following quarter.

Students on Filing Fee status are not eligible to receive Fellowship Funds and cannot be paid as a Graduate Student Researcher (GSR).

Leaves of Absence

A leave of absence is intended to allow the temporary interruption of the student's academic program. Leaves are granted for the following reasons: (1) serious illness or other temporary disability; (2) the need to concentrate on a job or occupation not directly related to the degree program; or (3) family responsibilities.

Frequently Asked Questions

What is enough research for a dissertation?

This is very difficult to answer because there are so many variables. A Ph.D. is not awarded just for years spent in the laboratory. It is awarded for an original, significant, and 'rounded' body of "new knowledge". A good guideline is that it is about equivalent to three papers in a high quality journal. How long it takes to produce this depends on luck, the good judgment/powers of prediction of your Dissertation Committee, and the hours, energy, and commitment that you put in. If at any time you feel uncomfortable about the progress of your dissertation research, you should discuss this with your committee members.

What is the role of the Graduate Advisor?

This, too, is a little difficult to define because the Graduate Advisor is the liaison between the department and Graduate Division, and serves the faculty in the Graduate Program as well as the students in the Program. The Graduate Advisor therefore has to "play the heavy" with regard to the administration of Graduate Division or Program regulations, but also serves as a student advocate. The Graduate Advisor is almost always available for consultation. All discussions will be held in confidence unless the student desires otherwise.

SATISFACTORY ACADEMIC PROGRESS

Normative time to the Ph.D. degree in Biomedical Sciences is fifteen quarters (five years). Normative time is defined as the period of full-time registration required to earn the degree, assuming that the student enters with a bachelor's degree and has no course deficiencies or need to take any remedial work. As stated above, the individual student's program of study is planned in consultation with his or her Guidance Committee, which supervises the student's progress prior to the appointment of the Dissertation Committee. After the student advances to candidacy, the Dissertation Committee oversees the student's progress in the final stages of his or her degree program. For all students, evaluations of progress are carried out each spring. Students meet with their Guidance or Dissertation Committee and the student's Major Professor submits the **Annual Progress Report** form to the Graduate Advisor summarizing the discussion of the Committee. The Graduate Advisor is then responsible for making specific recommendations to the Graduate Division concerning the student's progress. The Graduate Advisor may also approve exceptions to the normal time schedule occasioned by unusual circumstances. Students are provided with a copy of the annual evaluation, and copies are forwarded to the Graduate Division.

UNSATISFACTORY ACADEMIC PROGRESS

It is expected that students will make good progress in the Biomedical Science Graduate Program. The Graduate Division will block registration of students who fail to perform satisfactorily. In addition, unsatisfactory academic progress severely limits opportunities for receiving funding through the Program. Students are considered to be making unacceptable progress when:

- they fail to fulfill program requirements such as exams or research in a timely and satisfactory manner.
- the overall GPA drops below the minimum level of 3.50 for fellowship recipients, 3.25 for those holding TA appointments, or 3.00 for non-supported students;
- they have 12 or more units of "I" grades.
- the Major Professor feels that the student is not making normal progress in the laboratory.

TIME TABLE CHECKLIST FOR Ph.D. DEGREE

Name: _____ Quarter entered degree
 program: _____

Chair of Guidance Committee: _____

Members of Guidance Committee: _____

	<u>Target Date</u>	<u>Date Completed:</u>
Year 1		
Meet with the Director and Graduate Advisor And establish Guidance Committee	1st quarter	_____
Do Rotations	1st – 2nd qtr	_____
Select Major Professor	Before Summer	_____
Meet with Guidance Committee (annual review of progress)	3rd quarter	_____
Year 2		
Nominate Oral Qualifying Exam Committee	Fall or Winter Qtr.	_____
Research Proposal to Committee	Winter or Spring	_____
Take oral qualifying exam	Spring/Summer	_____
Meet with Guidance/Dissertation Committee (annual review of progress)	Spring Quarter	_____
Year 3		
Meet with Guidance/Dissertation Committee (annual review of progress)	Spring Quarter	_____
Year 4		
Meet with Guidance/Dissertation Committee (annual review of progress)	Spring Quarter	_____
Year 5		
Write Dissertation	All quarters	_____
Meet with Guidance/Dissertation Committee (annual review of progress)	Spring Quarter	_____
Publicly Defend Dissertation	Final Quarter	_____

PROPOSAL FOR ORAL QUALIFYING EXAMINATION

As Major Professor to _____, I have read and hereby grant the release of this research proposal to the members of the Oral Qualifying Examination Committee.

Signature & date

FINANCIAL SUPPORT

Students admitted to the Ph.D. program typically receive financial support for 5 years. During the first year, the main sources of graduate student support are Fellowships and Graduate Student Research Assistantships obtained through the Program. After the first year, the majority of a student's financial support comes from Graduate Student Research Assistantships obtained through research grants awarded to the Major Professor and Teaching Assistantships. Students who enter the Ph.D. program with strong undergraduate records are encouraged to apply for National Science Foundation, Howard Hughes Medical Institute, or other extramural fellowships. Students who have Advanced to Candidacy are also encouraged to pursue extramural fellowship funding. Other support is available through a variety of University, State, and Federal sources.

Important FAFSA Information: Fellowship/Grant awards are paid from a variety of funding sources, some of which require socioeconomic and parental educational history and financial data. Students who accept fellowship and/or grant awards are required to complete the *Free Application for Federal Student Aid (FAFSA)*. FAFSA electronic filing is available at: www.FAFSA.ed.gov If you expect to receive financial support from UCR, you must file FAFSA every year (after you've prepared your federal tax return). **Continuing International Students are also be required to complete FAFSA.**

Graduate Student Research Assistantships (GSRs): These positions are supported either with funds that come from the Program or from the Major Professor's grant. Students with GSRs receive a partial remission of fees and payment of the Graduate Student Health Insurance Program Fee.

Teaching Assistantships (TAs): The type of work involved in TAing varies according to the class assigned. When a student is appointed as a TA, they receive a detailed letter explaining the duties for the position. Students with Teaching Assistantships receive a partial remission of fees and payment of the Graduate Student Health Insurance Program Fee.

NOTE: TAs and GSRs must be making acceptable progress toward their degree objective, must be advanced to candidacy within 12 quarters after entry, and must have fewer than 8 units of Incomplete grades. In addition, TAs must maintain a 3.25 GPA; GSRs must maintain a 3.00 GPA.

Summer support: Students in the Program are normally supported by their Major Professor during the summer.

Dissertation Research Grants provide funds to doctoral candidates for research expenses associated with the dissertation. Applicants must be advanced to candidacy and plan to be registered during the period of the award. Proposals may

be funded up to a maximum of \$1,000. These funds may not be used for preparing the dissertation copy or as a stipend for personal support. You can download the application from the web at www.graddiv.ucr.edu/finsuptoc.html

Graduate Student Association (GSA) Minigrants help to pay the travel expenses of students who have been invited to present scholarly papers or posters at regional and national professional conferences. The program is administered by the Graduate Student Association and requires that Departments or Graduate Programs agree to provide matching funds. Contact the GSA, at x83740 or <http://www.gsa.ucr.edu/>, or the Graduate Student Affairs Officer for minigrant applications.

EXTRAMURAL SUPPORT

In addition to the fellowships, assistantships, grants, and loans administered by the University, graduate students may also be eligible for other types of support provided by federal agencies and private foundations. Organizations that have awarded fellowships and research support to UCR students include the National Science Foundation, National Institutes of Health, U.S. Public Health Service, U.S. Department of Education, Fulbright Program, Phi Beta Kappa Alumni Scholarships for International Scholars, and Sigma Xi. If students wish to explore these sources of support for study, they should consult the *Annual Register of Grant Support* and other similar directories either at the reference department of the library or through the Financial Support section in the Graduate Division. There are also many sites on the World Wide Web devoted to various sources of aid for graduate students.