

University of California, San Diego



Guidelines

**For Students and Faculty
2008-2009**

Website: <http://biomedsci.ucsd.edu>

UCSD Campus Mail Code 0685



Chair:

Jean Y. J. Wang, jywang@ucsd.edu
4328 MCC, Phone: (858) 822-2001

Vice-Chair:

Tracy Handel, thandel@ucsd.edu
PSB 3246, Phone: (858) 822-6656

Director of Program and Student Affairs:

Gina Butcher, gbutcher@ucsd.edu
5012 BSB, Phone: (858) 534-1823, Fax: (858) 534-0006

Student Affairs Coordinator:

Leanne Nordeman, lnordeman@ucsd.edu
5008 BSB, Phone: (858) 534-3982, Fax: (858) 534-0006

Program Affairs Coordinator:

Kathy Klingenberg, kklingenberg@ucsd.edu
4329 MCC, Phone: (858) 822-2001, Fax: (858) 534-2821

Table of Contents

ORGANIZATION OF THE BIOMEDICAL SCIENCES GRADUATE PROGRAM	3
ADVISORY SYSTEM	
FIRST YEAR ADVISORS	4
THESIS ADVISORS	5
COURSE SEQUENCE	6
REQUIRED COURSES	6
ELECTIVE COURSES	8
LABORATORY ROTATION PROGRAM	8
TEACHING REQUIREMENT	10
PROGRESS TOWARD THE DEGREE	11
TIME TO DEGREE AND LIMITATIONS	11
SELECTION OF THESIS LABORATORY	11
RESEARCH PROPOSITION EXAM	12
ADVANCEMENT TO CANDIDACY EXAM	15
PRESENTATION AND DEFENSE OF THE DISSERTATION	16
SUMMARY OF TIMELINES	18
REPORTS AND EVALUATIONS	19
ANNUAL COMMITTEE REVIEW OF FIRST YEAR PERFORMANCE	19
ANNUAL REVIEW OF PERFORMANCE BEYOND FIRST YEAR	19
SUMMARY OF ANNUAL REVIEW TIMELINE	20
STUDENT AWARDS	20
POLICIES ON STUDENT SUPPORT	21
TERMINAL MASTERS DEGREE	21
LEAVES OF ABSENCE	21
<u>GUIDELINES FOR M.D./Ph.D. CANDIDATES</u>	
ADMISSIONS, COURSE WORK, ROTATIONS, REGISTRATION	23
SCHEDULE FOR M.D./Ph.D. STUDENTS	24
<u>GUIDELINES FOR Pharm.D./Ph.D. CANDIDATES</u>	
ADMISSIONS, COURSE WORK, ROTATIONS, REGISTRATION	25
SCHEDULE FOR Pharm.D./Ph.D. STUDENTS	27
<i>Appendix - Outreach Activities</i>	28

I. ORGANIZATION OF THE BIOMEDICAL SCIENCES GRADUATE PROGRAM

The Biomedical Sciences (BMS) Ph.D. Program is sponsored by UCSD Health Sciences, including the School of Medicine (SOM) and the Skaggs School of Pharmacy and Pharmaceutical Sciences (SPPS). The program offers broad opportunities for advanced studies in medically-oriented disciplines of cell and molecular biology, pharmacology, physiology, genetics, immunology, microbiology, biochemistry, bioinformatics, cancer biology, endocrinology, neurobiology, stem cell biology, structural and chemical biology, among other areas. The program is designed to develop research scientists who will be well equipped with the knowledge and the skills to solve biomedical problems creatively and independently in the public and the private sectors. A particularly attractive feature of the program is its multidisciplinary character providing students with a broad choice of faculty and laboratories for research training.

The operation of the BMS Graduate Program is overseen by the Chair, Vice Chair, and a series of committees as outlined in the organizational chart.

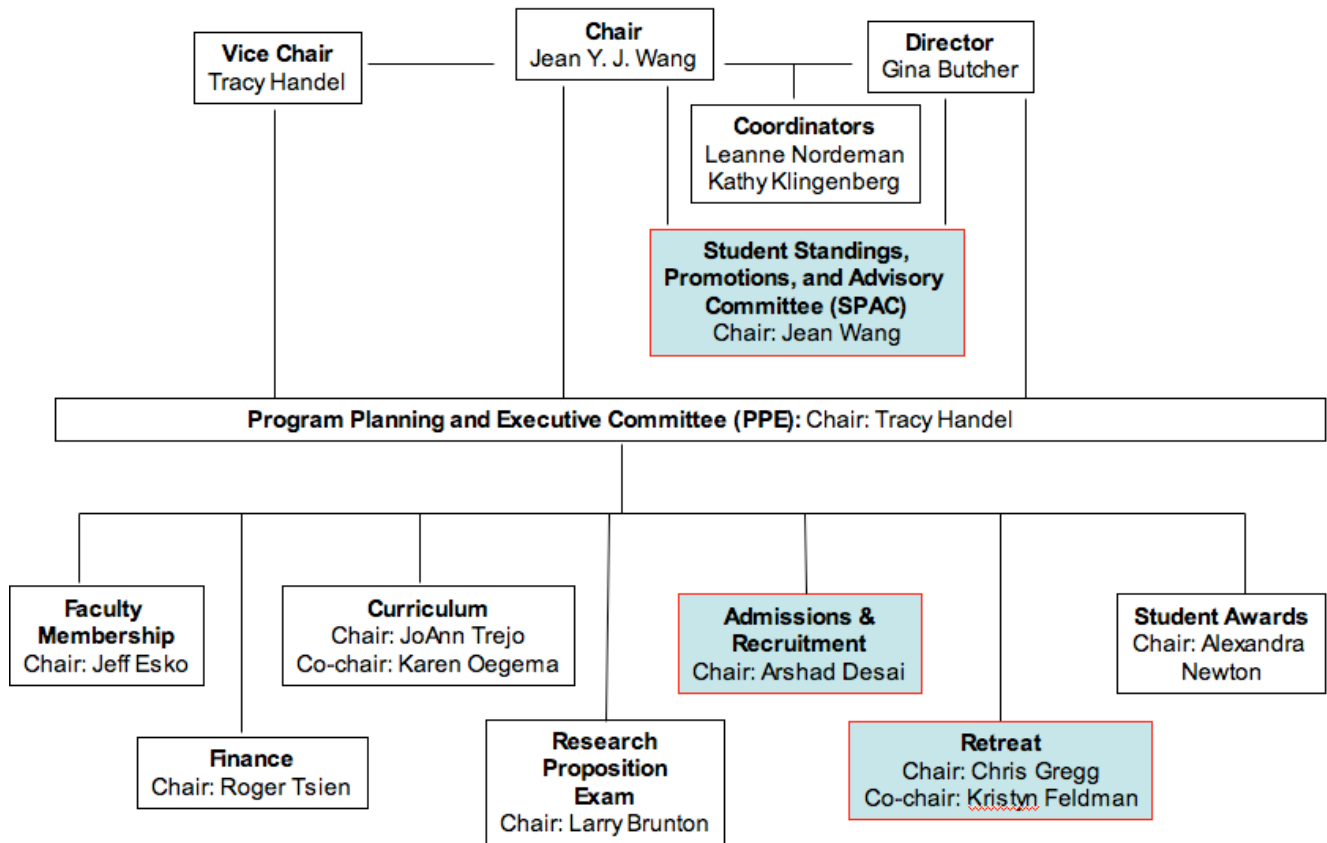
The Program Planning and Executive (PPE) Committee oversees programmatic and fiscal developments, and its members selectively participate in six major program committees: Admissions and Recruitment, Curriculum, Faculty Membership, Finance, Research Proposition, and Student Awards (see Org chart). The Graduate Student Admissions and Recruiting Committee oversees the admissions process in the winter and recruiting efforts throughout the year. The Curriculum Committee, consisting of the Track Leaders and the Course Directors, oversees the development, the implementation and the evaluation of courses in the BMS program. The Faculty Membership Committee evaluates the applications of new faculty members; it also reviews the existing program faculty members once every three years, and has the authority to terminate faculty membership in the BMS program. The Finance Committee advises the Chair on the development of funding mechanisms to support the first-year students, the program staff and program activities. The Research Proposition Committee administers the Research Proposition Qualifying Exam, it also mentors first-year students with their applications for pre-doctoral fellowships and awards. The Student Awards Committee oversees the selection of awardees and presents the awards at the BMS annual retreat. The BMS program values the input of students, who serve on the Admissions and Recruiting Committee, the Curriculum Committee and participate in the planning of the BMS annual retreat.

The Student Standing, Promotions and Advisory Committee (SPAC) provides an important advisory system for the students, particularly during their first year in the program. The SPAC committee assists the BMS Chair in resolving problems arising with the first-year students prior to the selection of Thesis advisors.

Currently, there are 213 graduate students and 159 faculty members from UCSD and the neighboring Burnham and Salk Institutes. The BMS faculty members are also affiliated with a number of research centers and institutes, including the Moores Cancer Center, the Ludwig Institute for Cancer Research, the Howard Hughes Medical Institute, the Glycobiology Research Training Center, the National Center for Microscopy & Imaging Research, the White Mountain Research Station, the La Jolla Institute for Allergy & Immunology, the Center for Research in Biological Structure, UCSD Stem Cell Institute, and the Scripps Research Institute. The list of BMS faculty members and their web pages are found at the BMS website: <http://biomedsci.ucsd.edu>.

BMS Organization Chart

BMS organization



II. ADVISORY SYSTEM

A. OVERVIEW

During the first year of study and prior to the selection of their Thesis advisors, BMS students are guided by their assigned advisors who are members of the SPAC committee. Student advising will be transferred to the Thesis advisors after the students enter the Thesis research laboratories. Student advising will be expanded to include faculty members of the student Thesis committee following the Advancement to PhD Candidacy. Students are free to contact the Chair and Vice-Chair of the BMS program for advice on concerns that cannot be resolved by their SPAC or Thesis advisors.

B. FIRST YEAR ADVISORS

Students enter the BMS program without having to commit to any particular laboratory or discipline. Prior to the selection of their Thesis advisors, each entering student is assigned an advisor from the Student Standing, Promotions and Advisory Committee (SPAC). The SPAC advisors provide counsel on course work and laboratory rotations, evaluate the student progress in the curriculum, and advise the students in the selection of their Thesis research advisors. SPAC Advisors and students should keep in touch at least twice per quarter until a student enters the lab of his/her Thesis advisor. The SPAC advisors should also check periodically on their advisees until the Advancement to PhD Candidacy is completed.

The responsibilities of SPAC advisors include the following:

- A. In consultation with the student, develop a laboratory rotation program during the Fall, Winter and Spring quarters to provide the student with an optimal exposure to the research disciplines that match the student's research interests.
- B. Guidance of the student in the selection of a Thesis advisor.
- C. Determination that the student is making satisfactory progress in meeting the program requirements, including completion of the Core courses, and the Research Proposition Exam.

C. THESIS ADVISORS

The primary advisors of the BMS students are their Thesis Advisors. Students are expected to enter the laboratories of their Thesis Advisors no later than June 30th of the 08/09 academic year.

The responsibilities of the Thesis advisors are:

- A. Obligation to provide for the financial support of the student. BMS program support of the first-year students will terminate as of June 30th of the 08/09 academic year.
- B. Guidance of the student in development of a research project that is original and feasible, such that the completion of which will lead to a Ph.D. Thesis and peer-reviewed publication(s).
- C. Determination that the student is making progress in meeting the PhD requirements, including (a) the timely completion of the Research Proposition Qualifying examination by Thanksgiving day of the student's second year in the program, (b) the timely completion of the Advancement to Candidacy examination by the Fall quarter of the student's third year in the program and (c) the timely submission of a formal annual evaluation of the student's research progress in consultation with the student's Thesis committee by the end of each Spring quarter beginning in the student's second year in the program.
- D. In consultation with the student, develop a series of elective classes to expand the student's knowledge in the areas that are relevant and/or complementary to the student's Thesis research project.
- E. Guidance of the student in developing skills to communicate scientific ideas in writing and in person, through participation in journal clubs, research meetings, seminars, symposia and the preparation of fellowship applications and manuscripts.

III. COURSE SEQUENCE

A. OVERVIEW

The BMS students are expected to complete a series of *required core courses* during the first year. In the Fall quarter, Ph.D. students in the BMS program will take the core courses BIOM 200A and B, "Molecules to Organisms: Concepts" and "Molecules to Organisms: Approaches". In addition,

all BMS students, including the Ph.D, MSTP, and SPPS students are required to take a seminar course BIOM 201 “Seminars in Biomedical Research”. In the Winter and Spring quarters, students are **required to take 3 or 4 elective courses** offered by the various Training Tracks, as well as additional seminar courses. Two short courses in Statistics/Computer analysis and Scientific Ethics are also required for all students and they are offered in the Spring quarter.

Consideration for exemption from the required courses is given to students who have previously completed courses that cover the core material. Students petitioning for exemptions are asked to provide appropriate details of courses (syllabi) taken at other institutions to the Course Directors, who in consultation with the Chair of the Curriculum Committee and the Chair of BMS will determine the validity of the petitions.

A minimum of 12 units per quarter is required, which includes laboratory rotations and Thesis research. According to policies set by the UCSD Graduate Council and executed by the Office of Graduate Studies (ogs.ucsd.edu), graduate students must maintain a 3.0 GPA and cannot have more than 8 units of F or U grades.

B. THE SEQUENCE OF CORE COURSES FOR THE FIRST TWO YEARS:

REQUIRED COURSES

YEAR I			
<i>Course No.</i>	<i>Title</i>	<i>Units</i>	<i>Evaluation</i>
FALL QUARTER			
BIOM 200A	Molecules to Organisms: Concepts	6	Letter grade
BIOM 200B	Molecules to Organisms: Approaches	2	Letter grade
BIOM 201	Seminars in Biomedical Research	4	Letter grade
BIOM 298	Laboratory Rotation (<i>one 12-week or two 6-week</i>)	4	S/U
WINTER QUARTER			
BIOM 298	Laboratory Rotation (<i>one 12-week or two 6-week</i>)	4	S/U
Choose 2 Track courses			
BIOM 252	Genetics and Genomics	3	Letter grade
BIOM 253	Pathogens & Host Defense 1*	3	Letter grade
BIOM 254	Molecular and Cell Biology 1*	3	Letter grade
BIOM 255	Drugs and Disease 1*	3	Letter grade
PATH 221	Molecular Pathology of Cancer	3	Letter grade
Choose 1 Seminar course:			
BIOM 275	Seminars in Pharmacology	2	Letter grade
PATH 225	Seminars in Molecular Pathology	2	Letter grade
SPRING QUARTER			
BIOM 298	Laboratory Rotation (<i>one 12-week or two 6-week</i>)	4	S/U
BIOM 219	Ethics in Scientific Research	1	S/U
BIOM 285	Statistical Inference	2	Letter grade
Choose 1 (or 2) Track course:			
BIOM 226	Hormone Action	3	Letter grade
BIOM 252	Genetics and Genomics	3	Letter grade
BIOM 253	Pathogens and Host Defense 2*	3	Letter grade
BIOM 254	Molecular and Cell Biology 2*	3	Letter grade

BIOM 255	Drugs and Disease 2*	3	Letter grade
PATH 221	Molecular Pathology of Cancer	3	Letter grade
Choose 1 Seminar course:			
BIOM 272 & 274	Seminars in Genetics & MCB	2	Letter grade
BIOM 276	Seminars in Physiology	2	Letter grade
SUMMER QUARTER			
Choose lab by June 30th and devote full time to thesis work			

*1 and 2 are independent courses

BMS students are expected to devote full-time effort to laboratory research each summer.

YEAR II			
<i>Course No.</i>	<i>Title</i>	<i>Units</i>	<i>Evaluation</i>
FALL QUARTER			
BIOM 298	Thesis Research	12	Letter grade
BIOM 296	Research Proposition	4	S/U
WINTER QUARTER			
BIOM 298	Thesis Research	12	Letter grade
☛ BGGN 500	Apprentice Teaching or Outreach Activities	4	S/U
SPRING QUARTER			
BIOM 298	Thesis Research	12	Letter grade
☛ BGGN 500	Apprentice Teaching or Outreach Activities	4	S/U
<i>Appointment of Official Thesis Committee</i>			
<i>Advancement to Candidacy</i>			

☛ *Apprentice Teaching requirement: One quarter to be fulfilled in Winter or Spring Quarter*

C. ELECTIVE COURSES

Students are required to take 15 graduate units as electives; of these at least 8 units must be taken for a letter grade (A-F). Note that the Teaching Requirement constitutes a recognized educational experience and counts as 4 units toward the S/U elective requirement. The elective courses are chosen by each student in consultation and with the approval of the Thesis advisor and, for students following a particular Track, by recommendation of that particular Track Leader. Note that students are not required to affiliate with a Track and are free to choose the courses that best fulfill their training needs. Some appropriate elective courses that are currently offered are listed below. Elective courses in BMS are being developed continuously, driven the scientific developments in biomedical research. Elective courses developed by the BMS faculty members are posted at the BMS website. Students should also survey the graduate level course listings offered at UCSD through TritonLink for options and availability provided by other graduate programs at the University. Students are encouraged to take elective courses throughout the period of their doctoral training. Students can take any course offered on the general campus or in the School of Medicine, as well as applying for UCSD Extension courses through OGS.

Examples of BMS-Sponsored Elective Courses

FALL 2008

BIOM 242 SEMINAR IN GENETICS
MED 246 CURRENT LITERATURE IN GLYCOBIOLOGY
MED 275 SCIENCE MEETS THE MEDICAL PATIENT
NEU 268 MOLECULAR AND CELLULAR NEUROBIOLOGY
PHAR 201 BIOINFORMATICS I – BIOLOGICAL DATA REPRESENTATION AND ANALYSIS
PHAR 230/ BIOM 230 STRUCTURAL AND QUANTITATIVE PHARMACOLOGY
SOM 204 GLYCOBIOLOGY AND MEDICINE Reading Group Workshop
SPPS 215 HUMAN DISEASE

WINTER 2009

CMM 250 STEM CELL BIOLOGY
PHAR 235/ BIOM 231/ CONTEMPORARY TOPICS IN THE PHARMACOLOGICAL SCIENCES
PHAR 240/ SOM 240/ SPPS 260 PHARMACOLOGIC ANALYSIS OF PHYSIOLOGIC
SPPS 240 HISTOLOGY

SPRING 2009

BE 276 TRANSPORT AND MOLECULAR MECHANISMS IN THE MICROCIRCULATION
CHEM 266/166 ENVIRONMENTAL AND MOLECULAR TOXICOLOGY
CMM 264/ SPPS 268 PROTEOMICS FOR BIOLOGISTS
MED 225/ BIOM 222/CHEM 237/BIO 236 ESSENTIALS OF GLYCOBIOLOGY
MED 238/BE 238 MOLECULAR BIOLOGY OF THE CARDIOVASCULAR SYSTEM
MED 252/ BIOM 250 MOLECULAR AND MODERN METHODOLOGIES IN PHYSIOLOGICAL SCIENCES
MED 264/ BIOM 224 MOLECULAR AND CELLULAR BASIS OF DISEASE
MED 271 GENE THERAPY AND MOLECULAR MEDICINE COURSE
PATH 223 MOUSE MODELS FOR HUMAN DISEASE
PATH 228/ PHAR 228/ BIOM 228 MODERN DRUG DISCOVERY TECHNOLOGIES
PHAR 208B/ BIOM 208B HUMAN DISEASE, MEDICAL THERAPEUTICS
PHAR 228 MODERN DRUG DISCOVERY TECHNOLOGIES
PHAR 234/ BIOM 234 CAREERS IN BIOMEDICAL SCIENCES
PHAR 276/ BE 276/ CHEM 276/ MATH 276/ NUMERICAL ANALYSIS IN MULTI-SCALE BIOLOGY

IV. LABORATORY ROTATION PROGRAM

A. OVERVIEW

The laboratory rotation program is offered to Ph.D. students during their first year of study. MSTP and SPPS students are expected to have completed laboratory rotation before entering the BMS program.

Laboratory rotation is designed to introduce students to new techniques and concepts. It should also expose students to the creative aspects of experimental design. Furthermore, the rotations provide

the student with the opportunity to explore potential Thesis research projects and to work with potential Thesis advisors and their research groups.

The specific guidelines for the research rotation program are:

1. Students can choose to conduct rotations of *either* 12-week or 6-week in length in each of the three academic quarters during their first year.
2. Students must devote full time to the rotation program. Students cannot take breaks (particularly not 6-week breaks) from the rotation program. Students can be excused from participation in the rotation program only under extraordinary circumstances, and after approval by the SPAC advisor and the chair of the BMS program.
3. The duration of each rotation will be determined by agreement between the student and the rotation advisor *prior to the onset* of the rotation. The duration of each rotation *should not be altered* after the student joins the rotation lab.
4. The rotations during the Fall quarter *must be* conducted in the labs of BMS faculty members. Thereafter, BMS students can choose to conduct *one and only one* laboratory rotation, either for 12 or 6 weeks, in a non-BMS faculty lab, contingent upon approval by the student's SPAC advisor.
5. It is possible for a student to enter the laboratory of his or her Thesis advisor as early as the first Winter quarter, for example, after the student completes three 6-week rotations.
6. Students must enter laboratories of their Thesis advisors by the end of Spring quarter. The BMS program will not provide student support beyond the first Spring quarter.

B. DEVELOPMENT OF A ROTATION PLAN

Students are advised to discuss their plans for rotations with their SPAC advisors and/or the leaders of the Research Tracks. The BMS website posts rotation projects submitted by faculty members. *Access to these project descriptions will be password-protected and only available to BMS students who are actively participating in the Research Rotation Program.* It is the student's responsibility to approach the faculty of choice and to make the appropriate arrangements for each rotation, e.g., beginning date, duration, project, readings and laboratory orientation. Once finalized, the rotation plan must be approved by the student's SPAC advisor.

C. RESPONSIBILITY OF ROTATION RESEARCH ADVISOR

The success of the rotation program depends on thoughtful and conscientious participation by both students and faculty. BMS faculty are encouraged to post rotation project descriptions on the BSM website. Access to these project descriptions will be password-protected and only available to first-year students who are actively participating in the Research Rotation program. Rotation projects should be constructed to introduce students to new concepts and techniques, allowing students to design and conduct experiments. Rotations should not be designed simply "to get more results" for the labs, although carefully constructed rotation projects will inevitably lead to interesting results. Bench and desk space, reagents, and other necessary materials as well as access to the laboratory personnel should be provided for each rotation student to allow integration of the rotation student into the research laboratory of the faculty.

D. REQUIRED NUMBERS OF ROTATIONS/PETITIONS FOR ADDITIONAL ROTATIONS

Each student must complete a minimum of **three rotations in three different BMS laboratories** before joining a thesis lab. **The rotations in the Fall quarter must be in laboratories of BMS faculty members.** Thereafter, students can choose to rotate through **one and only one** non-BMS labs contingent upon the approval of their SPAC advisors. It is possible for a student to enter a Thesis lab as early as the first Winter quarter after completing three rotations in three different BMS labs. BMS students must complete the rotation program by the end of their first Spring quarter and no later than **June 30th of the 08/09** academic year.

Students unable to enter a Thesis laboratory by June 30th will have to file a petition for additional rotations through their SPAC advisors. The student's SPAC advisor and the BMS chair will review the petition for additional summer rotations. If the petition is approved, a student can conduct **two and only two** rotations in the summer months. Failure to enter a Thesis laboratory by **August 31 of the 08/09** academic year will result in **termination** of the student's study in the BMS program.

The recommended number of units for rotations can vary from 4-12, and students should enroll for the S/U (Satisfactory/Unsatisfactory) grading option. For enrollment purposes, the Section I.D. for laboratory rotations (BIOM 298, Directed Study, 1-12 units) is listed in the "Schedule of Classes" under Biomedical Sciences and under each instructor's name. It is important to note that each individual BMS faculty member has her/his own section number. Do also note that the course number changes to BIOM 299 (Independent Study, 1-12 units) following the Advancement to Candidacy.

V. TEACHING REQUIREMENT

Ph.D. students in the BMS program are required to devote a proportion of one quarter during their second (or third) year of study to a teaching experience as a Teaching Assistant in courses administered by the Division of Biological Sciences, by the School of Pharmacy (SPPS), or by the BioBridge Program. BMS students are also encouraged to participate in one of the approved outreach programs. The Teaching Requirement constitutes a recognized educational experience and counts as 4 units toward the S/U elective requirement. Participation in an approved Outreach program counts as 4 units towards the S/U elective requirement.

Teaching Assistantships typically last for one quarter (~10 weeks). In addition to attending the course lectures, the assistantships include leading discussion sections, workshops or laboratories, and the grading of exams. Students are trained in teaching techniques through the Center for Teaching Development (www-ctd.ucsd.edu) and receive evaluations on their performance. Students should contact the BMS director, Gina Butcher, for the currently approved University courses that satisfy the BMS teaching requirement.

In addition to didactic classroom teachings, the student may gain additional experiences by participation in approved outreach programs (*See Appendix*). The BMS approved outreach programs are directed at (a) educating the public in biology and biomedical sciences and their potential for society or (b) providing public education on the importance of science to guide policy decisions on medical or environmental health issues.

VI. PROGRESS TOWARD THE DEGREE

A. TIME TO DEGREE AND LIMITATIONS

The Office of Graduate Studies (OGS) at UCSD has established a general "Policy on Time Limits to the Ph.D." These strictly enforced University-wide time limits are:

Advancement to candidacy:	4 years (end of Summer Quarter)
Financial support:	7 years (end of Spring Quarter)
Total registered time:	8 years (end of Spring Quarter)

The BMS program graduate students are expected to progress in their study with an accelerated time line as follows:

Advancement to candidacy:	2 years (end of Summer Quarter)
Ph.D. thesis defense:	5 years (end of Summer Quarter)

BMS students who live in campus student housing can stay there up to seven years. Students should consult early with their Thesis advisor and the Chair of the Program if unforeseen problems (e.g., illness, family issues) will impact on meeting any of these time limits.

B. SELECTION OF THESIS LABORATORY

Each student selects the laboratory in which she/he will conduct thesis research after completion of the required rotations no later than June 30th of the 08/09 academic year. For enrollment purposes, the grading option for BIOM 298 changes from S/U to a letter grade (A-F) in the quarter in which the student enters the thesis laboratory.

The Thesis advisor selection must be approved by the SPAC Advisor and BMS Chair. Only full members of the BMS program can serve as Thesis advisors. However, if after completing the requirement for three rotations in laboratories of BMS members, a student wishes to work with a faculty member who is not affiliated with the BMS Program, the student must consult with their SPAC advisor on an appropriate course of action. The choice of a Thesis advisor who is not affiliated with the BMS Program will ultimately require approval of the BMS Chair. Under suitable circumstances, such arrangements can be approved with the appointment of a Thesis Committee Co-Chair who is a full BMS Program Member.

Following selection of a thesis laboratory, the responsibility for the student's progress in the program changes from the SPAC advisor to the thesis advisor. However, students should feel free to contact their SPAC advisors at any time for additional information and input, and the SPAC advisor should maintain contact with their advisees until they advance to candidacy.

Being in a non-BMS laboratory places additional risks on students, as experience has shown that mentors chosen outside BMS faculty leave the San Diego community at a higher rate than Program members. Students who do choose non-BMS mentors should:

- Maintain regular contact with the Co-Chair of his/her thesis committee. The student should talk to the Co-Chair at least twice per year for guidance in the program and, in addition, is encouraged to communicate with the SPAC advisor for additional information.
- Stay involved with the BMS Program (e.g., retreat, recruiting events, seminars, journal clubs, Wednesday lunch talks).
- Maintain regular access to seminars and journal clubs to round out training experience.

C. QUALIFYING EXAMINATIONS

The qualifying examination consists of two parts, the Research Proposition Exam and the Advancement to Candidacy Exam. Both are focused on the actual work that will comprise the original research whose completion will lead to a PhD degree. The examination system is designed to ensure that each student will develop a reasonably broad knowledge in multiple areas (as reflected in the Research Tracks and Focus Areas). The goal of these qualifying examinations is to ensure attainment of skills needed to identify significant research problems, collect and integrate diverse scientific information, and to develop sound and creative experimental designs to test a scientific hypothesis.

1. **Research Proposition Exam**

Overview

The Research Proposition includes two parts: a written research proposal that is *directly relevant to the student's Thesis project* and an oral examination during which the student will present and defend the proposed research. The written proposal and the oral examination should encompass any and all areas of the first year curriculum deemed relevant to the proposal as well as specialized knowledge required by the proposed research.

This BMS requirement will be known as the Research Proposition Qualifying Exam (BIOM 296, 4 credits). It will be administered by the Research Proposition Committee. The exam committee convened for each student will be called the Qualifying Exam Committee, which will be a precursor to the student's Thesis Committee. At the end of the Spring quarter, first year BMS students will be instructed in the following guidelines by the Chair of the Research Proposition Committee. Thesis advisers chosen by the students will be reminded of these program requirements.

Purpose

The Research Proposition is a grant-writing exercise that takes place during the Summer of the first year and the Fall of the 2nd year. The purposes of the Research Proposition are:

1. to get the student and Thesis advisor to work together at an early stage to develop the student's Thesis research project
2. to have each student choose a Thesis Committee early in the graduate career
3. to teach the student grant writing skills and oral presentation skills
4. to test the student's grasp of core material relating to the student's research project
5. to provide the basis for a fellowship application

The Written Proposal

The Thesis advisor should direct the student to the description of the sections of an NIH RO1 submission and mentor the student in grant writing. The written proposal will take the format of a shorter NIH grant, as follows (all lengths refer to single-spaced typing, 0.5" all around margins, 12 point, Arial type):

Title – No more than 60 characters, space included

Abstract – Half a page

Specific Aims – 1 page, with clear statement of rationale and hypothesis and no more than three specific aims

Background and Significance – 2 to 3 pages

Preliminary Studies – 2 to 3 pages; student may include his/her own results, the lab's prior studies, and other published results, if relevant.

Research Design and Methods – 5 to 7 pages, including discussions of anticipated outcomes and alternatives.

Literature Cited – Between 30-60 citations that support the rationale and the feasibility of the proposed research.

Graphics – Use Figures throughout the proposal to summarize the current knowledge, the research ideas, to show data and to depict experimental strategies.

The entire document must be NO MORE than 15 pages.

Timeline

At the end of the first Spring quarter, a representative of the Research Proposition Committee will meet with the students to go over the process. Exemplary written proposals from the past will be distributed if available.

During the Summer, the student and the advisor will work together to select an area for the student's Thesis work, and, under the direction of the advisor, the student will begin to read relevant papers and to develop familiarity with relevant experimental systems and procedures at the bench. The advisor should make the scientific portions of successfully funded grants available to the student, and encourage independent development of some of the themes in those grants. With the advisor, each student will begin to create an abstract of the proposed research project, centered on a testable hypothesis and a feasible number of specific aims (no more than **three** in total). The advisor and the student must also discuss possible membership of the student's Qualifying Exam Committee: consisting of the Thesis advisor plus 2 other BMS faculty members with expertise in the specific areas of the proposed research. Furthermore, the Research Proposition Committee will assign an additional faculty member to serve on the Qualifying Exam Committee. This committee should be viewed as part of the student's Thesis Committee (although membership can be changed subsequently).

In mid-late Summer, students and Chair of the Research Proposition Committee will meet to review student progress and the timeline to completion of this Qualifying examination. It is possible that some students will have written the *Title*, *Abstract* and *Specific Aims* sections of the proposal, and the group may choose to go over these together.

On the Tuesday following the Labor Day holiday, the *Title*, *Abstract* and *Specific Aims* will be due, electronically, in the program office (submission should be in the form of a *pdf* file, sent to lnordeman@ucsd.edu). The *pdf* file must include a *cover page* with a membership list of the student's Qualifying Exam Committee, and a signature of the student's Thesis advisor to signify approval of the submitted *Title*, *Abstract*, and *Specific Aims*. This group should be viewed as the likely Thesis Committee (although membership can be changed subsequently).

By September 15, the Research Proposition Committee must assign one of its members to each student's Qualifying Exam committee. The Research Prop member provides assurance of uniform standards in the proceedings and will generally be assigned on the basis of familiarity with the scientific proposal. It is important that the Research Proposition Committee representative on each student's Qualifying Exam Committee approves the general format and scope of the proposal, and/or discuss any problems and solutions with student and Thesis advisor before the end of September.

During the balance of September and October, the student will work with his/her advisor to complete writing the proposal to the satisfaction of all members. This is to be a learning experience, with ample give and take and with consultation by the student of all members of the Qualifying Exam Committee. The written proposal must be finalized by the end of October.

The Oral Presentation and Exam

In November, and not later than the Wednesday before Thanksgiving, each student will present and defend the proposal orally before the committee. The examination of the student will be centered on the scientific proposal but may take on the character of a General or Qualifying Exam, covering relevant materials from first year courses and additional materials judged to be essential to the proposal. The student is responsible for arranging a place and time suitable to all Committee members to conduct the oral exam.

The exam, about 90 minutes in length, longer if necessary, will begin with an oral presentation of the proposed research by the student. This presentation may incorporate exhibits and should not exceed 40 minutes in length, so that ample time remains for questioning. Questions posed by the Committee will cover the area of the student's presentation as well as fundamental principles of any and all disciplines of biomedical sciences, especially as they relate to the proposition.

At the end of the oral presentation and examination, the committee will deliberate under direction of the representative of the Research Proposition Committee and deliver critiques of both the written proposal and oral presentation and defense. The results (except those marked "confidential") shall be conveyed to the student immediately and to the Program office in writing. Satisfactory performance will permit the student to proceed with full time research. Unsatisfactory performance may necessitate re-writing or re-presenting the oral defense, or result in a recommendation that the student receive a terminal master's degree. The Program Chair shall be notified of failures or any problems that are noted by the student's Qualifying Exam Committee and the Research Proposition Committee.

Documents/information to be submitted to Program Office electronically (to lnordeman@ucsd.edu):

By student:

On or before Tuesday after the Labor Day holiday –

Title/Abstract/Specific Aims, with a list of members on the Qualifying Exam Committee, and a signature of the Thesis advisor signifying approval of the submitted document in one pdf file.

By Research Proposition Committee Chair/Co-Chairs:

By Sept 15 – Assignment of Research Prop Comm. representative for each student

By end of Fall quarter – grade sheet for BIOM 296

By Research Proposition representative on each student's Qualifying Exam Committee:

By Sept 30- Approval of the scope of the research and the Committee Membership.

By Qualifying Exam Committee for each student:

By October 31 - approval of the written proposal

By Wednesday before Thanksgiving – report and recommended grade in BIOM 296 for each student

Administration

Enforcement; Exceptions – BMS students are expected to complete the entire Research Proposition Exam process by Thanksgiving of the second academic year. There may be circumstances requiring

exceptions: e.g., illness, or academic difficulties in other areas. Exceptions will be considered on a case-by-case basis by the relevant program officers including the BMS Chair, and the Research Proposition Committee. In no case will the extension be granted beyond the second Winter quarter. ***Students will be denied further registration in the Program if the Research Proposition process is not successfully completed before the end of Winter Quarter of their second year.***

Grade and Credit - After the oral examination, an S/U grade recommendation will be made by the Qualifying Exam Committee and forwarded to the Program Office, to the attention of the Chair/Co-Chairs of the Research Proposition Committee, who will assign the final grades and sign the official grade sheets. An S will earn students 4 units of credit in the quarter in which the Research Proposition Qualifying Exam (BIOM 296) is completed. A student who fails to satisfactorily complete all elements of the Research Proposition within the prescribed time will earn a U grade and will be referred to the Student Standing, Promotions and Advisory Committee of the Biomedical Sciences Graduate Program for appropriate action. Satisfactory completion of the Research Proposition is a prerequisite to beginning the Thesis project.

2. Advancement to Candidacy Exam

Selection of a Thesis Committee

The Office of Graduate Studies (OGS) has specific and strict guidelines on the composition of a Thesis Committee. The Thesis Committee is chosen by the Thesis advisor and the student, with the consent of the Program Chair and the Dean of Graduate Studies and is appointed by the Office of Graduate Studies.

The Thesis Committee must have a minimum of 5 members and at least three must be BMS faculty. If all members are from BMS, then two must have a primary appointment in a department in which the Committee Chair has no affiliation, and one of these two must be a tenured UCSD faculty member (i.e., a Full Professor or Associate Professor). The Chair of the committee must be a member of the BMS program and will typically be the thesis advisor. A committee chair from outside BMS may not serve as the tenured, outside member. (The rules are complex and may seem to defy logic – please be sure to consult with the BMS Director and Coordinator of Student Affairs regarding the composition of thesis committees.)

The Thesis Committee has three functions: 1) it serves an advisory role in the conduct of the thesis research, 2) the first three members of the committee serve on the student's Qualifying Exam committee, and 3) the full committee, assembled according to the OGS rules, serves as the student's Advancement to Candidacy Examination Committee.

The intent of establishing a three-member committee early in the student's program and **well before** the Advancement to Candidacy is that its members may serve as informed experts and advisors to the student on various aspects of the thesis research. These committees are always to a student's advantage – so delay in assembling a committee is strongly discouraged as this delay almost invariably lengthens the time required to complete the PhD.

Following the successful completion of the Advancement to Candidacy examination, the thesis committee should meet ***at least annually*** to evaluate the student's research progress. Students should prepare and circulate to committee members a progress report in advance of each committee meeting.

Advancement to Candidacy Exam

The goal of this exam is for the student to apprise the Committee in a clear and comprehensive manner of the thesis research, 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 project can be accomplished in a reasonable period of time.

For the Committee to carry out its function and to conduct the Advancement to Candidacy examination optimally, the student prepares and submits to the committee a written description of proposed thesis investigation. ***This written document may represent an updated version of the Research Proposition or a new proposal in the format of the Research Proposition (see above).*** The written document should be circulated to the committee at least one week before the oral examination.

The oral presentation at the exam should summarize the written proposal and may supplement the written information. During the oral examination 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 Advancement to Candidacy requires approval from all committee members by signing the “Report of the Qualifying Examination” form at the time of the exam (available from the BMS office). Advancement to candidacy requires the student to pay a candidacy fee to the cashier prior to submitting the form to the Dean of Graduate Studies for final approval.

To reiterate the program policy, students must have an annual meeting with their thesis committee after the Advancement to Candidacy. The program takes these annual committee meetings very seriously. They are in the students’ interests – always. Students who do NOT have an annual Committee meeting in the prior academic year **will not be permitted to register** in the following fall quarter.

D. PRESENTATION AND DEFENSE OF THE DISSERTATION

The presentation and defense of the dissertation is divided into several steps:

1. When the student and advisor agree that the student’s research has reached a satisfactory endpoint (***normally during the student’s fifth year in the program***), the student convenes his or her Committee for a pre-defense meeting. At this meeting, the student provides the committee an overview of his or her work and an outline of the thesis. All committee members must approve that the body of work accomplished is sufficient for a thesis and that the student can proceed to writing his or her dissertation.

2. Once having obtained the approval to proceed, the student prepares the written dissertation. This document should present the individual student’s research and should be organized into a series of chapters including:

- Introduction (background and a clear statement of the problem being investigated or hypotheses being tested). This should be a stand-alone chapter that serves as a review of the

field, puts the research problem in the context of the field, and clearly summarizes the hypotheses being tested.

- Chapters describing published work (presentation as preprints is acceptable) and unpublished information (organized by Methods, Results, Discussion and Analysis in light of the problem or hypotheses stated in Chapter 1). The contribution of the student in multi-author papers must be clearly stated. If a figure is included that presents an experiment in which someone else helped or performed the experiment, this must be explicitly stated.
- Conclusions (discussion of the findings, larger implications of the work, and suggestions for future experiments). This should also be a stand-alone chapter that puts the findings of the research accomplished in the context of the field and describes how the field has been advanced.
- References

While there are no strict guidelines, a typical thesis is 100 – 200 pages. The BMS office has some recent dissertations for examples. The Thesis advisors should provide more examples. Students should also consult their Thesis Committee members for input. Typically, preparation of the written thesis requires 2-3 months, depending on whether parts of the thesis have already been published. To save time, students should check with OGS (534-3555) for the University guidelines (which are strict) on the format of the written thesis. The final version must conform to procedures outlined in the University publication- Instructions for the Preparation and Submission of Doctoral and Masters' Theses (available on the OGS website: <http://ogs.ucsd.edu/studentpublications/bluebook/>). OGS has very specific requirements that defy logic. Check the rules carefully and do so in advance of writing.

3. When the student and the advisor agree that the written dissertation is nearing final form, and upon approval of all members of the thesis committee, the student schedules a public research seminar immediately followed by a closed thesis defense. The Academic Senate requires that the student must submit a draft of the written dissertation to each member of the doctoral committee at least four weeks before the final examination. If recommended by the thesis committee, the closed defense may be held prior to the public presentation. Several months notice may be needed to find a date compatible with all members of the committee. Note that the public defense must be advertised to the university community in advance of the meeting. Following a successful examination and approval of the thesis, the committee signs the thesis and the Final Report form.

4. A final exit meeting with OGS is required for the degree. The student submits the approved thesis with the Final Report, and Degree and Diploma application to OGS. Upon approval by the Dean of Graduate Studies, the student files the dissertation with the University Archivist in the Mandeville Special Collections Library of Geisel Library, who accepts it on behalf of the Graduate Council, a subcommittee of the Academic Senate. Acceptance of the dissertation by the University Archivist and filing the Final Report with OGS represent the final steps in the completion of all requirements for the Ph.D. in Biomedical Sciences.

E. SUMMARY OF TIMELINES

Research Proposition Exam (BIOM296):		
<i>Task</i>	<i>Time</i>	<i>Responsible parties</i>
Res. Prop. Comm. meeting with the students.	End of Spring and mid-Summer	Students and Res. Prop. Comm.
Electronic submission to the BMS office of proposal Title, Abstract, Specific Aims; Qualifying Exam Comm. roster; approval signature of Thesis advisor.	On or before Tuesday after the Labor day holiday	Student and Thesis Advisor
Assignment of Res. Prop. Comm. Representative to each student's Qualifying Exam Comm.	By September 15	Chair, Res. Prop. Comm.
Approval of proposal outline and Qualifying Exam Comm. roster	By September 30	Representative of the Res. Prop. Comm.
Approval of the full proposal	By October 31	Qualifying Exam. Comm.
Completion of oral exam	By Wednesday before Thanksgiving	Student and Qualifying Exam. Comm.
Submission of report and recommended grade for each student	By Dec. 1	Qualifying Exam. Comm.
Completion of BIOM296 grade sheet	By the end of Fall quarter	Chair, Res. Prop. Comm.
Advancement to Candidacy:		
<i>Task</i>	<i>Time</i>	<i>Responsible parties</i>
Selection of Thesis Comm. Consisting of 5 members, complying with OGS regulation. Submission of the Comm. Roster to the BMS office	BMS recommendation- during Spring quarter of student's second year	Student and Thesis Advisor
Approval of Thesis Comm.	BMS recommendation- No later than the end of Spring quarter of student's second year	OGS
Submission of a written Thesis proposal to the Thesis Comm.	One week before the oral exam	Student and Thesis Advisor

Oral Exam and Submission of Thesis Comm. Approval to BMS office and OGS	BMS recommendation-No later than the end of Fall quarter of student's third year. (Note: OGS deadline- No later than the end of the fourth Summer quarter)	Student and Thesis Comm.
Thesis Defense:	BMS recommendation- no later than the end of Summer quarter in the student's fifth year	
<i>Task</i>	<i>Time</i>	<i>Responsible parties</i>
Pre-defense meeting	BMS recommendation- prior to writing the Thesis	Student and Thesis Comm.
Submission of written Thesis	BMS recommendation- two weeks prior to public defense of Thesis Academic Senate recommendation- four weeks prior to public defense of Thesis	Student
Thesis defense	BMS recommendation- No later than the end of the fifth summer quarter (Note: OGS deadline- No later than the end of the seventh Summer)	Student and Thesis Comm.
Submission of Approved Thesis	(necessary for Degree)	Student

VII. REPORTS AND EVALUATIONS

A. ANNUAL COMMITTEE REVIEW OF FIRST-YEAR PERFORMANCE

The Student Standing, Promotions and Advisory Committee (SPAC) meets periodically to review the performance of each first-year student in laboratory rotations, formal class work and in meeting the degree requirements. At the end of Spring Quarter of the first year, the student's SPAC advisor evaluates the student's performance with a written documentation submitted to the Program office. Where necessary, SPAC advisor consults directly with the student. The importance of this evaluation is emphasized by the fact that it forms the basis of a recommendation to the BMS Chair concerning whether the student should continue in the degree program at the end of the first year.

B. ANNUAL REVIEW OF PERFORMANCE BEYOND FIRST-YEAR

A first thesis committee should be scheduled by the end of summer in the first year with a written evaluation submitted to the Program office. In all subsequent years this evaluation should coincide with an annual thesis committee meeting to be held in the Spring quarter or no later than the end of each summer. This evaluation should indicate the degree to which students are, over all, progressing satisfactorily in their studies; their strengths and weaknesses in research and, where applicable, as teaching assistants. These evaluations should contain cogent and clear advice to students. This evaluation is made available to students to read and respond as desired. A copy of this evaluation is sent to OGS to be made part of the students' permanent files. Students must participate in this annual evaluation by discussing their progress with advisors and thesis committee members and by adding their written comments to the evaluation. When completed, the evaluation must be turned into the BMS staff and reviewed by the BMS chair.

C. SUMMARY OF ANNUAL REVIEW TIMELINE

****** *The students and faculty should note that OGS must have on file a satisfactory Spring Evaluation before financial support for the following Fall Quarter will be approved. *******

<u>Year</u>	<u>Deadline of Review</u>	<u>Responsible parties</u>
Year-1	End of Spring Quarter	SPAC advisors
Year-2	End of Spring Quarter	Thesis Advisors
Year-3	End of Spring Quarter	Thesis Committees
Year-4	End of Spring Quarter	Thesis Committees
Year-5	End of Spring Quarter	Thesis Committees
Year-6 (if applicable)	End of Spring Quarter	Thesis Committees

VIII. STUDENT AWARDS

Students are encouraged to apply for external competitive fellowships. Students who obtain such awards will receive a one-time \$2,000 bonus. (If the student is in their first year and has not joined a lab yet, BMS will provide the bonus. If the student is in a thesis lab, the thesis advisor will provide the bonus.)

In addition, the following awards recognize excellence in the performance of students during their Ph.D. training and are overseen by the BMS Awards Committee:

A. OUTSTANDING DISSERTATION AWARD

The Outstanding Dissertation Award recognizes and rewards a graduate student whose thesis has been identified by the BMS Program Awards Committee, following nomination by the thesis advisor and one committee member, as outstanding among all those submitted during the previous year.

Award

The recipient will receive a cash award of \$500 and speak at the annual BMS retreat.

Eligibility

To be eligible for the award, the nominated student must have defended his or her thesis during the period May 1 2008 - April 30 2009.

Nomination Procedure

The nomination should include nomination letters from the thesis advisor and one committee member. The letter should comment on:

- Clarity and composition of written thesis
- Scholarship demonstrated in the thesis
- Contribution of the thesis to the research

B. OTHER AWARDS

The following awards are also in place *when applicable*:

- Poster awards at the annual BMS retreat
- Best Performance in the first year courses

IX. POLICIES ON STUDENT SUPPORT

The current level of support for BMS students is \$28,000 annually or \$2333/monthly effective September 1, 2008.

During the first year, the BMS program will be responsible for supporting the student's tuition and fees for *three quarters* (Fall, Winter and Spring) and the student's stipend for *10 months* (September through June; or July through April for those students who choose to begin their rotation program prior to the first Fall quarter). Thereafter, BMS students will be supported by their Thesis advisors, by Fellowships, and/or by Training Grants.

The thesis advisor is responsible for the student's support as soon as the student enters the advisor's laboratory. Students should discuss their intentions with potential Thesis Advisors in advance and during the rotation periods to avoid funding problems that would prohibit students from joining the laboratories of interest.

Thesis advisors who support student GSRs (Graduate Student Researchers) at a level of 25% or more are required by UCSD policy to contribute to the campus-wide GSRTF (Graduate Student Researcher Tuition/Fees) pool. This fund is drawn upon to cover the cost of students' UCSD tuition and fees.

The BMS Program does not permit students to have outside jobs, because completion of the Ph.D. thesis research projects will demand the students to devote full efforts. First-year students prior to the selection of a thesis laboratory should not schedule vacations other than the official holidays. Following the selection of a thesis laboratory and for BMS students in every year of study, vacation time that exceeds four working days requires the prior approval of the student's Thesis advisor.

X. TERMINAL MASTERS DEGREE

The BMS program offers a Terminal Master's degree to students who do not complete the Ph.D. requirements but who satisfactorily complete the core and advanced course work requirements, three laboratory rotations, the Research Proposition examination, and have a GPA of at least 3.0 (OGS requirement). Award of the degree requires approval of the student's advisor and the Chair of BMS.

XI. LEAVES OF ABSENCE

A student is expected to be in continuous residence until the thesis is awarded. Absence from the university in excess of four working days for any types of personal reasons require the prior approval of the student's SPAC advisor (prior to selection of a Thesis laboratory) or the Thesis advisor. Vacations can be taken only upon approval by the Thesis Advisor. First-year students should not schedule vacations prior to selecting a thesis laboratory.

A student may request a leave of absence for a maximum of one year when conditions established by the Office of Graduate Studies (OGS) are met. If the student does not return from leave by the OGS deadline date, he or she must reapply for admission. Extension of a leave of absence beyond one year will be made only under exceptional circumstances. Leaves of absence for childbearing and parenting (primary responsibility for care of children under 5 years of age) will be granted for up to three quarters. Approved leaves for these purposes will not count in a full year (3-quarter) leave limit applicable to all graduate students. Professional obligations, e.g. post-graduate training or service by physicians, will not be considered as reasons for extension of a leave of absence. Students who are considering a leave are encouraged to consult with the BMS Director to discuss requirements and options.

GUIDELINES FOR BMS M.D./Ph.D. CANDIDATES

I. ADMISSIONS REQUIREMENTS

M.D./ Ph.D. applicants must meet all requirements for graduate admission to the Biomedical Sciences Program. Students are evaluated during their second year of study for matriculation into the Ph.D. program during their third year.

II. COURSE WORK AND ROTATIONS

- A. M.D./Ph.D. students are required to complete all Biomedical Sciences advanced course work (electives) as required of other graduate students in the program. Graded core courses for first year graduate students in the Biomedical Science Program are not required for UCSD medical students. The applicability of previous course work toward the Biomedical Sciences Graduate Program course requirements will be evaluated on an ad hoc basis. However, elective requirements (15 units total; 8 for a letter grade) are the same for all students.
- B. M.D./Ph.D. students must have conducted research in at least two laboratories of UCSD faculty other than their thesis advisor. Laboratory rotations taken during elective time in medical school can fulfill this requirement. At least one laboratory experience must have been in the laboratory of a member of the BMS Program.
- C. M.D./Ph.D. students are required to successfully complete the Research Proposition Exam during the Fall quarter of their first year of Ph.D. training in the BMS Graduate Program (which would generally be the year after completion of the first two years of medical school). This is a requirement for further advancement in the graduate program. M.D/Ph.D. students are also required to successfully complete the Advancement to Candidacy Exam by the end of their first year in Ph.D. training.
- D. M.D./Ph.D. students must also satisfy the one-quarter Teaching/Outreach requirement as described in Section V of the general guidelines.

III. REGISTRATION REQUIREMENTS

- A. The Graduate Council imposes the following requirements:
 - 1. If in any given quarter a student is spending the majority of his/her time within the graduate program the student must be registered as a graduate student that quarter.
 - 2. To receive the Ph.D. degree a student must be registered as a graduate student for a minimum of 6 academic quarters, three of which are continuous. OGS has waived the requirement that students be registered as graduate students in the

quarter they receive their degree if they are registered in the School of Medicine during that quarter.

- B. The School of Medicine requires, for medical licensing, that students be registered for a minimum of 11 quarters in the medical school.

IV. COMPLETION OF RESEARCH WORK/RETURN TO CLINICAL TRAINING

All requirements for the Ph.D. degree must be completed prior to leaving the graduate program to return to clinical training (including junior year core clerkships). This includes passing of the Research Proposition examination, teaching requirement, Advancement to Candidacy, writing and defense of the thesis, and submission of the completed thesis manuscript to the library, according to OGS guidelines. With the above requirements in mind, a typical quarterly program of registration for an M.D./Ph.D. student in the Biomedical Sciences Graduate Program is shown below. The normal time to degree for M.D./Ph.D. students is 7 years.

SCHEDULE FOR M.D./Ph.D. STUDENTS

Summer	Fall	Winter	Spring
YEARS 1 and 2 M.D.			
Full time registration (M) and course work in School of Medicine 2 or 3 laboratory rotations completed in Summers of years 1 and 2 of Medical School Research Proposition completed during Summer/Fall of year 1 of Ph.D.			
YEAR 3 M.D. (Year 1 of Ph.D.) ☛			
Final Lab rotation (If necessary) (M*) Research Proposition (G)	Thesis Lab (G) Research Proposition (G)	Thesis Lab (G)	Thesis Lab (G) Appointment of an Official Thesis Committee (G) BIOM 219 & BIOM 285 (G)
YEAR 4 M.D. (Year 2 of Ph.D.) ☛			
Thesis Lab (M*)	Thesis Lab (G)	Thesis Lab (G)	Thesis Lab (G)
YEAR 5 M.D. (Year 3 of Ph.D.) ☛			
Thesis Lab (M*)	Thesis Lab (G)	Thesis Lab (G)	Thesis Lab (G) Ph.D. Defense (G)
YEAR 6 M.D.			
Clinical Core (M)	Clinical Core (M)	Clinical Core (M)	Clinical Core (M)
YEAR 7 M.D.			
Clinical Electives (M)	Clinical Electives (M)	Clinical Electives (M)	Clinical Electives (MD)

(M) = Registration in School of Medicine

(G) = Registration in Graduate Program

(M*) = Full time laboratory work, but registration in the School of Medicine

* = The elective courses may be taken at any time during graduate studies

The graduate program does not require registration during the summer; these quarters can be counted toward the School of Medicine 11 quarter registration minimum.

GUIDELINES FOR BMS Pharm.D./Ph.D. CANDIDATES

I. ADMISSIONS REQUIREMENTS

Pharm.D./ Ph.D. applicants must meet all requirements for graduate admission to the Biomedical Sciences Program. Students are evaluated during their third year of study for matriculation into the Ph.D. program during their fourth year.

II. COURSE WORK AND ROTATIONS

- A. Pharm.D./Ph.D. students are required to take the Fall seminar course (BIOM 201) and to complete all Biomedical Sciences advanced course work (electives) as required of other graduate students in the program. Graded core courses for first year graduate students in the Biomedical Science Program are not required for UCSD Pharm.D students. Coursework that the matriculating student will have accomplished during the first three years of the Pharm.D. curriculum, which includes a number of courses offered as graduate electives, will also count toward the overall elective requirements of the program (15 units total; 8 for a letter grade). Thus in general, additional elective graduate coursework during the Ph.D. training will only be undertaken when the student and research mentor jointly conclude that a particular class provides an intrinsic benefit the student in successful completion of the doctoral research.
- B. Pharm.D./Ph.D. students must have conducted research in at least two laboratories of UCSD faculty other than their thesis advisor. Pharm.D./Ph.D. students will be guided to complete these laboratory rotations taken during the summers between the first and second or second and third years of the pharmacy school curriculum to fulfill this requirement. At least one laboratory research experience must have been in the laboratory of a member of the BMS Program. The evaluations of student performance during these rotations will be an important part of the application file for acceptance into the BMS program.
- C. Pharm.D./Ph.D. students are required to successfully complete the Research Proposition Exam during the Fall quarter of their first year of Ph.D. training in the Biomedical Sciences Graduate Program (which would generally be the year after completion of the first three years of pharmacy school). This is a requirement for further advancement in the graduate program. Pharm.D/Ph.D. students are also required to successfully complete the Advancement to Candidacy Exam by the end of their first year of Ph.D. training.
- D. The significant teaching and outreach experience that is comprised within the PharmD curriculum will satisfy the 1-quarter Teaching/Outreach requirement as described in Section V of the general guidelines. Thus Pharm.D./Ph.D. students will not be required

to perform additional teaching or outreach during their research studies in the BMS program.

III. REGISTRATION REQUIREMENTS

- A. The Graduate Council imposes the following requirements:
 - 1. If in any given quarter a student is spending the majority of his/her time within the graduate program the student must be registered as a graduate student that quarter.
 - 2. To receive the Ph.D. degree a student must be registered as a graduate student for a minimum of 6 academic quarters, three of which are continuous. OGS has waived the requirement that students be registered as graduate students in the quarter they receive their degree if they are registered in the School of Pharmacy during that quarter.
- B. The School of Pharmacy requires, for licensing, that students be registered for a minimum of 12 quarters in the pharmacy school.

IV. COMPLETION OF RESEARCH WORK/RETURN TO PHARMACY TRAINING

All requirements for the Ph.D. degree must be completed prior to leaving the graduate program to return to pharmacy training. This includes completion of the Research Proposition and the Advancement to Candidacy examinations, writing and defense of the thesis, and submission of the completed thesis manuscript to the library, according to OGS guidelines. With the above requirements in mind, a typical quarterly program of registration for a Pharm.D./Ph.D. student in the Biomedical Sciences Graduate Program is shown below. The normal time to degree for Pharm.D./Ph.D. students is 7 years.

SCHEDULE FOR Pharm.D./Ph.D. STUDENTS

Summer	Fall	Winter	Spring
YEARS 1, 2 and 3			
Full time registration (P) and course work in the Pharmacy School 2 or 3 Laboratory rotations completed in summers between years 1 - 2 and years 2 - 3 (*P)			
YEAR 4 ☛			
Final lab rotation (if necessary) Research Proposition (P*)(G)	Thesis lab BIOM201 Research Proposition (G)	Thesis lab (G)	Thesis lab (G)
YEAR 5 ☛			
Thesis lab Advancement to Candidacy (G)	Thesis lab (G)	Thesis lab (G)	Thesis lab (G)
YEAR 6 ☛			
Thesis lab (G)	Thesis lab (G)	Thesis lab (G)	Thesis lab Ph.D. Defense (G)
YEAR 7			
Pharmacy (P)	Clinical Core (P)	Clinical Core (P)	Clinical Core (P)

(P) = Registration in SKAGGS School of Pharmacy

(G) = Registration in Graduate Program

(P*) = Full time laboratory work, but registration in the School of Medicine.

* = The elective courses may be taken at any time during graduate studies

The graduate program does not require registration during the summer; these quarters can be counted toward the School of Pharmacy 12 quarter registration minimum.

Appendix – Outreach activities

Academic Connections - SUMMER TEACHING OPPORTUNITY

Academic Connections is an initiative designed to provide high school students access to educational opportunities at UCSD. One of the programs has a summer residential component that gives high school students an opportunity to experience college life. All of the courses were developed and taught by UCSD graduate students. For more details see: <http://academicconnections.ucsd.edu>

Each year, planning for the summer residential program takes place during the fall and winter quarters. Motivated students are invited to submit courses designed for 9-12th grade students, which will engage them academically and take advantage of the University's resources. Special emphasis should be placed on hands-on experimentation. Resources (lab space and supplies) are available for course development. This is a great opportunity for graduate students to gain additional teaching experience, have an impact on the education of future university students, and to share with young students their excitement about their fields and their own desire to learn.

Interested students in the Biomedical Sciences Program should consider courses directly related to the life sciences on any appropriate subject (molecular biology, cell biology, pharmacology and physiology, for an example see www.academicconnections.ucsd.edu/courses/cancer2002.htm). Classes are small (no more than 20 students), and the content should reflect your specific expertise. An optimal situation is for you to work with your mentor to develop the course. Student instructors also work with the director of the program to organize the curriculum and obtain the necessary resources.

The summer program usually takes place in the last three weeks of July. This is an intensive outreach activity that may take 6 weeks of full time commitment (3+ weeks preparation and 3 weeks teaching). Because of the added workload, students should first seek approval from their mentors, and then submit an application to the program. You should also consider working with another student to distribute the workload. Contact Gina Butcher regarding method of payment.

Interested students should contact Academic Connections: Phone (858) 534-0804 or Email: academicconnections@ucsd.edu

Salk Institute Mobile Science Lab

The Salk Institute Mobile Science Lab is a unique program that is bringing hands-on laboratory experiences to middle school children in San Diego County. This program was developed with local teachers and Salk scientists to fill a need for state of the art laboratory activities at the middle school level. The curriculum for the unit was designed to increase both teachers' and students' knowledge of genetics and DNA technology. The traveling science program was made possible through a gift of a natural gas powered van from Pearson Ford and the San Diego County Office of Education.

The curriculum begins with asking the students to examine fruit flies, showing examples of normal and mutant flies and introducing the concept that traits are instructions carried by the genetic material of the organism. Another experiment allows students to learn about the structure of DNA and to extract DNA from a bacterial solution. Students end with learning about gel electrophoresis, the basis for DNA fingerprinting which is used in disease screening as well as in criminal and paternity cases. All the necessary equipment is brought to the classroom. Last year the program visited 13 schools for three days each and worked with 1300 students.

A volunteer staff of faculty, post-doctoral fellows, graduate students and community members help to operate the Salk Mobile Science Lab and the program is designed to accommodate their schedules. One school is visited on Wednesday, Thursday and Friday every other week during the academic year. Most of the teaching activities occur in the morning and ends no later than 1:00 PM.

The requirements for Biomedical Science Graduate Student Mentors consist of two weeks working at two different schools. During the first day, student mentors would learn the material that is covered from someone more experienced in the program and help set up the laboratory. On subsequent days, the student mentors would be encouraged to give the introductory lecture and details of the curriculum for each class. The student would then be responsible for one additional week at another school, organizing the volunteers, setting up of equipment, and presenting the background and curricular materials. The schedule should be arranged so the student mentors can complete their activities within a quarter, so that the mentor is up to date on the material. Interested students should contact Dona Mapston, the Salk Institute, mapston@salk.edu for more information.

SEASAND Summer Content Institutes (SCI)

UCSD is a site of the California Science Project (CSP), which is funded from the UC Office of the President. The site is called SEASAND (Science Education Association of San Diego), and we are committed to the goal of improving science education for all children in San Diego County. In working toward this goal, SEASAND'S mission is to provide opportunities for teachers to enhance their science content knowledge and pedagogical skills, support professional communities for science teachers, develop school-based leadership teams of teachers and administrators committed to improving science instruction, and develop formal partnerships with schools to improve student learning.

SEASAND offers different institutes each summer, generally for 7th and 8th grade teachers. The institutes will be held at UCSD from over a 10-day period with 5 follow-up days throughout the academic year. The institutes will focus both on science content and on teaching science to English Language Learners. Each teaching team will consist of a scientist, a high school teacher, a middle school teacher, and an ELD specialist. In addition, SEASAND is offering two strands in these institutes: peer coaching or curriculum development. In the peer-coaching strand, teachers will learn about various methods of coaching and mentoring. For the follow-up days, teachers will practice peer coaching in teams of four using a lesson study model. Our goal is for teachers in the peer-coaching strand to recruit colleagues into this strand for the following summer, and then to help lead the institutes one year later. In the curriculum development strand, teachers will have the opportunity to work in teams to develop a unit and then teach it in their classrooms. At the follow-up sessions, teachers will discuss the implementation of the units in the classroom based on analyses of student work.

Student facilitators are needed to develop content and to work with teachers in institutes. Expected outcomes would include learning about the education culture (6-8) and development of facilitation skills that are difficult to obtain elsewhere. Student facilitators would help organize and run the laboratory along with teacher leaders. They would actively interact with middle school science teachers and learn inquiry based teaching skills. Students would also serve as role models as young scientists.

Time commitment: This is an intensive out-reach activity lasting approximately 2 weeks in the summer. Activities would include a 1-2 hour orientation to middle school education and teaching; orientation to facilitation education with teacher leaders (3 days, 6 hrs/day); attendance and implementation of an Institute as a student facilitator, 2 weeks, 6 hrs/day. For more information about our project and upcoming summer institutes, please see the following website: <http://create.ucsd.edu/> or call: 858 534-3674.

Intern for the San Diego Science Festival

This position is a unique opportunity for professional development in a scientific outreach context. Students will work with mentors and peers in the public and private sector to develop interactive science exhibits that will engage the next generation of scientists and innovators and the public at large at the first festival of its kind in San Diego.

The first annual San Diego Science Festival consists of a month of educational programs and events around San Diego county in March 2009, and culminates in a weekend-long expo in Balboa Park in early April 2009. Hundreds of exhibits will be developed to intrigue and educate the anticipated 60,000 attendees from the greater San Diego area. The Festival is organized by a diverse collaboration of companies and science advocacy groups (including alumni of the BMS program), and is lead by Mr. Larry Bock, a serial entrepreneur in the life sciences with a great passion for scientific philanthropy, education, and outreach.

More specific information, including a current listing of collaborators, exhibitors, and sponsors, can be found at <http://sdsciencefestival.com>

Student intern responsibilities will vary based on the project and preferences of the individual, but may include working with young aspiring scientists (at the high school or junior college level) on educational outreach programs, developing exhibits with the guidance of mentors from collaborating companies, working on teams to organize specific events and other logistics of the festival, corporate relations with participating companies and sponsors, and more. The guidelines are flexible and creativity is encouraged. Time commitment will be similar to a conventional teaching assistant position: several hours weekly in meetings and independent work, occasional evening and weekend commitments, and additional responsibilities during the final month and weekend of Festival preparation and implementation. Regular documentation of progress and a final report are expected from each intern.

For more information, please contact Nate Heintzman, Ph.D. nheintzm@ucsd.edu