

CAMB HANDBOOK

2009-2010

MATTERS OF CONDUCT AND ACADEMIC INTEGRITY

Code of General Conduct

All students of Biomedical Graduate Studies (BGS) must conduct themselves at all times in a mature and responsible manner. The rights and property of all persons are to be respected regardless of time or place. For dual degree students (MD-PhD, VMD-PhD), or graduate students who conduct research in a clinical venue, this also includes compliance with rules, procedures and accepted practices in the clinical setting. In addition, BGS students must comply with the University's code of general conduct and other University policies related to student conduct that appear in The Penn Book, Policies and Procedures Handbook of the University of Pennsylvania. These policies include, but are not limited to, policies on sexual harassment, acquaintance rape and sexual violence, open expression, drug and alcohol usage, and the drug-free workplace. The judicial charter contained within that document is not applicable to BGS students. The Charter of Biomedical Graduate Studies Student Judicial System which is applicable to graduate and dual degree students within BGS can be found on the BGS website.

Code of Academic Integrity

The most fundamental value of any academic community is intellectual honesty; accordingly, all academic communities rely upon the integrity of each and every member. Students are responsible not only for adhering to the highest standards of truth and honesty but also for upholding the principles and spirit of the following Code. Violations of this Code include but are not limited to the following acts:

A. **Cheating:** using or attempting to use unauthorized assistance, material or study aids in examinations or any other academic work, or preventing, or attempting to prevent another from using authorized assistance, material, or study aids.

B. **Plagiarism:** using the ideas, data or language of another without specific and proper acknowledgment.

C. **Fabrication:** submitting contrived or altered information in any academic exercise.

D. **Multiple Submission:** submitting, without prior permission, any work submitted to fulfill another academic requirement.

E. **Misrepresentation of Academic Records:** misrepresenting or tampering with, or attempting to tamper with, any portion of one's own or any other person's transcripts or academic record, either before or after coming to the University of Pennsylvania.

F. **Facilitating Academic Dishonesty:** knowingly helping or attempting to help another violate provisions of this Code.

G. **Unfair Advantage:** attempting to gain unauthorized advantage over fellow students in an academic exercise.

Code of Clinical Conduct

The relationship of modern biomedical research to the clinical setting may place BGS students in direct contact with patients, patient medical records, or health care workers. BGS students must behave with paramount concern for patients' welfare and with respect for the rights of patients. The expectations of BGS students' conduct in the clinical setting include the following:

A. *adherence to appropriate standards of behavior in the presence of patients;*

B. *adherence to appropriate standards of confidentiality with respect to information about patients;*

C. *honesty in interactions with clinical colleagues and in recordkeeping;*

D. *respect for the limits of responsibility and activity set forth by supervisors;*

E. *appropriate interactions with colleagues and co-workers.*

Graduate Group Administration: 2009-2010

For the 2009-2010 academic year, the CAMB Program Chairs will have primary responsibility for students, including all advising and oversight of prelim exams. Students and faculty should be aware that while they are encouraged to work with the Program Chairs, any issues that cannot be resolved at the program level can be presented to the full CAMB Executive Committee. Such issues should be submitted in writing to one of the CAMB coordinators who will put them on the agenda for consideration at the next Executive Committee meeting. The Executive Committee will meet monthly to review ongoing activities, curriculum, policies, and any student issues that require decisions.

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CAMB Executive Committee

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Dr. Kevin Foskett
Dr. Daniel Kessler

Dr. Gary Koretzky
Dr. Sarah Millar
Dr. Robert Ricciardi

Dr. Andrei Thomas-
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Dr. David Weiner

CAMB Admissions Committee

Dr. Ronald Harty – PhD Admissions Chair
Dr. William Lee – MD/PhD Admissions Chair

CAMB Curriculum Committee

Groups represented

Cell Biology & Physiology

Cancer Biology

Developmental, Stem Cell, and
Regenerative Biology

Gene Therapy and Vaccines

Genetics & Gene Regulation

Microbiology Virology and
Parasitology

First year at large

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Graduate Group in Cell and Molecular Biology

The Cell and Molecular Biology Graduate Group (CAMB) is a broad-based program, designed to provide superior graduate level education in modern cell and molecular biology and thereby to prepare outstanding students for leadership careers in biomedical research. The program has approximately 289 faculty from the School of Medicine, Dental Medicine, Veterinary Medicine, and Arts and Sciences. Currently, 309 graduate students from colleges and universities around the nation and the world are enrolled in the program.

The CAMB Graduate Group offers programs in six related areas of study: Cell Biology and Physiology, Cancer Biology, Developmental, Stem Cell, and Regenerative Biology, Gene Therapy and Vaccines, Genetics and Gene Regulation, and Microbiology, Virology and Parasitology, each composed of faculty with interests focused on similar areas of research. Programs operate fairly autonomously, providing their students with advising, programs meetings, and trainee seminars, among other offerings. Although faculty are members of only one program, many have interests that extend across several of the programs. Students can do lab rotations with any member of CAMB, regardless of program affiliations. Students are assigned a program for administrative purposes during the admissions process based either on their declaration of interest in the program, or our assessment of their interests based on the personal statement. They can change programs at any time prior to the beginning of the second year. Students are required to meet their program's course requirements as well as the overall Graduate Group course requirements within the first two years of study.

Curriculum Overview

The curriculum in the Cell and Molecular Biology Graduate Group (CAMB) is designed to provide superior graduate-level education in modern cell and molecular biology and thereby to prepare outstanding students for leadership careers in biomedical research. Students are asked to select a CAMB program to pursue specialized study in one of the six research areas: Cell Biology and Physiology, Cancer Biology, Developmental, Stem Cell, and Regenerative Biology, Genetics and Gene Regulation, Gene Therapy and Vaccines, or Microbiology, Virology, and Parasitology. Students can easily change programs during or at the end of the first year. First-year graduate students participate in a common core curriculum of courses and seminars designed to provide a strong foundation of knowledge in the fields of molecular biology, cell biology, and biochemistry. In addition, students initiate a series of laboratory rotations designed to provide experience in modern laboratory research methods. Program advisors help students select lab rotation mentors and appropriate courses. Each program offers lecture and seminar courses to provide in depth knowledge in selected areas of research and to give students the opportunity to organize and critically evaluate research findings. There is sufficient flexibility to allow course programs to be tailored to the specific background and research interests of each candidate.

The Ph.D. degree requires:

1. 18 course units (c.u.) derived from lecture courses, seminars, lab rotations and independent study;
2. passing the preliminary examination; and
3. dissertation research and the successful defense of the thesis.

The 18 course units must be completed in the first two years. During the first two years a student typically takes 4 course units each fall and spring semester, and 2 course units in the summer sessions. In May of the second year the student must take the preliminary examination. Upon successfully passing the preliminary examination, the student begins dissertation research.

Program Requirements

Required Core Courses

There are two required core courses for CAMB students, Cell Biology (BIOM 600) and Gene Expression (BIOM 555). Their descriptions are given below. These courses train students in advanced, graduate-level concepts in cell biology, biochemistry and molecular biology. The core courses are generally taken during the first year because they serve as a background for further course work and the preliminary examination. In addition to the core courses all first-year students are required to take the First Year Seminar Course.

- First year seminar course: CAMB 605 (1 c.u.)
- Two core courses: BIOM 555, BIOM 600 (2 c.u.)
- Three laboratory rotations: CAMB 699 (~4 c.u.)
- Five to seven additional lecture or seminar courses; these include specific program requirements and electives. (5-7 c.u.)
- Predissertation Research (CAMB 899) or any of the above (4-6 c.u.)

In the first semester, first-year Ph.D. students may not take elective courses. Students in MVP and GTV must take their program's required course. Their lab rotations will be 1 c.u.. Students in other programs must do a 2 c.u. lab rotation. In the second semester, an additional elective course may be taken, if approved by the student's program, with two 1 c.u. lab rotations. In the second year, students must take at least two courses/seminars each semester in addition to their laboratory research.

Exemptions and modifications:

In rare circumstances a student may have sufficient background to be exempt from the core courses, for example, a student who has received a Master's Degree in an appropriate area of life sciences. Requests for exemption will be considered by the Program Chair and the Executive Committee and will require documentation from the student: grade transcripts plus descriptions and syllabi of courses taken. If approved, credits will be transferred. There will be no exemptions from the three laboratory rotations.

Typical Course Program

Typical Course Program			
	Fall Semester	Spring Semester	Summer Semester
Year 1	BIOM 600, 1st Year Seminar, (CAMB 605) Program Req (if applicable) Lab Rotation	BIOM 555 Program Req or Electives Two Lab Rotations	Lab research
Year 2	Program Req and Electives Lab research	Program Req and Electives Lab research	Dissertation Research
Year 3+	Dissertation Research	Dissertation Research	Dissertation Research

Descriptions of Required Courses

BIOM 555: Eukaryotic Gene Expression

This course covers basic prokaryotic molecular biology and regulation of eukaryotic gene expression including chromatin structure, transcription, DNA modification, RNA processing, translation, post-translational processing, cell cycle and cell death. Offered spring semester.

BIOM 600: Cell Biology

This course covers basic biochemistry and surveys topics of cell biology including: cell structure, compartmentalization and trafficking, signal transduction, cytoskeleton, membranes and membrane transport. Offered fall semester.

CAMB 605: Cell and Molecular Biology First Year Seminar

The seminar focuses on current and classic papers related to research topics of interest to the faculty of CAMB. Students learn to read and critically evaluate the scientific literature and get training in preparing scientific presentations. Multiple sections are each taught by three faculty members from different programs within the Graduate Group. Offered fall semester.

Elective Courses

Each of the six programs makes specific recommendations for appropriate introductory and advanced electives. Requirements and examples of courses for each program are given in Section III below. These courses are subject to change, and new courses are continually being added; for the specific courses given each term, see the current course listings on the BGS web site –

Laboratory Rotations (CAMB 699)

The purpose of the lab rotations is to get experience in specific laboratories that will eventually lead to the choice of a thesis laboratory. Such experience goes far beyond learning techniques; it is an opportunity for the student to determine whether he/she is compatible with the lab and the mentor. Rotations also provide the student with the opportunity to explore areas in which she/he may have interest but no direct research experience. It is recommended that at least one rotation be utilized to explore a field of research that the student may not have previously considered as a future research direction. Students are required to do a minimum of three different lab rotations, and a student can do additional rotations if necessary to find a compatible lab for thesis research.

The minimum period for a rotation is 11 weeks; students often spend a few weeks longer, depending on the term in which the rotation is done. A rotation can be done in the summer before the beginning of the first year or during the summer between the first and second years. Summer rotations before the first year must last for at least 12 weeks. In the 2009-2010 academic year, there will be one 11 week rotation in the fall term, which must start no later than September 28th, and two 11-week rotations in the spring, the first starting no later than January 4th and the second starting March 29th This reflects a change from prior years that was made to try to equalize the length of the three rotations.

All rotations are arranged between the student and the faculty mentor and are subject to approval by the Program advisors. Members of the Graduate Group have provided descriptions of their research, which can be found on the CAMB web site under Faculty. New students should begin thinking about their first rotation before arriving at Penn. Once at Penn, these choices should be explored by talking to students and conferring with Program advisors. The students should then make a short list of faculty with whom they wish to work and set up appointments to talk to the faculty about their research, possible rotation projects and the possibility of working in their laboratories. When a rotation is agreed upon the student and faculty member should meet to discuss and clearly define the goals of the project. A signed "Faculty Agreement for Rotation Monitoring" form (see Appendix) must be returned to the student's program coordinator, and the project should commence as soon as possible. During the first rotation the student should begin planning subsequent rotations. Upon completion of a rotation, the rotation advisor must submit a grade and a written evaluation of the student's performance. An evaluation form (see Appendix) will be provided by the CAMB Office; it will be included in the student's file. A copy of the evaluation will also be given to the student. Students are encouraged to discuss the contents of the written evaluation form with their rotation advisor.

- All rotations must be done in the laboratories of faculty who are members of CAMB.
- A student cannot do two rotations in the same laboratory.
- Laboratory Rotations are very important. Students are expected to be working on the rotation research project at all times not being spent in class or in preparation for class. This should be at least 30 hours a week during Spring and Fall semesters, and 40 hours per week for summer rotations.
- Three rotations are required; there will be no exemptions from rotations.

Grading Guidelines Distributed to Faculty for Rotations:

Please give an A if: The student worked hard on their project, understood what they were doing, produced interpretable results that you trust, and made an intellectual contribution to the lab. Please do not give a grade of A unless you would be happy to welcome them into your lab as a thesis level student and you would be comfortable recommending them to any of your colleagues.

Please give a B if: The student performed well in your lab and you have a reasonable level of confidence that they will be able to accomplish thesis level research leading to a PhD.

Please give a C if: The student performed poorly in your lab and you are unsure whether they will be able to accomplish thesis level research leading to a PhD without significant improvement in their performance.

Combined Degree Students

There are three required courses for combined degree students, BIOM 555 and BIOM 600 (see above) and CAMB 542, Trends in Molecular Medicine. CAMB 542 is taught in the first semester of the first year, concurrent with the first-year medical curriculum. Combined degree students are expected to do two courses or independent study projects (see below), one during the spring of the first year and the other in the fall of the second year. In the third year, combined degree students do a year of full-time course work that includes one of the required core courses plus additional seminar/lecture courses each semester.

Independent Study Projects

Independent Study (CAMB 599) projects provide a less formal means by which first or second year combined degree students can begin their graduate studies. The format of the project is flexible but usually consists of selected readings of the scientific literature and detailed discussion with a chosen faculty member. Often these readings are background in preparation for a lab rotation in the faculty member's laboratory.

It is expected that the student and faculty member will meet weekly to discuss and assign literature articles. At the end of the project the student will either write a paper or make a formal presentation in the faculty advisor's laboratory group meeting. The paper or presentation will be critically evaluated and graded by the faculty advisor. The evaluation (a specific form will be provided, see Appendix) will be placed in the student's file. Independent study projects do not count toward the 7-lecture/seminar-course requirement. Combined degree students may do no more than two independent study projects.

Typical Course Program			
	Fall Semester	Spring Semester	Summer Semester
Year 1	CAMB 542	CAMB 599 (Indep Study)	Lab research

Year 2	CAMB 599 (Indep. Study) or Program Elective	No CAMB activity	No CAMB activity
Year 3	BIOM 600, Program Req or Electives Lab Rotation	BIOM 555 Program Req or Electives Lab Rotation	Dissertation Research
Year 4+	Dissertation Research	Dissertation Research	Dissertation Research

Rotations

Combined degree students must do three rotations. The usual time frame for rotations is as follows.

- The summer before the second year of medical school (required)
- Third year fall term.
- Third year spring term, Jan 4th – March 19th

There is a possibility of completing a rotation the summer before one enters medical school. If a student has completed three rotations prior to the spring semester of the third year, he/she must register for an 11-week period of pre-dissertation research in the chosen thesis lab starting no later than January 4th. No additional lab research in the latter part of the spring semester is required.

Other Requirements

Faculty Mini-talks: All first-year Ph.D. and combined degree students are required to attend a weekly series (non-credit) of faculty research presentations during the fall semester. Each week, selected faculty will give short presentations about their research so that students can become familiar with ongoing research and research opportunities at Penn. In 2009, these sessions will be held on Thursdays at 4:00, in the Austrian Auditorium, CRB.

Symposium. CAMB annually organizes a daylong scientific symposium featuring a keynote speaker, talks by students and faculty and poster sessions. Student participation is mandatory. The 2009 symposium will be held at the University of Pennsylvania Museum of Archaeology and Anthropology on November 9th. The keynote speaker will be Dr. Gerald Crabtree.

Seminars, Student Chalk Talks, and Journal Clubs. Students are expected to participate in the activities of the Graduate Group that are intended to enhance the research environment at Penn. Examples of these activities include Institute, Center or Departmental seminars, student chalk talks, journal clubs, program meetings and training grant meetings. These activities will be advertised by e-mail and mailings to the faculty and students, and are often listed on the CAMB Calendar page.

Bioethics, Radiation Safety, Chemical Hygiene, and Laboratory Animal Procedures. BGS provides training in research ethics to all students on an annual basis. Students in the first year complete their bioethics training on line. Students in their second, third and fourth years participate in small group workshops focusing on case studies in bioethics. Students in years five and beyond have different choices for fulfilling their requirement, which may include attending seminars sponsored by the Center for Bioethics or co-facilitating a workshop for the second and fourth year students. All students must also do laboratory safety training annually, and students working with animals must take the training course in laboratory animal procedures.

Conditions of Fellowship Awards

All full time CAMB students in residence are guaranteed a BGS fellowship that pays tuition, fees and health insurance and provides a stipend for a period of five years as long as the student remains in good academic standing. Funds for fellowships derive from a variety of sources. Students are generally supported by a training grant and/or a University fellowship during the first two years of study and by faculty resources during the dissertation phase. Some students apply for and receive individual extramural fellowships, such as National Research Service Awards or National Science Foundation fellowships, which provide funding for the majority of a student's graduate training. Students are expected to abide by the conditions of their funding source. For example, students appointed to a training grant must complete the required paperwork and participate in activities required by the grant, and students who receive multi-year individual extramural fellowships must prepare and submit annual renewal materials. Graduate students who accept a fully-funded fellowship are expected to devote themselves full time to their program of graduate study. Students may not simultaneously accept another appointment or be employed either within or outside the University. Exceptions may be made only with the written approval of the Dissertation Advisor (if applicable), the Graduate Group Chair, and the Director of BGS.

All University and extramural fellowship awards in excess of tuition, general fee, and required course-related expenses (e.g., required books) are subject to Federal income tax. Even though they are taxable, the University is not required to withhold Federal taxes or issue an IRS W-2 form for non-service (i.e., institutional or training grant based) fellowships. Some fellowships (i.e., those funded by research grants or teaching assistantships) are also subject to Philadelphia city wage taxes, which are withheld from the paycheck. The University is not qualified to provide specific tax information. Students are urged to seek counseling directly from the IRS.

CAMB Academic Calendar/Student Personal Time: CAMB generally adheres to the University's schedule for Fall and Spring course terms but has a 12-month annual training program. University holidays include New Year's Day, Martin Luther King Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, and Christmas Day. The University also gives 4 to 5 "season" days between Christmas Day and New Year's Day. Most BGS courses do not take the University's fall and spring breaks. BGS students are expected to work full-time toward the degree; however, they are entitled to take two weeks off per year for personal time. Students at the dissertation level may schedule time off only with the prior approval of their advisor.

Leaves of Absence: The University allows graduate students to take leaves of absence with the permission of the school only during the period prior to dissertation status (see the Graduate Catalog - Rules and Regulations for more details). Exceptions may be made for dissertation level students, most notably for medical reasons and for parental leave in association with the birth of a child (of up to one year). Student stipends are suspended during a medical leave period and are guaranteed upon return from leave under the conditions of the original award guarantee, i.e., through the initial five-year award period. CAMB students are eligible to receive full pay for new child leave from the same source as the stipend for 30 calendar days. In addition, students may apply the two weeks of annual vacation leave to extend the paid new child leave to 45 calendar days. Beyond that, up to one year of leave may be taken with the remainder unpaid.

Preliminary Examination

The preliminary examination is a qualifying examination given to all second year Ph.D students and all third year MD/Ph.D students in the Cell and Molecular Biology Graduate Group who have completed all Graduate Group and program course requirements. The exam is given to all qualified students in late May or the beginning of June. The intent of the preliminary exam is to determine whether the student is capable of Ph.D. level research. The student must pass this exam in order to be advanced to dissertation status and to remain in the program.

The Proposal

In the Preliminary Examination, the Student proposes and defends a plan for his/her thesis project, or any other project/problem relevant to work in their thesis lab if the student does not yet have a well developed thesis project by the time he/she takes the exam. The Preliminary Examination consists of 2 parts: the written Proposal and the oral Defense. The proposal should be typed in 12 point font, with one inch margins and 1.5 spacing. The total length of the proposal (not including references) should not exceed 16 pages and should have the same structure as an NIH grant. The proposal can be shorter than 16 pages. The organization of the written proposal, along with suggested page lengths, is as follows:

- **Specific Aims (1 page):** State the specific purposes of the research proposal and the hypothesis to be tested.
- **Background/Significance (2-3 pages):** A brief overview of the significant background to the proposal. State concisely the importance of the research described in your proposal by relating the specific aims to broader, long-term objectives.
- **Preliminary Data (2-3 pages):** Preliminary data, if available, should be presented, described and interpreted. The preliminary data need not have been produced by the student, but the source of all data (i.e., self or another lab member) should be indicated.
- **Research Design and Methods (10-12 pages):** The research design and procedures to be used to accomplish the specific aims should be outlined. A tentative sequence for the investigation, the statistical procedures by which the data will be analyzed, and any procedures, situations, or materials that may be hazardous to personnel and the precautions to be exercised should be included. The expected outcome and interpretation of results should be discussed. Potential experimental difficulties should be discussed together with alternative approaches that could achieve desired aims.
- **Human subjects and Animals (1-2 pages):** Provide the rationale for the choice of any human subjects or experimental animals.
- **Literature Citations:** Each citation (numbered in the body of the proposal) must include the names of all authors, name of the book or journal, title of article, volume number, page numbers, and year of publication.

The emphasis of the proposal should not be on a review of the literature but on dealing creatively with the problem selected. The Proposal should be "hypothesis-driven". That is, it should aim explicitly to address a working hypothesis regarding an unresolved issue in Cell and Molecular Biology. It is important to remember that the proposal should describe work that can reasonably be done by one person in 3-4 years, not what an entire lab of people could accomplish in 3-4 years. In this respect, the written Proposal will be more focused than a typical NIH R01 application. It is expected that the proposal will include at least 2 but no more than 3 Specific Aims. This document is only a starting point for the actual thesis work. The approach and experiments can reasonably be expected to change over time with input from the Thesis Advisor and eventual Thesis Committee.

There is an expectation of substantial depth of knowledge in the thesis area, broadly defined. Thus, it will not be sufficient to defend only the particulars of the proposed experiments. A key element of the Proposal Defense will be to explain and defend the importance of the questions to be addressed and to place these questions in the broader context of the field. Thus, in both the Significance section of the written Proposal and in the subsequent oral Defense, the student should be able to marshal knowledge from the relevant literature and from broader areas of Cell and Molecular Biology. Each student's performance will be evaluated on: 1)

quality of the written proposal; 2) quality of the oral presentation; 3) defense of the proposal; and 4) general knowledge of Cell and Molecular biology.

There is no expectation that extensive preliminary data should exist, but whatever preliminary data is available should be included as part of the written document. As noted previously, the source of all preliminary data (i.e., self or another lab member) should be explicitly indicated.

In preparing the proposal, it would be helpful to look at the instructions for the Research Plan section of a Public Health Service grant application (PHS 398) available from the Office of Extramural Research of the National Institutes of Health. To view prior preliminary exam proposals, click below:

[PrelimSample1a.pdf](#)

[PrelimSample2.pdf](#)

Timetable for submission of the Preliminary Exam Proposal:

- **Mid-February:** Meeting with CAMB director to outline requirements for preliminary proposals and answer any questions about procedures associated with the exam. Examples of written proposals will be provided and discussed.
- **April 1:** Each student will submit the title and specific aims of their proposal to their program leader for approval. Also provide a copy to the graduate group office. The specific aims should be no more than one page. The program leader and other members of your program will evaluate the specific aims and get back to the student with approval or suggestions for revisions. If the aims need to be revised the student will return the revised aims to the program leader until they are approved.
- **April 14:** Each student will submit a final detailed outline of the proposal to the program leader and the graduate group office. This does not have to be formally approved by the program leader. However, if significant problems are found the program leader will notify the student. At this point the student should be well prepared to write the final proposal.
- **Early May:** Each student will be informed of the composition of his/her examination committees and date/time of the examination.
- **One week before scheduled exam:** Each student will deliver a copy of their proposal to: the graduate group office, their program leader and each member of their examination committee.
- **The last two weeks of May :** Preliminary examinations are administered.

Requests to delay or defer the exam:

Requests to delay or defer taking the preliminary examination are strongly discouraged; however such requests will be considered by the Graduate Group Chair in consultation with the student's program leader.

Role of Thesis Advisor

The student is encouraged to consult with his/her Thesis Advisor during preparation for the Preliminary Examination. The student is also free to consult with any other faculty, students or postdocs as they develop their ideas. Thesis advisors should not give copies of current or former grant applications to students nor should they edit the student's written proposal. It is the Thesis Advisor's responsibility to ensure that the overall objectives of the proposal are worthwhile. The student can discuss potential experimental approaches with his/her advisor or others.

Composition and duties of examination committee:

The Program Leader or his/her designate. Optimally, the program chair should be present at all exams given for his/her program. If the number of students in a program makes that impractical, the responsibility should

be shared among one or two senior faculty members of the program. The purpose of the Program Leader's or designate's presence on the committee is to be able to compare all the exams with respect to rigor and the decision making processes of the different exam committees. With this information, uniformity in decisions can be established. The final decision for each exam (pass or fail) will be made by the program chair, and then made known to the student by the program chair, either at the end of each day of examinations, or after all exams for his/her program are completed. In making these final decisions the Program Leader, or designate, will consider the committee's recommendations along with the comparative rigor of all the exams. The program leader or designate will be responsible for the evaluation forms (see below) that constitutes the written record for the exam.

Experts: The remainder of the committee will be chosen by the Program Leader and will consist of three faculty members with a reasonable degree of expertise in the area of the proposal. They should be selected to provide a balance between junior and senior faculty.

Thesis Advisor: The Thesis Advisor is explicitly excluded from being on the Preliminary Examination committee for his/her own student and has no role in determining the composition of the committee.

Exam Procedure

Prior to the day of the exam: As indicated in the students' timetable for preparation of the preliminary exam proposal, each student will provide each member of his/her committee with a copy of the proposal. In addition, the CAMB office will provide a copy of the student's file to each examiner. Faculty should read and review both of these documents prior to the exam. If any deficiencies are noted that would indicate that the student has not fulfilled all of the requirements necessary to take the exam, the CAMB office should be notified immediately. Any problems with the submitted proposal should be held for discussion at the committee meeting.

On the day of the exam: The program leader, or designate, will serve as the chair of each examining committee or should ask one of the other members to take on this role. Examinations will be scheduled to allow 1.5 hours for each exam. When the committee has gathered and the members have been introduced to the student, the chair should ask the student to leave the room briefly. The topics to be discussed in the student's absence are:

- The student's overall record. Any deficiencies that might need special attention in the oral questioning should be identified.
- The quality of the written proposal. If the quality is so poor as to be unacceptable, the student can be given a "fail" at this point.
- If the proposal is generally acceptable, any specific deficiencies revealed in the written proposal should be identified and pursued in the oral questioning.
- The "ground rules" for the examination should be agreed upon. The student should prepare a 15 minute presentation. The committee members should decide in advance if they plan to let the student do the presentation uninterrupted or if they plan to interrupt the presentation with questions as they come up. Either format is acceptable, but the student needs to know which will be followed. When the "interrupt" mode is chosen, the discussion might proceed in a direction that does not allow the student to actually complete his/her prepared talk. The student should be assured ahead of time that this might happen and that he/she should not be concerned about getting back to the prepared talk.

The student will then be invited to return to the room. The chair should explain the ground rules to the student and ask the student to begin the presentation. The student may prepare handouts for members of the committee that show results from preliminary experiments. These can be up to three pages in length. With the exception of these, the student will be expected to use the white board if needed. If questioning is slow in getting started, the committee chair should lead off by asking a question. The chair should then turn over the questioning to one of the other examiners. In a rotating fashion the other examiners should question the student.

Exam questions should be designed to probe the student's depth of knowledge on the subject of the proposal, both theoretical and technical. In addition, exam questions should determine the student's general knowledge

of cell and molecular biology especially as it relates to lecture and seminar courses taken and independent study and rotations completed. Special emphasis should be placed on questions designed to elicit the ability of a student to describe how an experiment was or will be done and to interpret it appropriately. When the chairman feels that the student has been examined sufficiently, he/she will ask the student to leave the room while the committee discusses the performance. Each student's performance should be evaluated in four areas: 1) quality of the written proposal, 2) quality of the oral presentation, 3) defense of the proposal, and 4) general knowledge. Each faculty examiner will be asked to fill out a form (see Appendix) providing a numerical assessment of the performance in the four areas on a 1 to 5 scale (1 = outstanding to 5 = unacceptable). Additional narrative comments can also be added. These should include an assessment of the student's perceived strengths and weaknesses. These signed forms are returned to the program chair at the end of the exam. They become part of the student's file. These forms have often been collected in haste after the exam; this should be avoided so that the examiners have time to discuss the exam and thoughtfully prepare their evaluations. The student will be told that the outcome of the exams will be made known at the end of the exams for the program. In most cases this is little more than a day.

Possible outcomes

Pass: This is the outcome for most students. It can represent a range from absolutely stellar performance to a good, generally solid one. It is appropriate to give a pass when the performance is good, but not perfect, and perhaps was not all that the examiners think the student might be capable of doing. All four aspects listed above should come into play in the discussion, and a very strong performance in one area may serve to offset a weak performance in another area.

Conditional Pass: This is meant to be used for students who do well, but perhaps exhibit a significant weakness in a specific, single area. For example, an excellent presentation, oral defense and impressive fund of general knowledge in the setting of a written proposal that is significantly below average could lead to the recommendation of a Conditional Pass. In the event of a "conditional pass" recommendation, the committee must suggest to the Program Chair what the student should be required to do to clear the deficiency (such as rewrite the proposal, do an independent study, etc.) If the student is expected to consult with the committee members individually, this should be stated, and a time frame for completing the remediation should be established. This should typically take less than one month. It is important for the committee chair to put this in writing so that there is no ambiguity about what is being asked of the student. At the end of all the exams the program chair will evaluate and compare all conditional passes to make sure they are fair decisions and to assure that the proposed remedial action is equitable from student to student. When the program chair, or designate, communicates the outcome of the exams, he/she will discuss the conditions of a conditional pass with the student involved.

Failure: This is the outcome when the written proposal is completely unacceptable or performance on multiple aspects of the exam is unacceptable. If the overall performance of the student was weak, or if there were significant deficiencies in more than one of the areas being evaluated, the student should fail the exam. A student who fails will automatically get a chance to rewrite the proposal and defend it at another oral examination. A student who fails the exam twice must leave the program and has the option of obtaining a Terminal Master's Degree (see Terminal Master's Degree below).

Dissertation Phase

The Thesis Mentor

CAMB students must carry out their thesis research under the mentorship of a faculty member of the Cell and Molecular Biology Graduate Group. The Thesis Mentor is the most important individual the student will interact with in the course of their graduate training. For this reason students should carefully evaluate their three rotation experiences in choosing the Mentor. If necessary the student can do additional rotations. At the end of all the rotations the Mentor is chosen and thesis research should commence as soon as possible. The Thesis Mentor is responsible for supporting PhD students beginning June 1st of the PhD student's second year or the MD/PhD student's fourth year. Below are documents from BGS with more detailed financial information.

The Thesis Committee

Within six months of passing the preliminary exam, the student must form a Thesis Committee, and have a committee meeting. Failure to formulate a Thesis Committee within this time frame will result in the student being placed on academic probation. The Thesis Committee must meet at least once a year for Ph.D. students and every six months for combined degree students to monitor the student's progress. The student's Program Chair will monitor the frequency of the meetings.

The Thesis Committee will be comprised of four (or more) faculty (not including the Thesis Mentor), at least three of whom must be members of the CAMB Graduate Group. One of the four faculty is designated as committee chair, and he or she must be a CAMB member. The committee should be constituted to include breadth as well as expertise in the particular research area of thesis work. No more than one faculty member per lab can serve on a student's committee. The Thesis Mentor is a non-voting, ex-officio member of the thesis committee.

The Thesis Committee is the student's advocate and advises the student on scientific direction. It can intervene when there is disagreement between the student and the mentor. The decisions of the Thesis Committee are considered final by the graduate group.

The graduate student and his/her Program Chair shall jointly select the members of the Thesis Committee. The student should submit a list of potential committee members, indicating which faculty will serve as committee chair, to their Program Chair in writing. The Program Chair will respond in writing to approve the committee composition or make recommendations for other candidates. The Graduate Group Chair will adjudicate any disagreement on the composition of the Thesis Committee.

The Thesis Committee and the committee chair must be registered with the Graduate Group Office as soon as it is approved. Students must contact the Graduate Group Office before each thesis committee meeting is held. The Graduate Group Office will then send thesis committee evaluation forms (appendix) to the committee chair. The committee chair will write an overall summary of the committee's decisions. The summary will be returned to the Graduate Group Office to be placed in the student's academic file, and a copy will be forwarded to the student.

Per University policy, students who have not completed all requirements for the Ph.D., including the deposit of the dissertation, within 5 years of passing the preliminary examination cease to be candidates for the Ph.D. unless they satisfy the following re-evaluation process: At a special meeting of the Thesis Committee plus three members of the CAMB Executive Committee, the student will make a 50 minute presentation of work completed to date, plans for future experiments and a detailed timeline for completion. This must be approved by the Thesis Committee and the CAMB Executive Committee. This approval constitutes the "recertification" required by the university.

Guidelines for Maintaining a Laboratory Notebook

BGS has mandated that all graduate groups ensure that the laboratory notebooks of their students are maintained properly. Students are requested to bring their most recent laboratory notebook to each thesis committee meeting. The chair of the thesis committee will appoint a member to review the notebook.

The objective is to ensure that students record their primary data in a way that will allow it to be analyzed appropriately and recovered when necessary. The objective is NOT to monitor the precise content of the notebooks, but to ensure that they are maintained in an acceptable format. There will be a great deal of variation between notebooks, but most notebooks will meet the following requirements:

Notebooks should have bound pages.

Entries should be dated and in ink.

Inserts should be stapled onto pages when practical.

Sufficient information should be recorded so that the reader can determine the objective, design, procedure, and results of an experiment.

The origins or properties of any special reagents used in experiments should be noted.

There should be an organizational scheme, e.g. a table of contents that allows others to locate key experiments.

Primary data not entered into the notebook, like digital files, gels, photographs, microscope slides, animal records, etc. should be indexed in the lab notebook and their location and labeling clearly noted.

If these requirements are not applicable to specific students or projects, we ask that the thesis committee use its best judgment in advising the PI and the student of the best manner in which records should be kept. We ask that notebooks be checked at each thesis committee meeting until the thesis committee feels that the notebooks meet these requirements.

If weaknesses are detected in notebook organization, then the student and PI should receive guidance from the thesis committee on what improvements need to be made. It is the responsibility of the PI and the student to address issues as they arise.

Permission to write and defend the thesis

The Graduate Group requires a dissertation to represent a definitive contribution to scientific knowledge and to show that a student possesses the ability to perform independent research. The Graduate Group feels that the dissertation should contain experimental information that answers a stated question and should display a logical progression of scientific thought. The main information contained in the dissertation should be of a caliber sufficient for publication in a reputable, refereed, scientific journal.

Before beginning the process of writing and defending his/her thesis, the student must convince the thesis committee that thesis research is substantially finished and that the thesis is ready to be written. If the committee agrees that the experimental work is completed and is defensible, the "Permission to Write" form (appendix) must be signed by the committee chair and thesis advisor and returned to the Graduate Group Office. The committee should also agree on a time line that includes an approximate date for the defense. This is necessary to ensure that a time convenient for all committee members can be arranged and that an appropriate room can be scheduled. A draft of the thesis must be presented to each committee member and the CAMB office no later than two weeks prior to the scheduled defense. Failure to do this may result in cancellation of the scheduled thesis defense. Prior to distributing the dissertation to the thesis committee, it must be approved by the thesis advisor. It is typical for members of the thesis committee to ask for alterations prior to the dissertation's final submission; such alterations can be requested at the thesis defense.

The dissertation is the document that summarizes the student's experimental work, formally stating the hypothesis (or hypotheses), the background for forming the hypothesis, and the complete, logical, set of experiments and methods used to prove or disprove the hypothesis. It describes primarily data obtained independently by the student, including those generated from incomplete and/or rotation projects (if desired), but may also describe collaborative work. For the latter, it is critical that the student be the primary author and provide the appropriate acknowledgments to other contributors. In addition to being a personal document, the dissertation is an invaluable lab resource and should be written as such.

The basic outline of the dissertation comprises five sections:

- a) A *General Introduction*, which is intended to review in depth the literature that places all of the work in context and to state the initial hypothesis or hypotheses;
- b) *Materials and Methods*, which should be complete and sufficiently detailed so that others can repeat the experiments without undue literature searches;
- c) *Results*, which typically consists of more than one chapter, with each chapter corresponding to a completed or submitted manuscript or to work in progress. The chapters can contain their own Introductions (these cannot replace the General Introduction described above), Materials and Methods and Discussion sections. The text of these chapters may be more detailed than a completed or submitted manuscript; for example, the Methods should be completely described so that others can repeat the experiments or use the same technology.
- d) *Conclusions/Future Directions*, which summarizes the student's thoughts on what the overall body of work has accomplished and where it might be going. This section is required even if chapters in the Results section have their own Discussions.
- e) *References*. Depending on the overall organization of the dissertation, these can be included at the end of each chapter or at the end of the document.

Following this general outline, the dissertation's overall organization is up to the student in consultation with the thesis advisor and chair of the thesis committee. The written document must conform to the dissertation rules of the University (see the Dissertation Manual issued by the Office of Graduate Studies).

The Thesis Presentation and Defense

The thesis presentation will take the form of a public lecture. The lecture should be scheduled well in advance so that a time convenient to the entire committee can be found and notices can be sent to the faculty and student membership. The Graduate Group Office needs to know the defense date, title of the thesis and place and time of the defense at least three weeks in advance. The Graduate Group Office will then send a public notice to the University community advertising the thesis defense. The Graduate Group Office is responsible for the forms that are required after the thesis defense.

Every effort should be made to have the full four-member thesis committee present at the thesis defense. If a thesis committee member cannot be present at the defense, he/she may provide to the committee chair approval of and/or comments concerning the thesis prior to the defense. If that is not possible, the student is responsible for finding a substitute committee member, with the approval of their program chair. Following general questioning during the public phase of the presentation the thesis defense will commence. The defense is open only to the thesis committee and mentor. The decision on approval of the thesis will be made solely by a majority vote of the committee. The student should anticipate that the committee may require changes to the thesis that could include additional writing, editing and re-evaluation of data. Such changes must then be approved by the committee before the thesis is deposited. For this reason, it is imperative that thesis defenses be scheduled no later than two weeks before the deadline for depositing theses.

Before a student makes the appointment to deposit the thesis, the student must provide the Graduate Group Office with a copy of the abstract page, an original signed copy of the title page, and a mailing address where the postdoctoral training will be done. The Graduate Group Office will then provide the student with a signed 153 form, which must accompany the dissertation to the Graduate Division of Arts and Sciences (GAS).

Graduation Procedures

The Graduate Division of Arts and Sciences sets three graduation dates each year in May, August, and December. A formal commencement ceremony is held in May. The Graduate Group Office will distribute a calendar for each degree period, giving the deadlines for signing up for graduation, and for defending and depositing the thesis. If a student is not able to graduate after they have signed up, they must re-apply for the next degree period. The graduate Group Office will guide students through the thesis submission and graduation scheduling.

A "Graduation Checklist" that includes all of these processes and procedures can be found in the Appendix.

Other Program Information

Advising

All first- and second-year Ph.D. students, and third-year combined-degree students who are in their graduate course year, will meet with a program advisor prior to each semester. The Advisor and Program Chair are responsible for approving the student's class, seminar, laboratory rotation, and/or independent study selections each semester. Any exemptions from the outlined course of study must be approved in writing by the relevant Program Chair. All registrations **must** be done by the CAMB program coordinators.

Academic Standards

The University standard for satisfactory academic progress is a 3.0 grade point average. The minimum standard for final course grades in the CAMB Graduate Group is a "B-". A CAMB student who does not achieve the minimum grade for courses will be referred to the Biomedical Graduate Studies Academic Standards Committee. The Academic Standards Committee will, in concert with the student's Program Chair's recommendations, impose sanctions such as academic probation. In addition, the student's Program Chair may also impose sanctions such as re-taking an examination, re-taking an entire course, continuing course work towards the terminal Master's Degree, or withdrawing from the program. The CAMB Executive Committee will review each case on an ad hoc basis.

Transfer of Credit

Students who have completed graduate work at other graduate institutions may apply to transfer up to eight course units toward the Ph.D. degree. Students who have taken graduate courses at Penn through the College of General Studies (CGS) may apply to transfer up to four course units toward the Ph.D. degree. Courses below a "B" grade will not be considered for credit toward the Penn degree. According to University policy, courses will not be transferred until after a student has completed one academic year of course work in the program.

Transferring into the CAMB Graduate Group

Penn students who are currently enrolled in another graduate group within BGS may transfer into the CAMB Graduate Group. Students should express their interest in joining the CAMB Graduate Group by writing a letter of intent to the Graduate Group Chair. The student will then meet individually with the Graduate Group Chair to discuss any issues related to fulfilling the Graduate Group and program course requirements. Following this meeting, the Graduate Group Chair will decide if the student is in good academic standing and if the student's academic interests and goals are appropriate for the CAMB program. The Graduate Group Chair, in consultation with the Program Chair of the student's program of interest, will provide the student with a written statement of required course work. The student should have the chair of the former program sign a "Transfer of Graduate Group Form" to release the student from the former graduate group and then have the chair of the new program sign the same form to accept the student into the new graduate group. The CAMB Graduate Group Office will request that the student's academic file be transferred from the former graduate group office.

Terminal Master's Degree

The Graduate Group does not admit students for study towards a Master's degree. However, the Graduate Group may award a terminal Master's degree to students who choose not to continue in the program for the Ph.D. degree or to students who fail to pass the preliminary examination or complete their dissertation research.

These CAMB mandated requirements are in addition to conditions imposed by the BGS for a terminal master's degree.

1. Students must have 18 credits completed
2. Student must have a grade of B- or better in their core courses (CELL 600, 555, and 605)
3. Students must submit a paper on their research acceptable to both their PI and program Chair
4. Written prelim proposal is acceptable, in lieu of the paper, with signature of PI and program Chair

Bylaws of the Cell and Molecular Biology Graduate Group

Overall Organization:

The Cell and Molecular Biology Graduate Group is composed of a broad group of faculty drawn from different departments and schools of the University of Pennsylvania and its affiliated institutions. The functions of the Graduate Group are to educate graduate students in the areas of cell and molecular biology and to award graduate degrees to students who meet the standards of the program.

The Graduate Group shall be governed by an Executive Committee and a Chairperson. In addition, there shall be Program Directors responsible for each of six specialized Programs: Cancer Biology, Cell Biology and Physiology, Developmental Stem Cell, and Regenerative Biology, Gene Therapy and Vaccines, Genetics and Gene Regulation, and Microbiology, Virology, and Parasitology.

The Graduate Program Structure

Six Programs currently exist within the Cell and Molecular Biology Graduate Group: Cancer Biology, Cell Biology and Physiology, Developmental Stem Cell, and Regenerative Biology, Gene Therapy and Vaccines, Genetics and Gene Regulation, and Microbiology, Virology, and Parasitology.

Programs exist within the Graduate Group to offer education and training in specific areas of cell and molecular biology. All students must affiliate with a Program and students may switch between programs with the permission of the program chairs involved. A switch between Programs after the beginning of the second year might involve taking additional courses.

Each Program is responsible for the design and implementation of a specialized curriculum appropriate to its specialized topic, the academic advising and supervision of the students in its Program, the supervision of preliminary exams, the organization and supervision of thesis committees, and the organization of program specific activities and events. In addition, each program shall cooperate with the CAMB graduate group in the establishment of a core curriculum, the integration of Program specific curricula with the overall CAMB curriculum, as well as the recruiting and supervision of students.

The organization of these activities may vary by Program, but at a minimum, there must be Program Chair that is elected or whose selection is ratified by the program faculty. The Program Chair will be responsible for organizing program activities and will represent the Program on the Executive Committee.

Establishment or disbandment of Programs shall require approval by two-thirds of the membership of the Executive Committee and must be ratified by more than half of the CAMB faculty members. Changes in the composition of Program specific committees and Program procedures shall be determined by each Program individually.

The Executive Committee and Its Members

1. Function of the Executive Committee

The Executive Committee shall have the responsibility for all Graduate Group-wide activities. These include admissions, overall curriculum development, overseeing faculty membership, interacting with the Biomedical Graduate Studies administration and final authority in student-related matters.

2. Composition of the Committee

The Executive Committee shall be composed of the Chair of the Graduate Group, the Chairs or their designees from each of the six Programs, two graduate student representatives, and a representative from the MD/PhD program nominated by the MD/PhD program director with consultation and approval by the CAMB executive committee. Each Program Chair may bring one member of their faculty to meetings as appropriate.

The Executive Committee shall meet monthly or more often if necessary. Issues discussed by the Executive Committee shall be decided by majority vote. Each program shall have one vote, as shall the Chair of the Graduate Group. A quorum shall consist of two-thirds of the Committee membership including students. On matters pertaining to individual students or faculty, the graduate student members of the Committee shall be asked to absent themselves.

3. The Graduate Group Chair

The Graduate Group Chair will be appointed from the current or past membership of the Executive Committee to a term of three years, to be served at the pleasure of the Executive Committee. A majority vote of the Executive Committee will be required for appointment or dismissal.

The Graduate Group Chair shall preside over the Executive Committee, lead Graduate Group meetings, and serve as one of the three representatives of CAMB to the Biomedical Graduate Studies Advisory Committee. The Graduate Group Chair shall either be one of the Program Chairs currently serving or a former Program Chair who has completed a term in that capacity.

4. The Program Chairs

Program Chairs are elected by their faculty for a term of 3 years. Three months prior to the end of each term, the Program shall inform their primary faculty that the term will be ending. Nominations for Program Chair may be put forward by the Program's executive committee or from any primary member of the Program. Final selection or dismissal of a Program Chair will be subject to a majority of the vote from at least 2/3rds of the Program's primary faculty. Program Chairs may appoint at their discretion a second faculty member to assist them in administering the Program.

Graduate Group-wide Committees and Their Chairs

The following committees serve at the discretion of the Executive Committee.

1. Admissions Committee and Its Chair

The Chair of the Admissions Committee shall be chosen by the Executive Committee and shall report to the Executive Faculty at least once per year.

The Admissions Committee shall be composed of the Chair and at least one faculty representative from each of the six programs. Two additional members shall each be responsible for all applications from under-represented minorities and for international applications, respectively. Faculty appointments are for two years. Committee members review new student applications and develop recruitment strategies. Three members will be designated as members of the BGS Admission Committee with full voting rights. Presentation of favorable applicants to the Biomedical Graduate Studies Admissions Committee may be made by any member of the Admissions Committee.

2. Curriculum Committee and Its Chair

The Chair of the Curriculum Committee shall be chosen by the Executive Committee and shall report to the Executive Faculty at least twice per year.

The Curriculum Committee Chair shall preside over a Committee consisting of one faculty representative and one student from each Program. Appointments are for two years, with half being appointed each year. The Curriculum Committee shall plan and coordinate courses. It is expected that courses will be developed for individual Programs by the Programs themselves and presented to the CAMB Curriculum Committee for approval. The Chair of the Curriculum Committee shall be a member of the Biomedical Graduate Studies Curriculum Committee, as shall any two other faculty members.

3. Events Committee and Its Chair

The Chair of this Committee shall be chosen by the Executive Committee and shall report to the Executive Faculty at least once per year.

The Chair of the Events Committee shall appoint students and faculty chosen from interested volunteers. The Events Committee is responsible for organizing the annual Graduate Group Symposium and other social or scientific events.

Membership in the Graduate Group and in Individual Programs

1. Guidelines for Faculty Membership

Candidates applying for membership in CAMB must have a faculty appointment at the University of Pennsylvania. All candidates must demonstrate, commensurate with their experience, a strong commitment to and competence in PhD graduate training and graduate teaching. All faculty must have an independent laboratory and clearly demonstrated expertise and productivity in Cell and Molecular Biology as judged, for example, by multiple first or last authored publications in highly respected peer-reviewed journals within the field. Faculty applying for membership three or more years after their initial appointment must demonstrate the presence of an active and independent, high quality research program appropriate for the training of graduate students. This can be accomplished, for example, through a distinguished record of publications in the field of Cell and Molecular biology, a history of outside funding, and participation in graduate teaching or graduate group activities.

2. Admission of New Faculty

The following procedures shall be followed for admission to the Graduate Group:

Faculty who wish to join the Graduate Group in Cell and Molecular Biology must submit the following documentation to the Chair of CAMB:

- A current curriculum vitae, including grant support and training record.
- A paragraph (approximately 200 words) describing the faculty's research and two bibliographic reference citations.
- For newly appointed (within two years) and adjunct faculty (faculty with primary appointments outside the University of Pennsylvania), written confirmation that the faculty member currently holds an appointment in a department at the University of Pennsylvania.
- A letter of understanding that specifies the Program with which the applicant wishes to affiliate and states the faculty member's willingness to serve on administrative or examination committees, attend thesis defenses, attend Graduate Group and Program seminars, attend general meetings of the Graduate Group, develop and teach graduate level courses, host seminar speakers, serve as a facilitator for BGS bioethics training at least once every three years, and pay the fee for the annual CAMB Symposium, as well as attend at least one Symposium every three years.

These submissions will be reviewed by the Program Chair and then submitted to the Executive Committee for its approval. The Executive Committee will only accept faculty who are likely to be suitable mentors for graduate students and are willing to contribute to graduate group activities. It is encouraged that the prospective CAMB member contact the relevant Program Chair before formally submitting an application

The Graduate Group Chair will forward the names of accepted applicants to the Director of Biomedical Graduate Studies twice per year: May 15 and November 15. The Biomedical Graduate Studies Office will confirm the applicant's University appointment and send a letter of confirmation of Graduate Group membership.

Once admitted to a specific program, a faculty member may supervise a rotation or dissertation for any student in the Graduate Group, regardless of the Program that the student has selected.

Supervision of graduate students is contingent on demonstrating the capability of supporting a student, should he/she do a thesis in that laboratory. Membership in a Program requires participation in Program-specific and CAMB-wide activities (see Renewing Membership, below).

3. Renewing Membership in the Graduate Group

Each new appointment and reappointment to the Graduate Group is for a three-year term. The term may be renewed for another three years by the Executive Committee. In order to qualify for renewal of membership, an individual must meet the service requirements outlined below and maintain a strong independent research program suitable for the training of graduate students.

Each Graduate Group member must complete an average of 50 service hours per year over a three-year period. Graduate Group and Program chairs, training grant principle investigators, and course directors are exempt from the teaching and administrative service requirements.

- **Teaching/Academic Committee Service:** A minimum of 15 of the 50 hours must be devoted to teaching and/or service on academic committees. Teaching is defined to include directing courses, preparing and giving lectures, other course preparation and in-class time, grading, and the like. Academic committee service includes participation in preliminary exam and thesis committees. This service category does not include supervision of a rotation or dissertation student.
- **Administrative Committee Service/Supervision of Students in the Lab:** The remaining hours per year must be performed in areas such as serving on administrative committees and supervising rotations and dissertations.
- **Bioethics Training:** Each faculty member must participate in a bioethics training program at least once during each three-year term. This requirement may be met by serving as a discussion leader of a BGS Bioethics Workshop; other options for participation include attending other relevant BGS-approved University bioethics courses or symposia.

Documentation for the evaluation will be provided by annual surveys submitted by each faculty member to the CAMB office and by written confirmation of faculty teaching contributions generated by the Curriculum Committee. Failure to provide the necessary information in a timely manner could be construed as a failure to meet the service requirements of the graduate group.

The Executive Committee, advised by recommendations of the Program Chairs, shall make decisions regarding membership. A faculty member whose membership is not renewed may appeal the decision to his or her Program Chair. The Executive Committee will vote again on reappointment after this meeting.

Graduate Group Reviews

In accordance with BGS policy, each graduate group shall be reviewed every six years.