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*Images by Larry Millet, Ph.D. graduate of Dr. Martha Gillette’s lab.
Cell and Developmental Biology Graduate Program

Overview of the Cell and Developmental Biology Graduate Program
The Cell and Developmental Biology (CDB) faculty together with the Graduate College have established the requirements necessary to achieve the Doctor of Philosophy (Ph.D.) degree in our program. You should familiarize yourself with our expectations for maintaining satisfactory academic progress as well as meeting the Graduate Degree Milestones. Your enrollment in our graduate program marks the transition in your education. As you are developing your research and teaching skills, we expect that you, together with your faculty thesis advisor and Thesis Committee Members, will take responsibility for achieving the goals of the graduate program. Success depends on achieving the Graduate Degree Milestones and completing degree requirements in a timely manner.

Departmental Requirements
The CDB Graduate Program Committee evaluates factors that determine satisfactory academic progress. Failure to meet these requirements can result in the committee recommending to the Graduate College that the student be placed on probation or dismissed from the Graduate College. In particular, a student who fails to meet CDB Graduate Program Milestones in a timely fashion will be put on a departmental or Graduate College hold. This means that the student will not be given a research appointment (will not be paid) until the deficiency is corrected.

Maintaining Satisfactory Academic Progress in the Program
Graduate students must make satisfactory progress in all aspects of their program in order to continue pursuing a graduate degree. Factors the CDB department uses to determine satisfactory academic progress include the following:

- Satisfactory performance in course work and maintenance of at least a 3.00 GPA
- Satisfactory performance on the Preliminary Examination
- Satisfactory performance in the required Teaching Assistantship
- Satisfactory and timely completion of all CDB Graduate Program Milestones
- Satisfactory completion of the Final Thesis Defense and Thesis Deposit

Cell and Developmental Biology Graduate Degree Milestones

1. Hold the Preliminary Exam during April of the second year.
2. Choose a Thesis committee, within two months of successfully completing the Preliminary Exam.
3. After successful completion of the Preliminary Exam, present an Annual Departmental Student Research Seminar no later than May 1 each year. International students must pass the EPI by the end of the third year.
4. Submit a written Annual Student Review no later than May 15 each year.
5. Hold a pre-defense meeting with the members of the Thesis Committee to evaluate student progress approximately six months prior to the date of the final thesis defense. This meeting can take place in conjunction with the student’s required annual oral presentation and meeting with the thesis committee.

6. Prior to graduation, all CDB Ph.D. graduate students are required to publish significant findings of their primary thesis research, as a first author, in peer-reviewed journals.

7. Hold the Final Thesis Defense no later than 5 years after completion of the Preliminary Examination. Students must have special written permission from the Department to continue graduate studies beyond the maximum of seven years. Please note that if the final defense is held more than five years after the preliminary exam is completed, the student must retake the Preliminary exam before graduation. In addition, M.D./Ph.D. students have a maximum of 7 years to hold the thesis defense once they have passed the Prelim exam. Ph.D. graduate students have a maximum of 7 years to complete their degree once they are admitted into the Graduate Program. (MSP, MD/Ph.D. students have a maximum of 10 years without explicit Departmental permission).

1. Courses and Student Evaluations

**First Year: Courses, Rotations, and Choosing a Permanent Laboratory**

**Required Graduate Course Registration and Credit Hours**
Each student is required to register for a full-time credit load including summer until CDB program requirements are completed. Please ask your advisor or the Graduate Student Committee chair for the number of course and research credit hours to enroll in each semester.

**Credit Categories**
To obtain the Ph.D. degree a student must complete at least 100 hours of graduate credit. This includes a total of 21 hours of graded formal course work with at least a B average (3.0).

This formal course work includes **17 h of required courses** (detailed below), and **4 h of approved elective coursework**.

*In addition* each student must complete, with a satisfactory grade (15 h total):

- MCB 581, 582, and 583, Laboratory rotations (3 h each)
- CDB 595A, Departmental Seminar (1 h each semester)
- CDB 595C, Graduate Student Seminar (1 h each semester)

CDB Students are required to register for and attend *both* CDB 595 seminars every semester; these credits are only counted toward the 100 h total prior to completing the
Preliminary Exam. Therefore the rotations and CDB 595 credits together will typically total 15 h.

In addition to the 21 h of formal coursework and the 15 h (rotations + seminars) described above, at least 64 hours of thesis research credit, CDB 599, should be completed to achieve the total of 100 required credit hours. The 64 h of thesis research credit will remain deferred (DFR) until the student successfully completes Graduate College and Departmental Ph.D. requirements.

**Required Courses (17 h):**

Year 1:
- MCB 501 Advanced Biochemistry 4 h.
- MCB 502 Advanced Molecular Genetics 4 h.
- MCB 580 Research Ethics & Responsibilities 1 h.
- MCB 493 ACB Special Topics in CDB Advanced Cell Biology 3 h.
- MCB 493 GGB, Genetics and Genomics Applications 3 h

Year 2:
- MCB 529 WRI: Scientific Writing 2 h

**CDB Rotations (3 h each, 9 h total)**

Every first year MCB student must complete three 5-week rotations during the fall semester. The student will be enrolled in MCB 581-583 for credit. Students who rotate in CDB laboratories must fill out the CDB Rotation Summary Form after each rotation.

**Choosing a Permanent Laboratory**

By the end of the third rotation each MCB student should choose a permanent laboratory from among the three laboratories through which he or she rotated during the semester. The choice must be approved by the proposed Faculty mentor according to the rules of the MCB Graduate Program. If it is not possible to join one of the three laboratories through which the student has rotated, the MCB Graduate Program Committee Chair will assist the student in finding a laboratory in which to do a fourth rotation.

**An Incomplete List of Elective Courses**

Elective courses may be chosen from any MCB course at the 400 level or above, including Lecture Courses, Seminars, and Laboratory Courses; these should be selected to build skills and knowledge in consultation with the advisor and/or Thesis committee. Courses outside MCB may also be chosen if they bring knowledge or skills required for the Thesis work and are approved by the Graduate Student Program Committee Chair.

**Lecture Courses:**
- MCB 400 Cancer Cell Biology 3 hrs
- MCB 401 Cell and Membrane Physiology 3 hrs
- MCB 402 Systems and Integrative Physiology 3 hrs.
- MCB 408 Immunology 3 hrs.
MCB 410 Developmental biology 4 hrs.
MCB 413 Endocrinology 3 hrs.
MCB 419 Brain, Behavior and Information Processing 3 hrs.
MCB 432 Computing in Molecular Biology 3 hrs.
MCB 446 Physical Biochemistry 3 hrs.
MCB 480 Eukaryotic Cell Signaling 3 hrs.

**Graduate Seminar and Special Topics Courses:**
- MCB 529 Special Topics in Cell and Developmental Biology 1-4 hrs
- MCB 530 Reproductive Physiology Seminar 2 hrs.
- MCB 555 Analysis of Biochemical Literature 2 hrs

**Laboratory Courses:**
- MCB 403 Cell and Membrane Physiology Laboratory 1 hr.
- MCB 404 Systems and Integrative Physiology Laboratory 1 hr.
- MCB 533 Reproductive Physiology Laboratory Methods 1-3 hrs.

**International Student Oral English Proficiency Testing**
Graduate students for whom English is not their native language must achieve a score of 5 or higher on the English Proficiency Interview (EPI). **It is the student’s responsibility to take the EPI during the first year in the CDB Program.** Students must register for any subsequently required ESL courses. Students, who do not pass the EPI after three attempts, will be dismissed from the CDB program. **CDB students must pass the EPI before the end of the third year.**

**Special Requirements of MD/Ph.D. Students**
The Medical Scholars Program provides an academic environment for integration of graduate and medical education and expects students to precede at an appropriate pace through their dual degree studies. The time scheduled for meeting the various milestones (preliminary examinations, course requirements, National Board examinations, and the like) will be based on established guidelines in consultation with the student and their graduate advisor. It is recognized that individual programs of study may vary greatly with respect to sequence due to factors such as differences in requirements among graduate programs, funding considerations, and the nature of the research. Consequently, petitions for exceptions to the policy may be approved by the Director of the Medical Scholars Program.

In order to assure both integration and reasonable academic progress:

1. All MSP students begin their studies in full-time graduate course work and/or research. Exceptions are granted for students already enrolled in medical studies and may be granted for students already enrolled in graduate study in the department in which they intend to do their PhD at the time of admission to the MSP. Students are encouraged to take M1 classes while completing their graduate program requirements.
2. Students are expected to complete the Ph.D. requirements prior to initiating the second year (M2) of the medical curriculum. Exceptions to this policy require explicit permission from the graduate thesis advisor and the MSP Director. The graduate advisor might also wish to consult with the student’s thesis committee.
3. M.D./Ph.D. students granted exceptions to policy 2 above must progress to Stage III of their graduate program prior to participating in more than one clerkship rotation in the medical curriculum.
4. As per COM policy, MSP students must pass all M-1 courses taken during each academic year including summer makeup examinations. Students must repeat all M-1 courses taken to date if students fail any component of the M-1 curriculum.

Second Year: Preliminary Exam and Choosing a Thesis Committee

Role of the Preliminary Exam Committee
CDB appoints a Faculty committee to administer Preliminary Exams for all students, to be completed in April of their second year. The Preliminary Exam committee for each student will consist of four faculty members. These will include three members from the CDB committee, appointed for each student by the Department. In addition, one committee member must be chosen from outside the Department. The members of this committee will not necessarily be made up by the same members serving on the student’s Thesis Committee (see below). During the second year, prior to the Preliminary Examination, the committee members will be formally approved by the Graduate College.

The Graduate Preliminary Exam Committee Chair(s) will meet with all second year students at the beginning of the Spring semester to provide information about the Examination.

Role of the Ph. D. Thesis Committee
The Thesis Committee is established after successful completion of the Preliminary Exam. At any time, if necessary, it is possible to replace a member of the Thesis Committee, with permission from the CDB Graduate Program Committee and subsequent approval of the Graduate College. The Thesis Defense Committee will include the student’s research advisor, who will serve as the Director of Research. Until the defense, another committee member will serve as Chair. The Chair of the Final Defense Committee is usually, but does not have to be, the student’s research advisor.

Choosing the Ph. D. Thesis Committee
Each student, in consultation with the thesis advisor, will submit the names of three additional professors for the Thesis Committee to the CDB Graduate Program Committee no later than two months after completion of the Preliminary exam. Three members of the committee must be CDB faculty members, at least two of the members must have attained tenure, and the fourth member must be from outside the department. The student's advisor is formally a member of the Ph.D. thesis committee.

It is the student's responsibility to ask potential committee members to serve on the committee, obtain faculty signatures on the CDB Thesis Committee Approval Request Form, and choose the chair of his or her committee. The chair must be a tenured CDB
member other than the thesis advisor. The CDB Graduate Program Committee will need to review and approve the prospective Thesis Committee and notify the student of the approvals. The CDB Graduate Program Committee may also suggest an alternate member. The student must inform the outside member of his or her role on the Thesis Committee.

The Thesis Committee will meet yearly to evaluate the student’s progress and to provide advice. Each Ph.D. candidate will give an annual research seminar. All members of the committee, including the thesis advisor, are expected to attend the student’s seminar and a meeting each year, usually held immediately after the presentation, to provide feedback and advice to the candidate.

**Second Year: Holding the Preliminary Examination**

**Preliminary Examination**
The Preliminary Examination is required by the Graduate College to determine if the student is qualified for advancement to candidacy for the Ph.D. degree. This examination consists of two parts: a written proposal and an oral defense planned for no more than 20 uninterrupted minutes (although the student may indeed be interrupted with questions during the presentation) with 15 slides maximum of that proposal.

The student must complete both parts of the Preliminary Examination no later than the end of the second week in April of the second year in the graduate program. The graduate secretary will arrange the date, time, and place of each second year CDB student Preliminary Examination. All oral examinations will be scheduled for two and a half hours at an acceptable time during the first two weeks in April. Once an acceptable time is arranged, the graduate secretary will inform the student and Preliminary Exam Committee members of the date, time and place.

The student must prepare a research proposal describing his or her thesis project. It is the student’s responsibility to write their own proposals. However, the advisor must read drafts of these documents and provide both intellectual guidance and editorial feedback to help the students learn how to undertake good scientific writing.

The written proposal should be no longer than 7 pages in length (excluding the cover page and references). The written proposal must be filed with the CDB departmental office at least two weeks prior to their scheduled exam and no later than March 31 of the second year in the graduate program. The format of the written proposal will be checked by the graduate secretary prior to distributing the paper to the Preliminary Exam Committee Members. The layout must follow that detailed on page 8 of the CDB Graduate Handbook or it will be returned to the student. If the layout is not approved the exam will be deferred.

Once the format is approved by the graduate secretary, the student should submit five (5) printed copies and the graduate secretary will distribute to the Preliminary Exam Committee members. It is not acceptable for the student to submit preliminary exam proposals directly to their committee members, at any time after they have submitted their
original papers to the CDB office. All papers must be submitted to and approved by the CDB office. Each committee member will read the written proposal prior to the scheduled exam, and has the option to provide feedback regarding both format and content to the student prior to their examination. Such feedback may be provided at the time of the student’s examination. Should the paper require revision due to formatting errors, the Preliminary Exam Committee has the option of deferring the student’s exam or allowing the student to revise the paper prior to the original date. *The exam will be deferred if the revised paper is not properly formatted.*

A formal checklist will be used to assist in the evaluation of the student’s performance at this exam (a sample copy of this checklist is included in the Appendix). A copy of the blank checklist will be made available to the students early in the spring semester to help them prepare for the exam. On the basis of the written proposal and the student’s oral presentation, the committee will evaluate the proposed research, the student's background and grasp of any relevant material, as well as the student's ability to communicate effectively and to think critically about his/her research project.

The student must be able to describe clearly the rationale for the experiments, to summarize preliminary results, and to defend conclusions based on this work. The student should be prepared to explain all aspects of the project, including other studies relevant to the proposed research (i.e., relevant background and literature), all proposed experiments and techniques needed to undertake this research. On the basis of the written proposal and the oral presentation, the committee will evaluate the student's progress and potential to carry out Ph.D. degree-level research. *At the conclusion of the examination* the committee will read and discuss the annual student reviews provided by the student’s mentor. The committee must then reach a consensus decision and declare that the student has either passed or failed the examination, or whether this decision has been deferred. At the end of the meeting each member of the committee must sign the Graduate College Form, which notifies the College of the results. *The form must be returned to the College that same day via the CDB departmental secretary.*

Following the meeting, the committee will meet with the student to explain their decision. The Chair will compose a letter of evaluation, and submit a completed green CDB Graduate Student Feedback form to the student and advisor *no later than one month following the examination.*

The ruling of the Committee will have direct implications in terms of the student’s academic status. Students who do not pass the exam will be placed on probationary academic status, and must remediate the underlying conditions within six months, or will be considered for removal from the CDB graduate program. *If a student is deferred, the committee may recommend writing revisions, or revisions plus a new committee meeting, to be completed by the middle two weeks of the following September at latest. If a student fails the Preliminary Examination, the student must re-take the entire Preliminary Examination during the middle two weeks of the following September, unless the committee specifies otherwise.*
If a student is deferred or fails the Preliminary exam then fails the Exam a second time, they will be dismissed from the Graduate College. A student must pass the Preliminary exam the second time in order to remain in the Graduate Program. After successful completion of the Preliminary Examination the signed “Preliminary Exam Result (PER)” form will be sent to Graduate Student Academic Services by the departmental secretary the same day.

**General Format of Preliminary Examination**

The format of the written proposal will follow that of the NIH F31 individual pre-doctoral fellowship application, which specifically includes the Specific Aims and Research Strategy sections. The guidelines for those sections are listed below, and come from NIH publication PHS SF424 (R&R). Page limits are indicted below.

For fonts use Arial, Helvetica, Palatino Linotype, or Georgia typeface, a black font color, and a font size of 11 points or larger. (A Symbol font may be used to insert Greek letters or special characters; the font size requirement still applies).

Type density, including characters and spaces, must be no more than 15 characters per inch. Type may be no more than six lines per inch.

*Use standard paper size (8 ½”x11”). Use at least one-half inch margins (top, bottom, left and right) for all pages. No information should appear in the margins.*

**Proposal Sections**

1.  **Cover Page:**
The cover page should include the title of the project, your name, the date, time and place of the meeting, and list the members of the Exam Committee; with the designated Chair specifically indicated (the chair will be established by the Department).

2.  **Specific Aims (limited to one page):**
State concisely the goals of the proposed research and summarize the expected outcome(s), including the impact that the results of the proposed research will exert on the research field(s) involved.

   *(Note, this section outlines the objectives and describes concisely what the specific research described in the proposal is intended to accomplish and an hypotheses to be treated.)*

3.  **Research Strategy (limited to 6 pages including all figures and tables):**
Organize the Research Strategy in the specified order and using the instructions provided below. Start each section with the appropriate section heading – Significance, Innovation, Approach (and alternative approaches). Cite published experimental details in the Research Strategy section and provide the full reference in the References Cited section.

   *(a) Significance*

   *Explain the importance of the problem or critical barrier to progress in the field that the proposed project addresses.*
• Explain how the proposed project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields.
• Describe how the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field will be changed if the proposed aims are achieved.

(b) **Innovation (the Innovations section is optional)**

• Explain how the application challenges and seeks to shift current research or clinical practice paradigms.
• Describe any novel theoretical concepts, approaches or methodologies, instrumentation or interventions to be developed or used, and any advantage over existing methodologies, instrumentation, or interventions.
• Explain any refinements, improvements, or new applications of theoretical concepts, approaches or methodologies, instrumentation, or interventions.

(c) **Approach**

• Describe the overall strategy, methodology, and analyses to be used to accomplish the specific aims of the project. Include how the data will be collected, analyzed, and interpreted.
• Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the aims.
• If the project is in the early stages of development, describe any strategy to establish feasibility, and address the management of any high risk aspects of the proposed work.
• If an applicant has multiple Specific Aims, then the applicant should address Significance, Innovation and Approach for each Specific Aim individually. You should also incorporate information on any of your Preliminary Studies that pertain to each Specific Aim within the Significance and Approach subsections, where this is best suited.

(Note, this section should include some background to the present proposal, critically evaluate existing knowledge, and specifically identify the questions that the proposal is intended to answer. State concisely the importance of the research described in the proposal and broad, long-term objectives as this relates to each of the Specific Aims. This section outlines the experimental design and the procedures to be used to accomplish the specific aims of the project. Include the means by which the data will be collected, analyzed, and interpreted. You may describe any new (innovative) methodology or assay and its advantage over existing methodologies. Discuss the potential difficulties and limitations of the proposed procedures and alternative approaches to achieve the specific aims.)

4. **References cited (No page limits):**
This section provides full literature references, following the standard format, which includes the authors’ names (in the correct order, as published), year of publication, title of the manuscript, title of the journal in which the work was published, volume and page numbers.
Third Year and Beyond: Annual Student Seminar, and Thesis Defense

Annual Departmental Student Research Seminars and Student Reviews
Each year the Ph. D. candidate will present a Departmental Research Seminar, and will meet with the Thesis Committee to discuss the student's progress and future research directions. This meeting will generally be scheduled for a time immediately following the annual seminar, but must take place within one month following the research seminar. Each Ph.D. candidate must present his or her annual seminar and meet with the Thesis Committee no later than May 1 each year.

A. Annual Student Seminar Presentation
The presentation should be planned for 20 minutes allowing 10 minutes of discussion. Each talk should include a brief but informative synopsis of

- Background and Significance of the project
- Results to date with emphasis on progress the student has made over the year
- A brief summary of future goals

The purpose of these talks is to

- Provide valuable experience for the student in developing and honing their public presentation style
- Inform other students and faculty of the student’s research, and
- Allow the student to receive constructive input from the CDB community.

The talks should be styled as if for a conference, to a broad audience that is generally knowledgeable but not specifically expert in the student’s field. The student’s committee and mentor are expected to attend this talk and provide feedback to improve presentation skills. The student should provide enough background that the audience can appreciate the scope of the problem and past work, but focus mainly on the progress that has been made since the student’s last presentation.

B. Written Documents for Annual Review

1. All students, after completion of the Preliminary Exam (beginning third year)

Each student is required to prepare a written Progress Report for the annual committee review, and submit to the CDB office and committee I week before the student’s presentation. This document should include two pages total:

- A Specific Aims page, updated and revised from the version used in the Preliminary exam. The page can be substantially revised if project goals have changed since the exam was taken.
- An outline highlighting progress and challenges over the past year.
The student is required to submit his/her progress report to the committee one week before the committee meeting is to be held. The committee will not meet to complete the required annual review unless these documents have been submitted. Short delays in submitting the report and scheduling the meeting may be permitted under special circumstances but must be negotiated with and approved by the committee in advance. Students are required to complete the writing, and to have scheduled a follow-up committee meeting, at latest within 1 month of the student presentation date.

2. Students in the fourth or later years

In addition to the 2-page summary, students in their fourth year or beyond must present his or her Thesis Committee with evidence of a publication, either in preparation, submitted or accepted/published, one week prior to the time of the student’s annual oral presentation. If a student has not yet published findings of their research, a draft of a manuscript must be submitted to the committee to allow evaluation of student progress towards the publication requirement. This draft must be provided to the members of the Committee and the CDB Departmental Office one week prior to the student’s required annual oral presentation.

During the annual review meeting, the committee will then make an assessment as to whether the student is on track to publish significant findings of their research, and hence, may remain in the graduate program. Students who fail to meet these requirements will be placed on Academic Probation.

At a minimum, the manuscript draft submitted to the committee should contain:

- An abstract
- A polished Introduction, describing the purpose of the research and the background that led to the current studies. Key references should be cited.
- Materials and Methods: An outline with key references, describing the approach and key reagents.
- An outline of the major points of Results, with a list of prospective figures. Polished figures with legends and a brief assessment of the relevant findings should be included as they become available.
- Expected outline of major points for a Discussion.
- A bibliography, listing references used in sections above.

If the paper has not been published after the first year it is submitted, the student may update with new results and resubmit to the committee in subsequent years. Otherwise a final version should be submitted. Once a student has completed and published one first-authored manuscript, outlines or drafts of additional papers should be submitted to the committee as they become available, to allow feedback and an assessment of the student’s progress toward the degree.

Students who do not meet these requirements will receive an unsatisfactory annual review. These students will be considered to be in unsatisfactory standing within the CDB
graduate program until the situation is resolved to the satisfaction of the committee. Students in this status will not be eligible for TA-ships or other forms of departmental support.

C. Annual review meeting

The annual review meeting will take place preferably immediately after the student seminar and should involve all committee members if possible. The Chair must be present, and the student’s advisor is also expected to attend. Regardless of whether the advisor is able to attend the meeting, he/she should submit a letter summarizing the student’s progress to the CDB office a week before the review.

1. Format of the meeting:
The purpose of this meeting is to give committee members a chance to evaluate the student’s progress toward the degree. However, it is also a forum for students to gain valuable technical and scientific advice. Students should come prepared with slides describing the following:

- One slide summarizing key points of previous progress and current hypotheses
- Results in the past year: one summary slide highlighting key data points; the student should also bring slides showing each of these key results. The committee may decide which data slides to review in depth
- One slide summarizing plans for the upcoming year
- A timeline, with currently projected times of paper submission, project completion, and thesis defense

2. Evaluation
a. The committee Chair should write a letter summarizing the committee’s evaluation of the candidate’s progress and approved by all committee members, no later than 2 weeks following the student’s meeting. The letter should be submitted to the CDB office and will be forwarded to the student.

The letter should include each of the following components:

- Overall Assessment: of the student’s progress, presentation, and written documents
- Strengths and Weaknesses: in concise summary
- Constructive advice on how to address any major concerns

b. An overall rating of “satisfactory” or “unsatisfactory” should be provided by the committee and included at the top of the letter each year.
“Satisfactory” progress should be assigned to students who have:

- Met obligations regarding submission of required documents
- Provided adequate information to their committee, responded knowledgably to questions, and responded to concerns from previous years
- Made overall satisfactory progress (despite normal research setbacks and possible issues) toward their degree.

“Unsatisfactory” should be reserved to students who:

- Fail to submit their required documents, and fail to complete the meeting with their committee
- Fail to provide adequate information to their committee, fail to answer critical questions knowledgably, or fail to respond to concerns from previous years
- Fail to make adequate progress toward their degree, due to problems beyond normal research setbacks and technical issues.

Annual Overview Evaluation of Student Progress

The CDB Graduate Program Committee will review the progress of each student annually from information gathered from the student, his/her research advisor and the Thesis Committee. During the first year, before the student has chosen a Thesis Committee, the student’s annual review will be based on a letter from the research advisor and information gathered from the student. Every CDB student and his/her advisor will fill out a blue Annual Review Form and submit it to the CDB Graduate Program Committee no later than May 15 each year.

Ph.D. Thesis (Dissertation)

An acceptable thesis should describe discoveries of sufficient quantity and quality to constitute publication in peer-reviewed journals with the Ph.D. candidate as first author. Prior to graduation, all CDB Ph.D. graduate students are required to publish significant findings of their primary thesis research, as a first author, in peer-reviewed journals. A thesis is organized around the publications; each publication can become a thesis chapter. Explicit acknowledgment of any published work pertaining to their research should be included in the thesis. In addition to these experimental-results chapters, the thesis should have a separate introduction chapter, a separate conclusions chapter, and detailed experimental procedures for any non-standard methods used. The conclusions should evaluate the material covered in all of the experimental results chapters and put the work succinctly in context of the appropriate field(s).

Pre-defense Meeting

Each student should meet with the Thesis Committee approximately 6 months before the thesis defense. The Committee Chair and the Thesis advisor must attend this meeting. A week prior to this meeting, the student must submit an outline of the thesis (indicating sections that have been completed and any experiments that have not yet been completed), and a finished version of the introductory chapter to the Thesis committee.
The student should also submit a draft of the first, introductory chapter of their Thesis. The student must also present any evidence of having published significant findings of their primary thesis research, as a first author, in peer-reviewed journals. Furthermore, drafts of any papers that are being reviewed for publication or about to be submitted must be presented to the committee. A letter must also be provided to the committee by the student’s advisor that evaluates the student’s progress towards the Ph.D. and readiness to defend. This meeting provides an opportunity for the Committee to evaluate the student's progress, suggest any additional experiments that may be necessary before completion of the thesis, and determine whether the expected time-frame for completion of the thesis is reasonable. Each student who is within a year of graduating is responsible for scheduling the pre-defense meeting with the Thesis Committee. The graduate secretary should be informed of the pre-defense meeting date. The final defense cannot be scheduled until the student has the approval of the Thesis Committee and their Advisor.

**Thesis defense**
The Ph.D. candidate is expected to arrange an acceptable date and time of the thesis defense with the Final Thesis Defense Committee and submit the thesis to committee members **at least 2 weeks prior to the final examination.**

The format of the thesis must first be approved by the graduate secretary and subsequently approved by the Graduate College. The Graduate College has strict requirements for the thesis format. A copy of these thesis guidelines can be obtained from the Graduate College Web Site [http://www.grad.illinois.edu/thesis/thesishandbook/chapter111.asp#section01](http://www.grad.illinois.edu/thesis/thesishandbook/chapter111.asp#section01) or from the Thesis Office. Students must read these thesis guidelines carefully before writing the thesis. A time lag of up to but not exceeding one year is permitted between time of the final exam and official depositing of thesis in the Graduate College. The degree is not official or conferred until the thesis is deposited.

The Thesis Committee will read the thesis and make suggestions for corrections that may be necessary to complete the Ph.D. **no later than 1 week prior to the defense date.** The student must complete the necessary changes before the thesis defense date. If it is determined by the committee that the required changes are so extensive that this timeline cannot be met, or if the changes could be made but the student fails to meet this one-week deadline, the Thesis Defense Committee may refuse to meet at the prearranged date.

The Ph. D. Candidate should reserve a room for the thesis defense, and inform the graduate secretary of the time and place of the meeting **at least 4 weeks in advance to receive approval from the Graduate College.** The graduate secretary will prepare a seminar notice of the thesis defense. The thesis defense is a public seminar where the student presents the research project and answers questions about the research. After the seminar the student meets with the Thesis Defense Committee to answer any remaining questions and discuss any changes required in the thesis. After successful completion of the thesis defense, the committee will sign a “Final Exam Result (FER)” form and it will be forwarded to the Graduate Student Academic Services office the same day. The Committee will sign three forms of the Thesis/Dissertation Approval (TDA) form.
In addition, **one completed and final, corrected copy** (color if used) of the final thesis must be submitted to the CDB office once the graduate college has approved and accepted the thesis.

### 2. Additional Requirements, Opportunities and Expectations

**M.D./Ph.D. Students**
All MSP students begin their studies in full-time graduate course work and/or research. Exceptions are granted for students already enrolled in medical studies and may be granted for students already enrolled in graduate study in the department in which they intend to do their PhD at the time of admission to the MSP. Students are encouraged to take M1 classes while completing their graduate program requirements. Students are expected to complete the Ph.D. requirements prior to initiating the second year (M2) of the medical curriculum. Exceptions to this policy require explicit permission from the graduate thesis advisor and the MSP Director. The graduate advisor might also wish to consult with the student’s thesis committee.

M.D./Ph.D. students granted exceptions to policy 2 above must progress to Stage III of their graduate program prior to participating in more than one clerkship rotation in the medical curriculum.

As per COM policy, MSP students must pass all M-1 courses taken during each academic year including summer makeup examinations(s). Students must repeat all M-1 courses taken to date if students fail any component of the M-1 curriculum.

**Teaching**

Becoming a proficient teacher is an important part of graduate education. The department requires each graduate student to teach the equivalent of 50% for one semester. Every prospective teaching assistant must attend the All-Campus Teaching Assistants Orientation prior to becoming a teaching assistant.

Illinois state law requires that all instructors at the University of Illinois be orally proficient in English to be eligible to teach. Graduate students for whom English is not their native language must achieve a score of 5 or higher on the English Proficiency Interview (EPI). In addition, campus policy requires those who pass the EPI to attend both the Graduate Academy for College Teaching as well as the Graduate Symposium on Grading & Office Hours.

**Experimental Records and Data**

All experimental procedures and results should be carefully recorded in the student's lab notebooks. Laboratory notebooks should be systematic and thorough enough to be scrutinized by other scientists or granting agencies. University policy states that all laboratory notes and data are property of the laboratory where the research was done and should remain in the laboratory when the student leaves. With permission of the research advisor, the student may take a copy of these materials upon leaving the lab.
Publication
Prior to graduation, all CDB Ph.D. graduate students are required to publish significant findings of their primary thesis research, as a first author, in peer-reviewed journals.

Ethical Conduct
Students and faculty are expected to hold the highest ethical standards during their pursuit of scholarly research and teaching. Students should become familiar with the definition of academic misconduct (see Code of Campus Affairs, A Handbook of Graduate Students and Affairs, Responsible Conduct Guidelines, the University of Illinois Policy and Procedures on Academic Integrity in Research and Publication). All students are expected to adhere to the standards of intellectual and academic integrity as spelled out in these publications. Each student must complete MCB 580, Research Ethics & Responsibilities.

Any member of the University community who becomes aware of an apparent instance of academic misconduct relating to research or scholarship is obligated to report the incident or practice to the Department Head (or to the Campus Research Standards Officer). The Department Head and the Campus Research Standards Officer are charged with protecting the academic reputation and position of anyone who in good faith reports misconduct in scholarship or research.

Grievances
Students and faculty at the University of Illinois are a diverse group whose personalities, experiences, activities, and personal goals vary widely. Most conflicts and problems that arise in this environment can be resolved without invoking formal grievance procedures. Informal resolution is best for all concerned. At times, however, formal grievance procedures are necessary. Informal and formal means by which graduate students may pursue resolution of their grievances are explained in the FAQ section of this handbook. Specific policies and procedures for filing a formal grievance in a document titled “Graduate College Policy and Procedures on Grievances by Graduate Students” can be found on the Graduate College’s website (http://www.grad.illinois.edu/gradhandbook/chapterix/section04).

Frequently Asked Questions (FAQs)

1. What should I do if I do not find a permanent laboratory by the end of my first semester in MCB?

   Occasionally a first year MCB student will not find a permanent research laboratory by December. Typically the MCB Graduate Program Committee will know of your situation and we will work with you to find a laboratory willing to take you for a 4th rotation as soon as possible. In order to expedite this process, you should make a list of additional faculty who are working in your area of interest and make an appointment with the MCB Graduate Program Committee
Chair to go over your options. Unless other arrangements are made, your 4th rotation should begin immediately after your fall semester final examinations and it should be completed by the beginning of the spring semester.

2. What are my resources for funding?

Typically CDB students are funded by the research assistantships (RA) provided by your research laboratory, Teaching Assistantships, or various fellowships offered by the University or outside sources. During the semesters you teach, you are paid as a teaching assistant (TA). It is the role of your research advisor to keep in touch with you and discuss your funding status. There may be an occasion when you will need to seek alternative funding in place of the RA typically provided by your advisor. If you need a TA during the upcoming semester, you and your advisor should contact the Associate Head of the Department and let that person know that you will require a TA during a particular semester.

During each semester the department nominates 2-3 students for Graduate College travel awards. For details and qualifications see the section on travel awards on the Graduate College Web site.

http://www.grad.uiuc.edu/Policies/travelgrant/app.pdf

3. What is mentorship and what can I expect from my advisor?

What if the advice that my advisor gives me is different from the advice of the CDB Department program?

It is the responsibility of your advisor to provide advice that will facilitate your progress through the CDB curriculum and to understand the Program requirement and goals. Your advisor is required by the Department to be supportive of your efforts to hold your Preliminary Exam on time, to write the required documents in the appropriate format, and to turn them in on or before the due dates. If you have questions or concerns, please feel free to contact the Chair of the CDB Graduate Committee.

What if my advisor asks me to change my research project completely?

Occasionally it is in your best interest to redefine your research project. Ideally, you should have a good working relationship with your advisor and you resolve this issue together. If you need advice on how to establish improved communication with your advisor, you may meet with the Chair of the CDB Graduate Program Committee.
What if I need to change advisors or programs?

Occasionally, a student may feel that his/her intellectual or career development would be served best by changing advisors. Reasons for this decision might include a change in research interests by the student, differences between the scientific philosophies of the student and advisor, or personality conflicts. For various reasons the advisor may leave the University or could lose research funding. Either the student or the advisor might desire that a change be made. It is departmental policy that students should be able to change advisors when such circumstances warrant. At the same time, the decision to change advisors should not be taken lightly, since the advisor may have committed a position in the laboratory, rejecting other potential students in the process, and may have provided financial support during the early training period in expectation of increased productivity later. From the student's perspective, it is likely that a change in advisors will increase the time to completion of the Ph.D. degree and reduce the recognition he/she would receive for any work already completed. Because of these consequences, the student and advisor should attempt to resolve any conflicts or adjust the program of the student to better fit their career objectives before making the decision to change advisors.

In the event that a student-advisor relationship breaks down, the student or the research advisor should consult the Department Head prior to switching of the research advisor. A written agreement may be necessary in cases that have implications for publications, ethical conduct, or grievances.

4. Choosing your Thesis Committee

What if I need to substitute a member of my thesis committee?

If you need to substitute a member of your thesis committee, you need to confirm that the new prospective member has at least the same status as the one who is leaving, i.e. tenure-track faculty in CDB or not in CDB. The new member will have to be approved by the CDB Graduate Program Committee and the Graduate College.

What if I would like to have a non-tenured professor on my thesis committee?

If the scientist that you would like to have on your committee is not tenured or on a tenure-track appointment, you need to write a
note to the Graduate College via the CDB departmental secretary and explain why this prospective member will be an asset to your committee. One successful explanation is to say that Professor (X) is one of a very few experts in the field of (___) on this campus and he or she will provide extremely valuable advice on your dissertation research progress. You should be as specific as you can in relating the prospective committee member’s credentials to your research project.

5. Writing your Preliminary Examination Document

What if my advisor or a member of my thesis committee is not reading my written document or my preliminary examination document and providing feedback in a timely fashion?

When you deliver your paper to the faculty member, you might say that you will come back in a couple of weeks for feedback. The faculty members should have edited the paper by then. It is not necessary to sit with the student and go over the paper again.

6. Your Preliminary Examination

What if I do not get enough feedback from my Preliminary Examination?

You should get a letter from your thesis committee chair that comments on the 5 topics listed on the green CDB Prelim Exam feedback form.

7. What if I have an exceptional circumstance and I cannot take my Preliminary Examination during the second semester of my second year?

If a student has unusual and compelling circumstances (e.g., switching of research advisor or serious illness) during the first two years of graduate study that prevents him/her from taking the Preliminary Examination by the end of the second year, the student may request an extension in a letter to the Chair of the CDB Graduate Program Committee, before March 1st of the third year. Also the student must ask his/her advisor to submit a letter to support the petition. If the extension is granted, the student must take the Preliminary Examination during the following September CDB examination period. In the event an extension is denied, the student will take the Preliminary Examination as previously scheduled.

8. How do I know when I'm finished with my Ph.D. research?

Typically the student and advisor come to an agreement regarding the extent of the project when the student is writing the Preliminary
Examination. The Thesis Committee will initially endorse feasibility and initial timeline of the project. The annual student reviews will provide a guide for student, advisor, and the thesis committee in accessing student progress. Students should publish their findings as they complete appropriate portions of their research. This will provide milestones for the student and advisor and provide the framework for your thesis chapters. If the student and advisor cannot agree that the student has completed the entire dissertation research project, the student should seek counsel from the Thesis Committee.

9. What if I have a grievance?

**Informal Resolution** — a student who believes he/she has a legitimate grievance (i.e., discrimination, sexual harassment, capricious grading) should first discuss the problem with his or her advisor. If discussion with the advisor is inappropriate or unsatisfactory, the Chair of the Graduate Program Committee or the Department Head should be consulted. The campus Ombuds Officer is also available for consultation and assistance and can direct students to others who can help.

**Formal Resolution** — where informal procedures are ineffective, a student may initiate a formal grievance. To do this a student should write a statement to the Department Head and the Chair of the CDB Graduate Program Committee. An appointment will be made and these two officers will meet with the student to discuss the case and recommend a course of action. A student, dissatisfied with the department level result may, after consultation with a Graduate College Dean, appeal that decision to the Graduate College Grievance Committee.

10. What if I have additional questions or suggestions for new FAQ’s?

Please contact the CDB Secretary or any member of the CDB Graduate Program Committee!