

ACADEMIC GUIDELINES FOR PMCB

The following pages outline **Guidelines** governing all students who enter the Program in Molecular and Cellular Biosciences (PMCB) and comply with the guidelines and requirements in the **By-Laws of the Graduate Council, By-Laws of PMCB** and the **Regulations and Guidelines for Thesis Preparation and Defense**. Students are additionally subject to important guidelines contained in the **OHSU Graduate Studies Handbook**.

The PMCB program follows a general time line:

Year 1: PMCB conjoint course requirements:

Complete CON 661-664[#] + 665, 667, 668*, 669*

Complete three laboratory rotations (see below).

Present one rotation talk or poster based on a rotation

Attend departmental seminars for rotation laboratory.

Attend all PMCB seminars and participate in associated journal club and lunch.

Prepare for and pass Comprehensive Exam.

Choose thesis advisor and select Departmental Program for completion of Ph.D.

Year 2: Complete PMCB conjoint course requirements (complete 2 of 665,667,668*)

Complete required and elective courses for the selected department.

Attend all PMCB seminars

Prepare for and pass Qualifying Exam.

REQUIRED PMCB CONJOINT GRADUATE CLASSES FOR YEAR ONE

Fall Term

CON 605D	PMCB Literature Club	2 credits
CON 661 ¹	Structure & Function of Biological Molecules	3 credits
CON 662 ¹	Genetic Mechanisms	3 credits
CON 650	Practice & Ethics of Science	2 credits
CON 601	Research Rotation	6 credits
Fall Term Credit Total		16 credits

Winter Term

CON 605D	PMCB Literature Club	2 credits
CON 663 ¹	Bioregulation	3 credits
CON 664 ¹	Molecular & Cell Biology	3 credits
CON 601	Research Rotation	8 credits
Winter Term Credit Total		16 credits

Spring Term

DEPT 606 ²	Departmental Journal Club	2 credits
CON 665 ³	Development, Differentiation and Cancer	3 credits
CON 667 ^{3,4}	Organ Systems	3 credits
CON 668 ³	Molecular Biophysics & Experimental Bioinformatics	3 credits
CON 669 ³	Principles of Chemical Biology	3 credits
CON 601	Research Rotation	8 credits
Spring Term Credit Total		16 credits

Summer Term

CON 608A	PMCB Comprehensive Exam	8 credits
CON 601	Research Rotation	8 credits
Summer Term Credit Total		16 credits

REQUIRED PMCB GRADUATE CLASSES FOR YEAR TWO

Fall, winter and spring term

Courses, seminars and research requirements in the second year of study vary depending on the program the student selects for completion of their Ph.D. Details for the individual programs for the second and subsequent years follow the description of the PMCB requirements. A total of 16 credits will be taken each quarter.

Summer term

CON 608B	PMCB Qualifying Exam	8 credits
CON 601	Research Rotation	8 credits
Summer Term Credit Total		16 credits

NOTES TO ALL COURSE REQUIREMENTS

1. Students may test out of CON 661-664. One week before fall term, any PMCB student may request permission from the PMCB director and relevant CON directors to take all of the previous year's exams in one of the CON courses. Student must receive a score of 80% or better on the entire exam to place out of the course. This option is available once a year only in the week prior to fall term. Students must still register for the required number of credits.
2. Student chooses a journal club offered by one of the five Basic Science Departments (appendix A).
3. Students select two of: CON 665, 667, 668, 669 and have until the end 2nd year to complete.
4. For MD/PhD students only: MSCI 613, Systems Processes and Homeostasis will be accepted instead of CON667 Organ Systems.
5. The School of Medicine requires students to **maintain a grade point average of 3.0**. A student receiving a cumulative GPA below 3.0 is automatically put on academic probation. The grade of **Incomplete** is reserved for circumstances beyond control of the student (i.e. illness) preventing completion of course requirements by the end of term AND where it is possible to complete requirements within one subsequent term.
6. Students **failing a semester of research** credits (i.e. receives a NP-No Pass) are immediately placed on academic probation. To return to good standing, the student must obtain a passing grade on the next term of the Research (and all subsequent terms). Failure to do so constitutes grounds for termination from the program.

PMCB STUDENT ADVISORY COMMITTEE (PAC)

Initial advice will be provided by members of the PMCB Advisory Committee (PAC) made up of PMCB faculty knowledgeable in all aspect of graduate training in the School of Medicine at OHSU. PAC advising and mentoring provides consultation for PMCB student regarding academic and non-academic concerns. At the time of matriculation, each student is assigned a PAC advisor. PAC advisors are familiar with academic requirements of all five participating graduate programs, as well as the Graduate Council By-Laws, Student Handbook and general School of Medicine regulations.

PAC Advisors:

1. Meet with the student at least once each term
2. Review and advise regarding rotation decisions, course choice and registration
3. Review the student's academic record and written rotation performance summary at the end of each term.

4. Promptly meet with student placed on academic probation to formulate a plan for amelioration
5. Report any concerns to the Chair of the PAC and/or the PMCB advisor.

Advising responsibilities transfer from PAC advisor to thesis advisor once student has passed the 2nd year qualifying examination and advanced to Candidacy. At that time, student will form a thesis advisory committee according to guidelines of the graduate program (department) selected.

FIRST YEAR ROTATIONS

All students undertake research rotations in three different laboratories during their first nine months of the graduate program although it is possible (and recommended) that students begin their first rotation in the summer preceding the first year. Students are expected to spend approximately 20 hours a week in each lab engaged in lab activities to familiarize themselves with research projects and the laboratory environments of PMCB faculty. The secondary purpose of rotations is to learn new techniques and experimental approaches and to ultimately select a thesis advisor. Each student and faculty rotation mentor will complete a written evaluation of the rotation that will be shared with student advisors and kept by the PMCB Coordinator. In consultation with rotation mentors, students are strongly encouraged to establish expectations prior to each rotation. Students are required to prepare one 15 minute oral presentation describing a research rotation as part of the PMCB Research Rotation Colloquium

After successful completion of three research rotations, students select a faculty member to serve as their Thesis Mentor. The decision of a student to enter into a laboratory to pursue thesis research is dependent upon a joint agreement between the faculty member and the graduate student. The Thesis Mentors must be a member of both School of Medicine Graduate Faculty and PMCB faculty.

PMCB WRITTEN COMPREHENSIVE EXAM (end of year 1)

Overview: All first year PMCB students are required to take the written comprehensive examination at the scheduled time following completion of their first year of graduate studies. This examination tests student's ability to think scientifically using concepts covered during the first year of coursework. The comprehensive exam is prepared by the PMCB Comprehensive Exam Directors.

The exam is divided into three parts.

(1) A review of the scientific literature. The first part is completed over a weekend and gauges the student's ability to read and interpret scientific literature. Students are tested on their ability to interpret the data, explain methodologies, identify strengths and weaknesses, and integrate results into larger fields of molecular and cell biology.

The second and third parts are administered in-class on the following Monday and consists of

(2) An integrative question that tests the ability to apply core principles learned in the CON courses; and (3) questions designed to assess the breadth of knowledge within the disciplines represented within each CON course. Exam questions will consist of several components and be designed to test broad as well as specific aspects of student's knowledge. Effort will be made to integrate key concepts across traditional discipline boundaries. Answers will be evaluated for breadth and depth of knowledge. *Students with a GPA of 3.5 or greater and in good academic standing may opt out of Parts two and three of this exam in which case their Cumulative Exam grade will be based solely upon Part One, the review of scientific literature.*

PMCB Comprehensive Exam Directors: Two faculty members will be director and co-director of the Comprehensive Exam, these are rotating positions lasting 2 years, one new faculty member cycles on as co-director each year. Directors will assemble the comprehensive exam, administer it, assess and report test scores to students and to the PAC committee and will make recommendations to the PMCB steering committee regarding passing, remediation or dismissing PMCB student.

Examination format: The PMCB Comprehensive Exam Directors will set the dates of the exam, which will typically be four weeks following the completion of spring quarter. The exam will consist of three parts. One based upon assessing literature, and the second and third will be answering essay questions covering material covered in CON 661-664 designed to test broad as well as specific aspects of student's knowledge. Effort will be made to integrate key concepts across traditional discipline boundaries. Answers will be evaluated for breadth and depth of knowledge.

The Directors will request questions from instructors in the CON courses. Questions will be submitted within two weeks following completion of each CON course. Final assembly of the exam is the responsibility of the PMCB Comprehensive Exam Directors.

Part One: On Friday, at least two weeks before the written exam, students will be given four research articles that are thematically related and equally distributed among CON course themes. Students may read and discuss these papers with others. On Friday, at the end of the two-week period, students will receive multi-part exam questions for each of the 4 articles. Students must answer these questions independently, but may use all resources (except people) to answer these exam questions. Answers will be turned in the following Monday at the start of the second part of the exam.

Part Two: The second part of the exam will be four integrative essay questions that are thematically related and equally distributed among the CON courses. These questions will be developed by the Directors of the CON course and the intent will be for students to apply core principles learned in each CON course to develop the answer. Students will be given these questions at least two weeks before the written exam (at the same time they are given the research articles) and must work independently, using all resources (except people) to prepare their answers. On the Monday following assignment of the research article questions, students will be expected to answer these questions as part of an in-class closed book exam (approximately 30 minutes per question).

Part Three: The third part of the exam will be administered simultaneously with the closed book exam in part two. This in-class exam will consist of a series of short answer questions per CON course and students will be allowed to choose a subset of these to answer within each CON course. The number of short answer questions submitted and the number of questions to be answered may vary between CON courses and will be determined by the CON course directors and approved by the Exam directors. This exam will be closed book format and will be divided into two three hour sessions. There is a break between the two sessions. During the first session, students will answer exam questions from CON 661 and 662. During the second session, students will answer questions from CON 663 and 664 (approximately 60 minutes per CON course section).

Grading: The primary grading of exam questions will be done by participating faculty members and reviewed as necessary by Exam Committee Directors. Results of the comprehensive written exam will become part of the student's permanent record, shared with the PAC committee and with student's thesis mentor.

Outcomes: The Comprehensive Exam Directors will analyze exam scores and assign a final grade of **Pass** or **Fail**. A passing grade is awarded to students who successfully pass all three sections of the exam. Students who receive a passing grade will advance to their second year of studies.

Students who did not pass one or more sections of the exam will be discussed on an individual basis by the Exam Directors, in consultation with the PMCB Advisory Committee and PMCB Director. Those on academic probation before taking the exam, who fail the exam, will be subject to dismissal from the PMCB. Those students who fail the exam, but with otherwise good academic records, will be required to remediate their deficiencies. This will involve assigned reading, writing a paper that covers areas of weakness and demonstrating in discussions with faculty that the student has mastered these areas. All remediation must be completed by the end of the winter quarter, at which time the Comprehensive

Exam Directors will determine whether the student has successfully learned the material. Any student who has not demonstrated mastery of the material at this time will be recommended for dismissal. Comprehensive Exam Directors will report outcomes of the exam to the PMCB Steering Committee.

PMCB QUALIFYING EXAMINATION: (end of year 2)

Eligibility: To be eligible to take the PMCB Qualifying examination, students must have successfully completed all coursework required in the first two years of the PMCB curriculum, and they must have received a passing grade in the PMCB Comprehensive Examination. In addition, students must be approved by the PMCB advisory committee to advance to the Qualifying Examination.

- **Committee Definitions:** Detailed descriptions of each committee and their responsibilities are summarized at the end of this document.
- **PMCB Qualifying Examination Committee:** the PMCB committee responsible for oversight of the Qualifying Examination Process for all PMCB students.
- **Examination Panel:** the committee responsible for administering a specific qualifying examination. This committee will consist of five PMCB faculty appointed by the Departmental Examination subcommittee.

FORMAT AND TIMELINE FOR THE QUALIFYING EXAMINATION

Overview: The Qualifying Examination consists of written and oral components. The candidate must pass both the written and oral portions of the examination in order to pass the qualifying examination. The written component will resemble a NIH-style NRSA grant proposal on any topic chosen by the student, including the student's proposed thesis research.

The oral component will commence with a 20-30 minute presentation by the student on the topic of the written proposal. Members of the Examination Panel will ask the student a series of questions on the proposal and related scientific areas (see detailed guidelines below).

Timeline and description: The following dates are the final deadlines for the stages of the qualifying examination; earlier completion is encouraged. If a scheduled date falls on a weekend, the actual due date will be on the following Monday. **Further extension of these deadlines for any reason will be considered only by petition to the PMCB Qualifying Examination committee.**

- **July 14: Students must submit a 2 page prospectus** that defines the topic for their Qualifying Examination, describes potential questions to be addressed, and outlines an experimental plan on their topic to the Departmental Examination Subcommittee. Students may also suggest names of three faculty members that could be part of the Examination Panel (although there is no obligation on the part of the subcommittee to choose these faculty for the examination committee).
Departmental Exam Committee has one week to identify any weaknesses in the plan and/or specific aims and notify the student.
- **July 31:** Deadline for the Departmental Examination Subcommittee to appoint the **Examination Panel** responsible for conducting the student's Qualifying Examination.
- **August 7:** Deadline for the student to schedule a date for his/her oral examination, in consultation with his/her Examination Panel.
- **August 21: Deadline for submission of the final written Proposal to the Examination Panel,** along with a letter from the thesis advisor, describing the roles of advisor and student in preparation of the proposal (see below).
- **Deadline to complete Qualifying Examination:** Examinations must be completed before the beginning of Orientation week for the Fall term.

Format of Written Proposal: The proposal should be written following current general guidelines of an NRSA application. It should consist of a hypothesis-driven series of experiments bearing directly on the question or hypothesis of the proposal, with a discussion of probable outcomes, interpretations and alternative approaches. The proposal should be no longer than 10 pages (single-spaced), excluding figures and references.

Students may discuss topics and proposed experiments with all sources (fellow students, post-doctoral fellows, faculty, and visiting scientists), but none of them may be involved in any aspect of the student's written proposal. Students may also seek general assistance in scientific writing and proofreading. However, it must be remembered that the written proposal is an examination, and must represent the student's ideas and development of the research topic. Students are expected to adhere to established guidelines for professional ethical conduct in the preparation of their Qualifying Examination proposal topics.

Role of Thesis Advisor and Other Faculty: To facilitate an objective examination, the mentor is not permitted to edit or comment upon the student's written proposal. Neither is the mentor, nor any other faculty member, permitted to coach the student in a rehearsal of their oral presentation.

The student must attach a signed letter from their thesis advisor describing in specific detail the role of the advisor and of the student in the development of the hypothesis and research plan in this proposal. The thesis advisor must confirm that they have NOT contributed to the written portion of the exam, and that the student has NOT used any of the advisors prose within the proposal. This letter will be shared with the all members of the examination committee, who have two weeks from receipt of the proposal and letter in which to request more information from the advisor if deemed necessary.

Format of Oral Examination – The oral examination will probe the breadth of student's knowledge and also the depth of the student's understanding of his/her research proposal. Students are expected to begin the oral examination by giving a short formal presentation that provides a summary of the written proposal (20 - 30 min), and may use audiovisual aids. The student's presentation should not be interrupted by questions from the Examination Panel. Subsequently, members of the Examination Panel will ask the student a series of questions. The use of prepared visual aids, textbooks, or other reference material is NOT permitted during this portion of the oral examination, although the student may be asked to refer to figures contained within the proposal.

Questions from the Examination Panel should focus primarily on issues pertaining to the proposal; however, the student is responsible for all areas of cellular and molecular biology that have been covered during the first two years of graduate study. Therefore, students also should expect questions on general knowledge in addition to questions relating to the scientific background pertinent to their areas of specialization, as well as more general issues related to the proposed experiments. Students may be asked about the choice of methodologies, their relative advantages and disadvantages, and potential alternative strategies (when appropriate). Students will be expected to understand and be ready to explain the scientific basis of technical methods they intend to employ. The student should be prepared to discuss the rationale for the proposed study, the strengths and limitations of the proposed experimental strategies, and potential pitfalls and alternatives.

Preparation for the Oral Examination Students should be thoroughly familiar with key historical and background publications that provide the foundation for their proposal, as well as any current literature that directly pertains to their specific aims. In addition, students are encouraged to review the more general areas of cellular and molecular biology that provide the conceptual framework for their proposal. Once a student has submitted their final proposal to their Examination Panel, he/she may contact members of the Examination Panel if they wish additional guidance with respect to their preparation for the Qualifying Examination.

Outcomes

The outcome will be decided by majority vote of the Examination Panel. The outcome should be recorded on the PMCB Qualifying Examination form. The form should be signed by all voting members of the examination panel and returned promptly to PMCB, L474. Students will be informed of the outcome immediately following the oral examination. Possible outcomes include the following:

Pass –The student passes both the written and oral examination. In certain circumstances, the Examination Panel may identify specific areas of weakness that the student needs to address during subsequent thesis work. This information will be communicated in writing to the student, mentor and PMCB by the chair of the Examination Panel.

Conditional Pass – A conditional pass may be given for either the written or oral components of the examination if significant deficits are identified. In this event, the student will be provided with specific requirements that must be met by the student within a prescribed time frame. A variety of requirements may be assigned at the discretion of the Examination Panel to correct a perceived deficit, including (but not limited to) additional coursework; revision of some or all of the written proposal; assignment of additional directed reading; preparation of a written review of a particular topic; or presentations in journal club formats. In the case of assigned additional coursework, the student must complete the assigned course(s) with a grade of B or better. The chair of the Examination Panel will prepare a written memo to the student describing the conditions required to remove the conditional pass within one week of the examination and will submit a copy of the memo to the PMCB, L474.

The chair of the Examination Panel will be responsible for notifying the student, the student's advisor, and PMCB (L474) when the student has successfully completed the requirements of the Conditional Pass. Failure on the part of the student to complete the requirements of the Conditional Pass within the prescribed time frame will be considered as unsatisfactory progress, and the student will be subject to dismissal from the PMCB.

Fail – A student must pass both the written and oral components of the Qualifying Examination. If the student fails either portion of examination, the student will fail the Qualifying Examination. Within one week of the examination, the chair of the Examination Panel will provide a written memo to the student, the advisor and the PMCB, L474, describing the deficiencies that led to failing the qualifying examination.

The student may petition the Departmental Examination Subcommittee to take the entire qualifying examination (written and oral) again within the subsequent three months, or alternatively may resign from the graduate program. The Examination Panel may also elect to offer the student the option to complete a Master's Degree, rather than re-taking the Qualifying Examination; in such a case, students will be obligated to complete all the requirements for the Master's Degree of their home department. The Examination Panel will counsel the students with respect to the most prudent course of action. If the student decides to re-take the Qualifying Examination, then he/she must submit a revised or new proposal to the Departmental Examination Subcommittee, as summarized above; and will have five weeks to complete the full proposal.

Timeline for re-examination: The re-examination procedure must be completed within three months of the original examination, but no later than the end of Fall term of that year.

Outcome for re-examination: Students will be assigned a "pass", "conditional pass", or "fail" by the same criteria as summarized above. Failure to pass the Qualifying Examination after two attempts will automatically result in dismissal from the graduate program.

Committees involved in the administration of PMCB Qualifying Examinations:

The PMCB Qualifying Examination Committee: Each participating department shall appoint one representative to serve on the **PMCB Qualifying Examination Committee**; usually this representative will be the chair of the **Departmental Examination Subcommittee** (see description below) that is in charge of administering the Qualifying Examinations for all students intending to complete their Ph.D. degrees in that department. This committee shall be responsible for oversight and review of the Qualifying Examination process in all participating departments and shall also be responsible for resolving conflicts that cannot otherwise be solved at the level of the Departmental Subcommittees. The PMCB Qualifying Examination Committee may appoint a PMCB faculty member to attend a Qualifying Examination.

The Departmental Examination Subcommittees: Each Department within PMCB shall establish a **Departmental Examination Subcommittee** that will supervise the administration of all Qualifying Examinations for students who intend to complete their Ph.D. degrees in that department. The Departmental Examination Subcommittee is to consist of five PMCB faculty members, three of whom may have primary appointments in the department, while the others are to have primary appointments outside of the department. PMCB faculty member with joint or adjunct appointments with a department may serve as outside members of the Departmental Examination Subcommittee.

The Examination Panel: For each examination, the Departmental Examination Subcommittee will appoint an Examination Panel of five faculty members and assign one of panel member to serve as chair. The Examination Panel should usually include at least one member of the Departmental Examination Subcommittee. The Examination Panel is to consist of five PMCB faculty members, three of whom may have primary appointments in the department, while the others are to have primary appointments outside of the department. PMCB faculty member with joint or adjunct appointments with a department may serve as outside members of the Examination Panel. Each of the 5 members of the Examination Panel will participate in the examination process and vote on the outcome. In addition, a non-voting member representing the PMCB may attend all deliberations and meetings of each Qualifying Examination Committee. The student's advisor/mentor may not be appointed to the Examination Panel. The advisor/mentor may attend the qualifying examination as a nonvoting, silent observer. The advisor/mentor may not attend sessions of the examination when the panel privately discusses the student's performance, except at the invitation of the panel. The Examination Panel will be responsible for evaluating the written and oral components of the Qualifying Examination, for determining the outcome of the examination, and for identifying any requirements that a student must complete in the case of a Conditional Pass (subject to approval by the PMCB Qualifying Examination Committee).

Advancement to Candidacy Upon successful completion of the qualifying examination, students will become eligible for recommendation for advancement to candidacy. The PMCB Director will sign the PMCB Qualifying Examination form indicating successful completion of all PMCB requirements and forward the form to the relevant department. The department chair or graduate program director will have responsibility for recommending students for advancement to Ph.D. candidacy when all of the department's academic requirements have been fulfilled.

BIOCHEMISTRY AND MOLECULAR BIOLOGY GUIDELINES AND EXPECTATIONS FOR Ph.D. STUDENTS (Years 2+)

These rules pertain to all students in the Department of Biochemistry and Molecular Biology (BMB) and are in partnership with the guidelines and requirements set forth by the Program in Molecular and Cellular Biosciences (PMCB) and the Graduate Council of the Oregon Health & Sciences University (OHSU) School of Medicine.

The Ph.D. program is organized as follows:

Year 1: Complete PMCB requirements

Year 2 Complete the PMCB Qualifying Examination
Undertake the research leading to the Ph.D. thesis
Complete required and elective courses
Attend and participate in Departmental seminars and a journal club

Years 3 + Create a Research Advisory Committee (RAC) Continue research leading to the Ph.D. thesis Attend and participate in Departmental Seminars and a journal club of choice closest to thesis work

REQUIRED BMB GRADUATE COURSES YEAR 2

Fall/Winter/Spring Term

BCMB 605	Journal Club	1 credit
BCMB XXX	Elective credits	2-4 credits
BCMB 607	Departmental Seminar Series	1 credit
CON 665, 667, & 668		3 credits

Two of these courses must be taken in Year 2 if it was not selected during Year 1 as part of the PMCB required courses.

BCMB 601	Research	14 credits
Term Credit Totals		16-19 credits

Summer Terms through Completion

BCMB 601	Research	16 credits
----------	----------	------------

BMB SPECIFIC COURSE REQUIREMENTS

Students are required to register for, attend and present their thesis work annually in the Departmental Seminar Series, BCMB 607, held Tuesdays at NOON and Thursdays at 4 PM (Years 2 through end of program).

If a student wishes to be excused from taking a required course, the student and advisor should jointly petition the Graduate Curriculum Committee stating their reasons for wishing to be excused from the requirement. The curriculum Committee will decide the issue by a majority vote.

Only course work (required and elective), and not research, journal club or seminar credits, will contribute to the GPA. Students must receive a grade of A or B in the required courses specified in this document. If a student does not receive an A or B, the student must repeat the course the following year. The course can be repeated one time only. Failure to receive an A or B the second time will result in dismissal from the program. The required courses for which this rule applies are CON 650, 661, 662, 663, 664, 665, and 667.

The grade of Incomplete is reserved for circumstances in which a student is unable to complete the course requirements by the end of the term in which the course is offered due to circumstances beyond their control (i.e. illness) AND it is possible to fulfill the remaining requirements within the subsequent term to earn a grade.

If a graduate student fails a semester of research credits (i.e. receives an NP-No Pass on research), the student is put on immediate academic probation. The student is required to obtain a passing grade on the next term (and subsequent terms) of research credits of the student may be dismissed from the BMB graduate program.

Pre-qualifying Graduate Students: A pre-qualifying graduate student is required to notify and meet with his/her mentor, graduate program director (GDP) and graduate program coordinator (GDC) immediately upon receiving a failing grade on the research credits in any one term. The GDP will suggest a course of action that the student must follow in correcting his/her academic performance.

Post-Qualifying Graduate Students: A post-qualifying graduate student (in consultation with his/her mentor, GDP and GPC) is required to schedule a Research Advisory Committee (RAC) meeting immediately upon receiving a failing grade on his/her research credits in any one term. This RAC meeting must take place within two weeks of receipt of the failing grade on the research credits. The mentor and RAC will suggest a course of action that the student must follow in correcting his/her research programs.

The courses BCMB 605 Journal Club and BCMB 607 Seminar require documentation of attendance in order to be considered for the grade of 'Pass.' Post-qualifying, a student and mentor may petition the Graduate Program Director to substitute another formal journal club. A total of 3 absences each are allowed per term. A graduate student missing more than 3 will receive a failing grade of 'No Pass' and will be placed on immediate academic probation. The student must receive a 'Pass' the subsequent term and every term thereafter.

Following the receipt of the first 'No Pass,' a pre-qualifying exam student must immediately meet with their mentor, GDP and GDC. A plan for insuring the attendance goal for the next term should be designed.

Two grades of 'No Pass' in any one of the two activities disqualifies a student from taking their qualifying exams, resulting in dismissal from the BMB graduate program. Two grades of 'No Pass' in any one of the two activities for a post-qualifying exam student may result in dismissal from the BMB Graduate Program.

Elective Courses: A total of 9 credit hours of elective courses are required to be eligible for the Biochemistry & Molecular Biology Ph.D. degree. Students are strongly encouraged to start taking at least one elective course no later than winter term of their second year.

The following are only a few of the popular electives taken by the graduate students in BMB. Other courses available are listed in the course catalogue and graduate students are encouraged to speak to their mentor and/or GPD when considering taking other courses. Some of the elective courses are offered every other year, relative dates are noted below:

BCMB 620	Biochemical & Biophysical Properties of membranes	2 credits/Winter Term
BCMB 628	Protein Crystallography	2 credits/Winter Term
BCMB 625	Advanced Molecular Biology & Nucleic Acid Biochemistry	3 credits/Spring Term
BCMB 618	Protein Design: How Structure is Related to the Function of Proteins	3 credits/Winter Term

Ph.D. Research Advisory Committee Guidelines

PURPOSE: The purpose of the Research Advisory Committee (RAC) is to advise and oversee the progress of the student's entire graduate education and training. The Committee should be composed of two or more primary faculty members of the Department of Biochemistry and Molecular Biology, and other members with appropriate research expertise, to total four members. The Chairperson of the committee is the Student's Research Advisor (mentor). If the focus of the student's research changes, then appropriate changes in the makeup of the RAC can be made. The RAC should advise the student in matters of curriculum requirements and research objectives. The Committee may assist the student in developing and focusing the specific research objectives, which should ultimately form the main body of the thesis.

Forming the Committee: Immediately after the student has joined a laboratory, a RAC is to be formed. Before the start of fall term, the student should prepare a one-page document which contains a short abstract of immediate research goals and a list of courses that will be taken during the following year. This document will be given to each member of the committee for his/her signature and returned to the office. The RAC will determine whether the required coursework has been taken and may recommend additional coursework pertinent to the specific research goals.

The First Meeting: The first formal meeting must be held by the end of the Fall Term of the student's second year. At least one week prior to the first meeting, the student will be expected to send the Committee Members an updated half-page description of his/her immediate research goals, a copy should also be sent to the Graduate Program Coordinator (GPC) along with a list of the RAC members and the RAC meeting date. The student will give a 5-minute introduction to the research problem. It is the responsibility of the student to schedule this meeting.

Subsequent Meetings: The RAC will meet every 9 months to one year, or more frequently if deemed necessary. The student will update the committee on the progress made toward the research objectives and the completion of required course work. At least one week prior to the meeting, the student will be expected to send the RAC members an updated summary that should be no more than three pages. The meeting will begin with the student giving a 15-minute overview of his/her more recent results and future directions. It is the responsibility of the student to organize and schedule these meetings. Immediately following the meeting, copy of the summary as presented to the RAC should be sent to GPC, and should include information as to the date of the RAC meeting and the members present. Electronic submission to the GPC is acceptable. This will be placed in the student's file.

Final Meeting: Three to four months prior to anticipated thesis defenses the student would have a RAC meeting to obtain approval for the beginning of thesis writing.

Non-compliance: Non-compliance can and will result in the revocation of certain Departmental privileges (e.g. Student's Departmental e-mail account), academic probation and possible dismissal from the graduate program.

BMB Preparation and Submission of Thesis: All instructions and guidelines adopted by the Graduate Council By-Laws shall be carefully followed.

**CELL AND DEVELOPMENTAL BIOLOGY
GUIDELINES AND EXPECTATIONS FOR Ph.D. STUDENTS
(YEARS 2+)**

To complete the requirements for the Ph.D. degree, graduate studies in the Department of Cell and Developmental Biology must successfully complete required and elective courses, attend CDB departmental seminars, perform research and write and defend a thesis. The program requires the completion of at least 135 term-hours of course credit, of which 100 hours must be in either departmental courses or conjoint courses. Generally, students are expected to enroll in 12-16 credit hours per quarter (including summer quarter).

The Ph.D. program is organized as follows:

Year 1: Complete PMCB Requirements

Year 2: Undertake the research leading to the Ph.D. thesis

Complete required and elective courses

Attend and participate in Departmental Seminars and a journal club Years 3+:

Create a research advisory committee

Continue research leading to the Ph.D. thesis

Attend and participate in Departmental Seminars and a journal club of choice closest to thesis work.

Required CDB Graduate Courses - Year 2

*CON 665, 667, 668 3 credits

*Two of these courses must be taken in Year 2 if not selected during year one as part of the PMCB required courses.

Fall/Winter/Spring Term

CELL 605	Journal Club	2 credits
CELL 607A	CDB Departmental Seminar	1 credit
CELL 601	Research	11 credits
Course Totals		16 credits

Required CDB Graduate Courses - Year 3

Summer Terms through Completion

CELL 601 Research 16 credits

CDB Specific Course Requirements:

Credit for previous course work: if a student feels that they have completed an equivalent, graduate-level course to any of the required courses, they may petition to have the course requirement waived. To petition, the student should write a memo to the chair of the CDB tracking committee requesting that the course requirement be waived and explaining why the student feels that the previous course is equivalent to the required course. A course outline or syllabus that indicates the subjects covered by the previous course should be included with that memo.

All students are required to enroll in and attend CELL 607A, CDB Departmental Seminar, throughout their graduate tenure. Students are required to present a Departmental seminar on their thesis work during the second year of graduate studies and at least once more before graduation (usually 3rd or 4th year).

Students are required to enroll in at least two-hours of journal club courses prior to taking their qualifying exam. Possibilities include the Cell Biology Journal Club (Linda Musil, course director), the Developmental Biology Journal Club (Jan Christian, course director) and Signal Transduction Journal Club (Peter Rotwein, course director).

Elective Courses: CDB requires that students complete at least three elective graduate courses offered by CDB or other departments. Below is a listing of some of the more popular electives taken by our students:

CELL 611, Histology – The Structure and Function of Cells in Tissues: Bruce Magun & Karmen Schmidt, course directors. Offered every other year. Introduction to the organization and differentiated function of the major tissues and organs of the body. Students will help develop expertise in the histological identification of tissue and organs under the light microscope. One hour per week will deal with discussion of a paper that uses histological or histochemical analysis in combination with transgenesis or other molecular approaches.

CELL 615, Developmental Neurobiology, Philip Copenhaver, course director. Offered every other year. Topics covered include (i) Patterning of the vertebrate nervous system, (ii) mechanisms of cell determination, (iii) neural cell migration and growth cones, (iv) mechanisms of target recognition and synaptic plasticity, and (v) role of cell death.

CELL 616, Cancer Biology, Bruce Magun and Molly Kulesz-Martin, course directors. Offered every other year. Topics covered include (i) cell cycle, (ii) growth factor signaling pathways, (iii) role of transcription factors in cell cycle control, (iv) DNA damage and repair, and (v) mechanisms of carcinogenesis.

CELL 618, Mechanisms of Development, Jan Christian, course director. Offered every other year. Topics covered include (i) signal transduction and transcriptional regulation of cell fate, (ii) RNA localization and translational control of development, (iii) asymmetric cell division, (iv) embryonic inductions, (v) signaling networks that establish the major body axes, (vi) stem cell plasticity and (vii) organogenesis.

CONJ 654, Signal Transduction, Thomas Soderling, course director. Offered every year. Topics (i) G-protein coupled receptors, (ii) tyrosine kinase receptors, (iii) MAP kinase cascade, and (iv) transcription factors.

Academic progress. The department requires that graduate students maintain an overall 3.0 grade point average in their coursework (A = 4; B = 3; C = 2; D = 1). Courses graded on P/NP basis do not contribute to calculation of the grade point average. If a student's cumulative grade point average drops below 3.0, the student will be placed on academic probation, requiring that he/she bring up his/her grade point average at least a 3.0 within the next 12 months. Please note that academic probation may limit the availability of some kinds of student loans or other financial aid (for further information contact Registrar's office). Any student who fails to achieve a grade point average within the one year time limit will be subject to dismissal from the department.

Students must earn a grade of "B" or better in required courses (defined in Section II). A student who receives a "C" or worse grade for a required course will be placed on academic probation. To remove academic probation due to a poor grade for a required course, the student must achieve a grade of "B" or better for that course within the next 12 months. A student who fails to remove academic probation due to a poor grade in a required course within the one year time limit will be subject to dismissal from the department.

Graduate students must make appropriate progress in research activities. A CDB student receives a grade of not-passed (NP) for a research registration (CELL 503, 601, or 603) will immediately be placed on academic probation. Academic probation status will be removed when a grade of passed (P) is received for a subsequent research registration (CELL 503, 601, or 603) will be subject to dismissal from the department.

Following advancement to candidacy, students must meet with their thesis advisory committee on a regular basis. Students who do not meet with their thesis advisory committee within six months of advancement to candidacy or within 12 months of a previous thesis advisory committee meeting will be placed on academic probation. Students who do not meet with their thesis advisory within one year of advancement to candidacy or within 18 months of a previous thesis advisory committee meeting will be subject to disciplinary action including dismissal.

Ethical and Professional Behavior. CDB graduate students are expected to maintain high ethical standards. Graduate students should demonstrate honesty in all aspects of research activities. Students should learn about and avoid sources of error in scientific research. It is essential that students do not misrepresent scientific findings or misappropriate credit. All graduate students are required to take a course concerning ethics and science. Students should show cooperation, responsibility and respect in working with other students and faculty. Students should be considerate of the cultural and individual diversity or their colleagues.

Students who are involved in unethical or unprofessional conduct such as cheating, misrepresentation of research findings, plagiarism (failure to credit the original author) or disruption of the learning process are subject to disciplinary actions including dismissal from the department.

It should also be noted that students observing unethical behavior by students, faculty or others on campus are obligated to bring these transgressions to the attention of the appropriate person.

Student Salaries/Stipends. For the first PMCB year of graduate studies, the graduate research assistant salary is supported by the PMCB program. At the completion of the PMCB year, students select a department and a faculty mentor to direct their research. When students enter the CDB graduate program and select a faculty mentor, the faculty mentor becomes responsible for financial support of the student's graduate research assistant salary. Eligibility for continuing financial support of salary/stipend is dependent on timely and appropriate progress in course work and research. It should be noted that the Department/School is not responsible for continuing support of student salary/stipends.

Student Tracking Committee. Each CDB graduate student will be assigned to a member of CDB Tracking Committee (i.e., their "tracker") who will be a source of information about courses, other requirements, the qualifying exam, etc. The tracker will monitor the academic progress of their assigned students, particularly before the qualifying examination.

CDB Academic Advisory Committee is formed during the second year of graduate studies and consists of the mentor and three other faculty members. Committee members are selected in consultation with the mentor based on research area and technical expertise. After discussing the committee composition with their mentor, the student should contact potential committee members to determine if they are willing to serve on the committee. The main purpose of this committee is to provide guidance in developing a research plan early in your thesis work. The committee will attend the research seminar presented by the student during the second year of graduate studies. Within one week after presenting the seminar, the student must schedule a meeting with the academic advisory committee to discuss intended future directions. Members of the academic advisory committee often serve on the thesis advisory committee in future years.

Thesis Advisory Committee. Immediately following passing the qualifying exam, students in consultation with their mentor should nominate a Thesis Advisory Committee. This committee consists of the mentor and at least three other faculty members, with at least one committee member from outside of CDB. This committee may include some or all of the members of the student's academic advisory committee. Members of this committee should be chosen based on their research area or technical expertise. The main purpose of this committee is to provide the student with guidance periodically during thesis research. Members of this committee may also serve subsequently on the Thesis Examination Committee. In this way, these faculty members will be familiar with research, and will have the opportunity to communicate possible concerns they may have about your work early to allow time to address these concerns. Committee membership must be approved by the CDB Tracking Committee. A memo nominating the Thesis advisory committee should be sent to the chair of the CDB Tracking Committee. Students must meet with their Thesis Advisory Committee within 6 months of passing the Qualifying Examination and at least once a year after the initial meeting. Thesis Advisory Committee meetings will usually involve an oral presentation by the student of thesis research goals and progress. During the initial meeting, one member of the committee should be selected to serve as chair of the committee. Following each committee meeting, the chair should prepare a brief memo evaluating the student's progress which should be sent to the Tracking Committee chair.

Thesis and Oral Thesis Examination: Candidates for the Ph.D. degree must present a written description of the experimental investigation carried out during their course of study in the form of a thesis. Information on the format of the thesis and oral thesis examination should be obtained from the office of the Associate Dean for Graduate Studies. Students who defend their thesis near the end of the spring term should note deadlines established by the School of Medicine. The thesis must demonstrate ability on the part of the student to plan and execute original experimental work, and the results must represent a definite contribution to scientific knowledge. Although there is flexibility in the amount of work required for the thesis, in general the thesis should represent the equivalent of at least two publications in significant, peer-reviewed journals.

CDB requires that the Thesis Advisory Committee must meet to review and approve the proposed thesis research before a thesis defense can be scheduled. The chair of the Thesis Advisory Committee should send a memo to the chair of the CDB Tracking Committee recording approval of the thesis project and approval for scheduling the oral thesis defense. The composition of the Oral Thesis Examining Committee should be suggested by the student and mentor, and must be approved by the CDB Tracking Committee and the department. After these approvals are obtained, final approval of the composition of this committee must be obtained from the Associate Dean for Graduate Studies.

Time limit for completing degree requirements. It is School of Medicine Graduate Council policy that students must complete all requirements for the Ph.D. within 7 years of matriculation. Students that do not complete degree requirements within this deadline may be dismissed from the graduate program. Students, mentors and the Thesis Advisory Committee should be considering this deadline when evaluating thesis research goals and progress.

Exceptions. No exceptions from the policies and procedures described in these guidelines can be made without approval by the CDB faculty. In matters related to coursework, exceptions must first be approved by the CDB tracking committee before review and consideration for approval by the CDB faculty.

**MOLECULAR AND MEDICAL GENETICS
ACADEMIC GUIDELINES AND EXPECTATIONS FOR Ph.D. STUDENTS
(YEARS 2+)**

These rules pertain to all students in the Department of Molecular and Medical Genetics (MMG) and are in partnership with the guidelines and requirements set forth by the Program in Molecular and Cellular Biosciences (PMCB) and the Graduate Council of the Oregon Health & Science University (OHSU) School of Medicine.

The Ph.D. program is organized as follows:

Year 1: Complete PMCB requirements

Year 2: Complete the PMCB Qualifying Examination
Undertake the research leading to the Ph.D. thesis
Complete required and elective courses
Attend and participate in Departmental Seminars and a journal club

Years 3+ Create a Thesis Advisory Committee
Continue research leading to the Ph.D. thesis
Attend and participate in Departmental Seminars and a journal club of choice closest to thesis work.

Required Graduate Courses in Molecular and Medical Genetics

*CON 665, 667 & 668 3 credits

* Two of these courses must be taken in Year 2 if it was not selected during Year 1 as part of the PMCB required courses.

Fall Term:

	Elective Courses	0-6 credits
MGEN 605A	Journal Club	1 credit
MGEN 607	Departmental Seminar	1 credit
MGEN 611	Departmental Grand Rounds	1 credit
MGEN 601	Research	7-11 credits
Second Year Fall Term Course Total		16 credits

Winter Term:

Elective Courses:

MGEN 622	Eukaryotic Genetics	0-4 credits
MGEN 605A	Journal Club	3 credits
MGEN 605B	Student Journal Club	1 credit
MGEN 611	Departmental Grand Rounds	1 credit
MGEN 607	Department Seminar	1 credit
MGEN 601	Research Second Year	5-9 credits
Winter Term Course Total:		16 credits

Spring Term 2005:

	Elective Courses	0-4 credits
MGEN 623	Mechanisms of Disease	4 credits
MGEN 605A	Journal Club	1 credit
MGEN 605B	Student Journal Club	1 credit
MGEN 611	Departmental Grand Rounds	1 credit
MGEN 607	Departmental Seminar	1 credit
MGEN 601	Research	4-8 credits
Second Year Spring Term Course Total:		16 credits

Summer Term Year 2:

CON 605	PMCB Qualifying Examination	8 credits
MGEN 601	Research	8 credits
Second Year Summer Term Course Total:		16 credits

Terms After Admission to Candidacy:

MGEN 605A	Journal Club	1 credit
MGEN 607	Departmental Seminar	1 credit
MGEN 601	Research	14 credits
Course Total:		16 credits

Summer Terms Through Completion:

MGEN 601	Research	16 credits
----------	----------	------------

Students are required to:

- 1) Attend monthly PMCB Seminar Series
- 2) Register for and attend MGEN 605B Student Journal Club during winter and spring terms of their 2nd year.
- 3) Register for and attend MGEN 605A Journal Club Year 2 through all years. Give a 30-minute presentation on their research once per year in all post-qualifying years.
- 4) Register for and attend the Departmental Seminar, MGEN 607, held at 4 PM Wednesdays, Years 2 through the end of the program.
- 5) Register for and attend Departmental Grand Rounds, MGEN 611, held at 9 AM Thursdays Year 2 through advancement to candidacy. Attendance is strongly encouraged, but optional, for the remaining years in the graduate program.

If a student wishes to be excused from taking a required course, the student and advisor should jointly petition the Graduate Curriculum Committee stating their reasons for wishing to be excused from the requirement. The Curriculum Committee will decide the issue by a majority vote.

Entering students are strongly encouraged to take the fall term MGEN 610 "Essentials of Molecular & Medical Genetics" as a means of becoming familiar with the discipline. However, students may elect to postpone this course to fall term of their second year.

The grade of Incomplete is reserved for circumstances beyond the control of the student (e.g. illness) preventing completion of the course requirements by the end of the term AND it is possible to complete the requirements within the subsequent term.

Students failing a semester of Research credits (i.e. receives an 'NP – No Pass' on research) are immediately placed on academic probation. To return to good standing, the student must obtain a passing grade on the next term of Research (and all subsequent terms). Failure to do so constitutes grounds for termination from the program.

Pre-qualifier Students: Students are required to notify and meet with their advisor immediately upon receiving an NP grade on Research. The advisor will suggest a course of action from correcting research performance.

Candidate Students: After advancing to candidacy, students receiving an NP grade in Research will schedule a Thesis Advisory Committee meeting to take place within two weeks of receipt of the NP grade in Research. The mentor and thesis advisory committee will suggest a course of action that the student must follow in correcting research performance.

The courses MGEN 605A Journal Club, MGEN 611 Grand Rounds, MGEN 607 Seminar and MGEN 610 Essentials of Molecular and Medical Genetics require documentation of attendance in order to be considered for the grade of 'Pass.' Post-qualifying, a student and advisor may petition the MMG Curriculum Committee to substitute another formal journal club. However, no credit will be received for the departmental journal club. A total of 3 absences each are allowed per term. A graduate student missing more than 3 will receive a failing grade of 'No Pass' and will be placed on immediate academic probation. The student must receive a 'Pass' the subsequent term and every term thereafter.

Following receipt of the first 'No Pass,' a pre-qualifying exam student must immediately meet with their TAC advisor; a post-qualifying exam student must immediately meet with their thesis advisory committee. A plan for insuring the attendance goal for the next term should be designed.

Two grades of 'No Pass' in any one of the three activities disqualifies a student from taking their qualifying exam, resulting in dismissal from the MMG Graduate Program.

Two grades of 'No Pass' in any one of the three activities for post-qualifying exam student may result in dismissal from the MMG Graduate Program.

Elective Courses

A total of 6 credit hours of elective courses are required to be eligible for the degree. Students are strongly encouraged to take at least one elective course during the fall term of their second year.

The following are only a few of the popular electives taken by some of the graduate students in MMG. Other courses available are listed in the course catalogue and graduate students are encouraged to speak to their TAC advisor or mentor when considering taking other courses. Some of the elective courses are offered every other year. To determine availability (if not listed) check with the MMG office.

MINF 571	Bioinformatics	Fall	3 credits
CELL 616	Cancer Biology,	Spring	3 credits
CON 654	Topics in Signal Transduction	Winter,	3 credits
MGEN 605D	Cardiovascular Genetics/Development Journal Club	Any term	1 credit
MGEN 620	Interview & Counseling Tech for Genetic Counseling	Winter	1 credit
MGEN 609	Clinical Experience in Medical Genetics	TBA	2 credits

Ph.D. Thesis Advisory Committee Guidelines

Within three months of passing the Ph.D. candidacy exam, the advisor and student must submit a suggested thesis advisory committee to the Graduate Curriculum Committee for approval. The following guidelines for the composition of the committee should be followed.

- A. The committee should include the advisor and at least 3 other faculty members who represent expertise relevant to the student's thesis project.
- B. All members of the advisory committee must be members of the OHSU Graduate Faculty. At least one member of the committee must NOT have an appointment in MMG.
- C. At least one member other than the advisor must be experienced in advising a Ph.D. thesis student; that is, he/she must have been a mentor for at least one student who has successfully completed their Ph.D.
- D. The student's mentor will serve as the Chair of the committee. The responsibilities of the chair are:
 - 1) To schedule and moderate the meetings.
 - 2) To submit a completed Thesis Advisory Committee meeting form to the GSC. Copies of the summary will be distributed to the student and the advisory committee members and the Chair of the Graduate Education Committee and a copy will be deposited in the student's file in the Department Office.

- E. The student must meet at least once per year with the Thesis Advisory Committee. Following completion of the third year, the student may meet more frequently on the recommendation of his/her Committee. One week prior to each committee meeting, the student should submit a summary of research accomplished and proposed to the GSC who will distribute it to committee members. Electronic submission to the GSC is acceptable.
- F. The Graduate Education Committee will be responsible for monitoring adherence to these guidelines.

MMG Preparation and Submission of Thesis

- A. All instructions and guidelines adopted by the Graduate Council By-Laws shall be followed carefully.
- B. In addition, the Department of Molecular and Medical Genetics requires the following actions in order for the student to present their dissertation:
 - 1) The student shall submit to the Graduate Student Coordinator (GSC), in person, as many copies of their thesis in final form as necessary (one copy per Thesis Advisory Committee Member). This shall not be a rough draft; all illustrations and legends need to be enclosed at this time. The GSC will record the date of submission on the MMG Thesis Submission Form and give a copy to the student, the student's mentor, and place a copy in the student's file. The GSC will then submit a copy of the thesis to each of the graduate student's Thesis Advisory Committee Members along with a MMG Thesis Approval form to the Committee Chair.
 - 2) The Thesis Advisory Committee Members shall have up to one month to review the thesis and return it to the student with their comments and guidelines for revision. Some revisions are normally required and can include the necessity for further experiments.
 - 3) After corrections and required revisions have been made, the student will resubmit the thesis to their Thesis Advisory Committee for two-week final review process. It is in the student's best interest to submit a well-thought out, prepared thesis that incorporates the requirements and suggestions of the Thesis Advisory Committee at this time, in order to prevent further time delays. If the revised thesis is still not deemed satisfactory by the Committee, the process will continue as stated above, allowing up to two weeks for each subsequent review.
 - 4) All members of the Thesis Advisory Committee must sign the Thesis Approval Form. The student may proceed to defense with no more than one Thesis Advisory Committee Member deeming the thesis unsatisfactory. The Thesis Approval Form will then be submitted to the MMG Director of Graduate Education (DGE) via the GSC, thus indicating that the student may proceed to the next step toward the defense.
 - 5) The Thesis Advisory Committee will submit to the GSC at this time a list of members for the Thesis Examination Committee along with a suggestion for the Thesis Examination Chairperson, in the area provided on the Thesis Approval Form. The Chairperson cannot be a member (or a joint appointee) of the Department of Molecular and Medical Genetics. The appointment of the chairpersons will be greatly facilitated by suggesting well qualified experts from outside of the Department who are capable of reviewing the thesis in the respective time frame desired.
 - 6) The DGE (or designee) will make the appointment of the Thesis Examination Chairperson, upon the receipt of the Thesis Approval Form from the GSC. The DGE will then notify the GSC of the Thesis Examination Committee Members and the Thesis Examination Chairperson. The GSC will inform the student who will then contact the Committee to select an available time for the Thesis Defense. Once this information has been obtained, the GSC will complete the Request for Oral Thesis Examination Form and submit it to the DGE for approval. The DGE will then forward it on to the Associate Dean of Graduate Studies. The submission of this form to the Dean's Office must be at least four weeks

prior to the date of the exam. It is recommended that at this time, the student submit a copy of their revised and approved thesis to the GSC for distribution to the Thesis Examination Committee. The student must submit their approved thesis no later than two weeks before the examination in order for the exam to take place as scheduled. The GSC will record the date of submission and make sure that the student is in compliance with these guidelines. If the student is not in compliance with these guidelines, the GSC will notify the DGE. The DGE will then determine the proper course of action with the possibility of postponing the exam until the Committee has had at least two weeks to review the thesis (dependent upon the Committee Members availability).

MISCELLANEOUS

Grievances:

The procedure for handling grievances is outlined in the OHSU Graduate Studies Handbook.

Extracurricular employment:

The Department of Molecular and Medical Genetics consider employment as a graduate student in the Ph.D. program to represent full time employment. Students are strongly discouraged from seeking outside employment. Any student wishing to pursue outside employment must submit a written request to the TAC advisor and/or mentor, the Director of Graduate Education, and the Chairman of MMG. The student must receive written authorization from the above individuals prior to accepting employment.

Masters Degree:

The OHSU Department of Molecular and Medical Genetics does not routinely offer a masters degree. Under special circumstances, a graduate student may petition the Graduate Education Committee in writing to allow the student to complete a terminal master's degree. Approval of this request by the Graduate Education Committee must be unanimous.

In the rare case where a master's degree is offered, the student is required to pass a candidacy examination, following the same procedures as outlined for a doctoral candidacy examination. The same rigorous standards apply to student performance in a master's candidacy examination as in a doctoral thesis candidacy examination. Students failing a candidacy examination will not be candidates for a master's degree. A written thesis is required to earn a master's degree. In addition, a master's thesis defense examination must take place, with the same requirements as for the doctoral thesis, except the number of credit hours required (45 vs. 135 credit hours). A thesis advisory committee is required, the composition of which is in keeping with section IV C of these guidelines.

MOLECULAR MICROBIOLOGY & IMMUNOLOGY
ACADEMIC GUIDELINES & EXPECTATIONS FOR Ph.D. STUDENTS
(Years 2+)

These rules pertain to all students in the Department of Molecular Microbiology and Immunology and are in partnership with the guidelines and requirements set forth by the Program in Molecular and Cellular Biosciences (PMCB) and the Graduate Council of the Oregon Health and Science University (OHSU) School of Medicine.

The Ph.D. program is organized as follows:

Year 1: Complete PMCB requirements

Year 2: Complete the PMCB Qualifying Examination
Undertake the research leading to the Ph.D. thesis
Complete required and elective courses
Attend and participate in Departmental Seminars and a journal club

Year 3+: Create a Thesis Advisory Committee
Continue research leading to the Ph.D. thesis
Attend and participate in Departmental Seminars and a journal club of choice closest to thesis work

REQUIRED GRADUATE COURSES IN MOLECULAR MICROBIOLOGY & IMMUNOLOGY

*CONJ 665, 667 & 668 3 credits

Two of these courses must be taken in Year 2, if it was not selected during Year 1 as part of the PMCB required courses.

Fall Term:

Elective Courses		0-4 credits
MBIM 601	Research	8-12 credits
MBIM 605	Journal Club	1 credit
<u>MBIM 607</u>	<u>Departmental Seminar</u>	<u>1 credit</u>
Second Year Fall Term Course Total:		16 credits

Winter Term:

Elective Courses		0-4 credits
MBIM 610	Introduction to Immunology	2 credits
MBIM 601	Research	8-12 credits
MBIM 605	Journal Club	1 credit
<u>MBIM 607</u>	<u>Departmental Seminar</u>	<u>1 credit</u>
Second Year Winter Term Course Total:		16 credits

Spring Term 2005:

Elective Courses		0-4 credits
MBIM XXX		
MMI elective	Virology & Advanced Genetics	4 credits
MBIM 601	Research	8-12 credits
MBIM 605	Journal Club	1 credit
<u>MBIM 607</u>	<u>Departmental Seminar</u>	<u>1 credit</u>
Second Year Spring Term Course Total:		16 credits

Summer Term Year 2:

CON 605	PMCB Qualifying Examination	8 credits
<u>MBIM 601</u>	<u>Research</u>	<u>8 credits</u>
Second Year Summer Term Course Total:		16 credits

Terms After Admission to Candidacy:

MBIM 601	Research OR	8-12 credits
MBIM 603	Dissertation	8-12 credits
MBIM 605	Journal Club	1 credit
<u>MBIM 607</u>	<u>Departmental Seminar</u>	<u>1 credit</u>
Course Total:		16 credits

Summer Term Through Completion:

MBIM 601 Research OR	8-12 credits
MBIM 603 Dissertation	8-12 credits

Notes to Course Requirements

Students are required to:

- 1) Attend monthly PMCB Seminar Series
- 2) Register for and attend MBIM 605 Student Journal Club every term.
- 3) Register for and attend the Departmental Seminar, MBIM 607 through end of program.

If a student wishes to be excused from taking a required course, the student and advisor should jointly petition the Graduate Curriculum committee stating their reasons for wishing to be excused from the requirement. The Curriculum Committee will decide the issue by majority vote.

Entering students are strongly encouraged to take the fall term MBIM 610 "Introduction to Immunology" as a means of becoming familiar with the discipline. However, students may elect to postpone this course to fall term of their second year.

The grade of Incomplete is reserved for circumstances beyond the control of the student, (e.g. illness) preventing completion of the course requirements by the end of the fall term AND it is possible to complete the requirements within the subsequent term.

Students failing a semester of research credits, (i.e. receives an 'NP- No Pass' on research) are immediately placed on academic probation. To return to good standing, the student must obtain a passing grade on the next term of Research (and all subsequent terms). Failure to do so constitutes grounds for termination from the program.

Pre-qualifier Students:

Students are required to notify and meet with their advisor immediately upon receiving an NP grade on Research. The advisor will suggest a course of action for correcting research performance.

Candidate Students:

After advancing to candidacy, students receiving an NP grade in Research will schedule a Thesis Advisory Committee meeting to take place within two weeks of receipt of the NP grade in Research. The Mentor and Thesis Advisory Committee will suggest a course of action that the student must follow in correcting research performance.

The courses MBIM 605 Journal Club, MBIM 607 Seminar require documentation of attendance in order to be considered for the grade of 'Pass.' Post-qualifying, a student and advisor may petition the MMI Curriculum Committee to substitute another formal journal club. However, no credit will be received for the departmental journal club. A total of 3 absences each are allowed per term. A graduate student missing more than 3 will receive a failing grade of 'No Pass' and will be placed on

immediate academic probation. The student must receive a 'Pass' the subsequent term and every term thereafter.

Following receipt of the first 'No Pass,' a pre-qualifying exam student must immediately meet with their TAC advisor; a post-qualifying exam student must immediately meet with their thesis advisory committee. A plan for insuring the attendance goal for the next term should be designed.

Two grades of 'No Pass' in any one of the three activities disqualifies a student from taking their qualifying exams, resulting in dismissal from the MMI Graduate Program.

Two grades of 'No Pass' in any one of the three activities for a post-qualifying exam student may result in dismissal from the MMI Graduate Program.

Elective Courses:

MMI requires that students complete at least three (3) elective courses, outside of the con joint classes, offered by MMI or other departments. Students are strongly encouraged to take at least one elective course during fall terms of their second year.

The MMI elective courses are: MBIM 608 – Advanced Virology 4 Credits MBIM 610 – Introduction to Immunology 2 Credits MBIM 611 – Concepts in Microbial Pathogenesis 4 Credits MBIM 612 – Advanced Immunology 4 Credits MBIM 614 – Advanced Molecular Genetics 4 Credits

Ph.D. Thesis Advisory Committee Guidelines

Within three months of passing the Ph.D. candidacy exam, the advisor and student must submit a suggested thesis advisory committee to the Graduate Curriculum Committee for approval. The following guidelines for the composition of the committee should be followed.

- A. The committee should include the advisor and at least 3 other faculty members who represent expertise relevant to the student's thesis project.
- B. All members of the advisory committee must be members of the OHSU Graduate Faculty. At least one member of the committee must NOT have an appointment in MMI.
- C. At least one member other than the advisor must be experienced in advising a Ph.D. thesis student; that is, he/she must have been a mentor for at least one student who has successfully completed their Ph.D.
- D. The student's mentor will serve as the Chair of the committee. The responsibilities of the chair are:
 - a. To schedule and coordinate the meetings
 - b. To submit a completed Thesis Advisory Committee meeting summary to the GSC. Copies of the summary will be distributed to the student and the advisory committee members and the Chair of the Graduate Education Committee and a copy will be deposited in the student's file in the Department Office.
- E. The student must meet at least once per year with the Thesis Advisory Committee. Following completion of the third year, the student may meet more frequently on the recommendation of his/her committee. One week prior to each committee meeting, the student should submit a summary of research accomplished and proposed to the GSC who will distribute it to committee members. Electronic submission to the GSC is acceptable.
- F. The Graduate Education Committee will be responsible for monitoring adherence to these guidelines.

MMI Preparation and Submission of Thesis:

- A. All instructions and guidelines adopted by the Graduate Council By-Laws shall be followed carefully.

- B. In addition, the Department of Molecular Microbiology and Immunology requires the following actions in order for the student to present their dissertation:
- a. The student shall submit to the Graduate Student Coordinator (GSC), in person, as many copies of their thesis in final form as necessary (one copy per Thesis Advisory Committee Member). This shall not be a rough draft; all illustrations and legends need to be enclosed at this time. The GSC will record the date of submission on the MMI Thesis Submission Form and give a copy to the student, the student's mentor, and place a copy in the student's file. The GSC will then submit a copy of the thesis to each of the graduate student's Thesis Advisory Committee Members along with a MMI Thesis Approval form to the Committee Chair.
 - b. The Thesis Advisory Committee Members shall have up to one month to review the thesis and return it to the student with their comments and guidelines for revision. Some revisions are normally required and can include the necessity for further experiments.
 - c. After corrections and required revisions have been made, the student will resubmit the thesis to their Thesis Advisory Committee for two-week final review process. It is in the student's best interest to submit a well-thought out, prepared thesis that incorporates the requirements and suggestions of the Thesis Advisory Committee at this time, in order to prevent further time delays. If the revised thesis is still not deemed satisfactory by the Committee, the process will continue as stated above, allowing up to two weeks for each subsequent review.
 - d. All members of the Thesis Advisory Committee must sign the Thesis Approval Form. The student may proceed to defense with no more than one Thesis Advisory Committee Member deeming the thesis unsatisfactory. The Thesis Approval Form will then be submitted to the MMI Director of Graduate Education (DGE) via the GSC, thus indicating that the student may proceed to the next step toward the defense.
 - e. The Thesis Advisory Committee will submit to the GSC at this time a list of members for the Thesis Examination Committee along with a suggestion for the Thesis Examination Chairperson, in the area provided on the Thesis Approval Form. The Chairperson cannot be a member (or a joint appointee) of the Department of Molecular Microbiology and Immunology. The appointment of the chairpersons will be greatly facilitated by suggesting well qualified experts from outside of the Department who are capable of reviewing the thesis in the respective time frame desired.
 - f. The DGE (or designee) will make the appointment of the Thesis Examination Chairperson, upon the receipt of the Thesis Approval Form from the GSC. The DGE will then notify the GSC of the Thesis Examination Committee Members and the Thesis Examination Chairperson. The GSC will inform the student who will then contact the Committee to select an available time for the Thesis Defense. Once this information has been obtained, the GSC will complete the Request for Oral Thesis Examination Form and submit it to the DGE for approval. The DGE will then forward it on to the Associate Dean of Graduate Studies. The submission of this form to the Dean's Office must be at least four weeks prior to the date of the exam. It is recommended that at this time, the student submit a copy of their revised and approved thesis to the GSC for distribution to the Thesis Examination Committee. The student must submit their approved thesis no later than two weeks before the examination in order for the exam to take place as scheduled. The GSC will record the date of submission and make sure that the student is in compliance with these guidelines. If the student is not in compliance with these guidelines, the GSC will notify the DGE. The DGE will then determine the proper course of action with the possibility of postponing the exam until the Committee has had at least two weeks to review the thesis (dependent upon the Committee Members availability).

MISCELLANEOUS

Grievances:

The procedure for handling grievances is outlined in the OHSU Graduate Studies Handbook.

Extracurricular employment:

The Department of Molecular Microbiology and Immunology consider employment as a graduate student in the Ph.D. program to represent full time employment. Students are strongly discouraged from seeking outside employment. Any student wishing to pursue outside employment must submit a written request to the TAC advisor and/or mentor, the Director of Graduate Education, and the Chairman of MMI. The student must receive written authorization from the above individuals prior to accepting employment.

PHYSIOLOGY & PHARMACOLOGY
ACADEMIC GUIDELINES AND EXPECTATIONS FOR Ph.D. STUDENTS
(Years 2+)
 Revised August 2009

The following pages outline the Guidelines governing all students electing to pursue the Ph.D. in the Graduate Program of the Department of Physiology and Pharmacology (PHPH). All students must complete the requirements described for the Program in Molecular and Cellular Biosciences (PMCB) and the Graduate Council of the Oregon Health and Science University (OHSU) School of Medicine.

The Ph.D. program is organized as follows:

- Year 1:** Complete PMCB requirements
- Year 2:** Complete the PMCB Qualifying Examination
 Undertake the research leading to the Ph.D. thesis
 Complete required and elective courses
 Attend and participate in Departmental Seminars and a journal club
- Year 3+:** Create a Thesis Advisory Committee
 Continue research leading to the Ph.D. thesis
 Attend and participate in Departmental Seminars and a journal club of choice closest to thesis work

REQUIRED GRADUATE COURSES IN PHYSIOLOGY AND PHARMACOLOGY

*CON 667	Organ Systems	OR	3 credits
*CON 669	Chemical Biology		3 credits
Fall Term Year 2:			
PHPH 617:	Pharmacokinetics		2 credits
PHPH 605	Research Colloquium/Journal Club		1 credit
PHPH 607	Departmental Seminar		1 credit
PHPH 601	Research		8-12 credits
	Elective courses		0-4 credits
Second Year Fall Term Course Total:			16 credits
Winter Term Year 2:			
PHPH 618	Receptor Pharmacology		2 credits
PHPH 605	Research Colloquium /Journal Club		1 credit
PHPH 607	Departmental Seminar		1 credit
PHPH 601	Research		10-12 credits
	Elective Courses		0-4 credits
Second Year Winter Term Course Total:			16 credits
Spring Term Year 2:			
PHPH 605	Research Colloquium /Journal Club		1 credit
CON 667 OR CON 669			0-3 credits
<i>(Taken in Year 2 if not selected during Year 1 as part of the PMCB required courses).</i>			
PHPH 607	Departmental Seminar		1 credit
PHPH 601	Research		7-14 credits
	Elective Courses		0-4 credits
Second Year Spring Term Course Total:			16 credits

Summer Term Year 2:

CON 605	PMCB Qualifying Exam	8 credits
PHPH 601	Research	8 credits
Second Year Summer Term Course Total:		16 credits

Terms After Admission to Candidacy:

PHPH 605	Research Colloquium /Journal Club	1 credit
PHPH 607	Departmental Seminar	1 credit
PHPH 601	Research	14 credits
Course Total		16 credits

PHPH SPECIFIC COURSE REQUIREMENTS:

Students are required to:

- a. Register for and attend PHPH 605 Research Focus Group / Journal Club Years 2 through the duration of the program. Students are required to give at least one 30-minute presentation on their research once per year in all post-qualifying years as part of the PHPH Graduate Student Seminar Series.
- b. Register for and attend the Departmental Seminar, PHPH 607, Years 2 through duration of program
- c. Register for and complete CON 667 and 669 during the spring of years 1 or 2.
- d. Students are required to take two PHPH courses:
 - i. **PHPH 617:** Pharmacokinetics (2 credits, fall term) This course will provide students with an introduction to drug absorption, distribution, metabolism, and elimination.
 - ii. **PHPH 618:** Receptor Pharmacology (2 credits, winter term). This course will provide students with an introduction to the molecular mechanisms of drug action and the principles of drug – receptor interactions.
- e. Students wishing to be excused from taking a required course may petition the PH2 Steering Committee stating their reasoning. A majority vote of the Steering Committee is required for approval.
- f. Students must receive a grade of A or B in all required courses. Students not receiving an A or B in a required course must repeat that course the following year and failure to do so constitutes grounds for termination from the program. The required courses in PHPH for which this rule applies are PHPH 617 and 618.
- g. The grade of Incomplete is reserved for circumstances beyond the control of the student, (e.g. illness) preventing completion of the course requirements by the end of the fall term AND it is possible to complete the requirements within the subsequent term.
- h. Students failing a semester of research credits, (i.e. receives an ‘NP- No Pass’ on research) are immediately placed on academic probation. To return to good standing, the student must obtain a passing grade on the next term of Research (and all subsequent terms). Failure to do so constitutes grounds for termination from the program

Pre-qualifier Students:

Students are required to notify and meet with their advisor immediately upon receiving an NP grade on Research. The advisor will suggest a course of action for correcting research performance.

Candidate Students:

After advancing to candidacy, students receiving an NP grade in Research will schedule a Thesis Advisory Committee meeting to take place within two weeks of receipt of the NP grade in Research. The Mentor and Thesis Advisory Committee will suggest a course of action that the student must follow in correcting research performance.

The courses PHPH 605 Research Focus Groups/Journal Club and PHPH 607 Seminar require documentation of attendance in order to be considered for the grade of 'Pass.' Candidate students and their advisor may petition the PHPH Curriculum Committee to substitute another formal journal club. However, no credit will be received for the departmental journal club. A total of 3 absences each are allowed per term. A graduate student missing more than 3 will receive a failing grade of 'No Pass' and will be placed on immediate academic probation. The student must receive a 'Pass' the subsequent term and every term thereafter.

Following receipt of the first 'No Pass,' a pre-qualifying exam student must immediately meet with their TAC advisor; a post-qualifying exam student must immediately meet with their thesis advisory committee. A plan for insuring the attendance goal for the next term should be designed.

Two NP grades results in the immediate initiation of dismissal proceedings from the PHPH Graduate Program.

ELECTIVE COURSES

A total of 8 credit hours of elective courses from any program are required to be eligible for the degree. Students are strongly encouraged to complete the elective courses during their second year. The following are some of the electives taken by the graduate students in PHPH. Other courses are listed in the course catalogue and graduate students are encouraged to speak to their mentor and/or graduate program director when considering other courses. Some of the elective courses are offered every other year.

PHPH 614: Neurophysiology and Pharmacology of Pain (2 credits, TBA) Course focused on functional organization of nociceptive pathways.

PHPH 619: Topics in Autonomic Physiology & Pharmacology (3 credits, Spring alternate years) This advanced topics course surveys the function and regulation of the autonomic nervous system, and the basis for autonomic drug actions. Topics can include autonomic control of cardiovascular function, energy balance, thermoregulation, respiration, and others.

PHPH 622: Ion Channels and Genetic Diseases (2 credits, TBA) The course introduces the basic concepts of ion channel function in the context of the origin of inherited diseases and consider how alterations in channel function produce pathophysiological states, such as cystic fibrosis, myotonias and cardiac arrhythmia and the potential bases for therapeutics and directed drug development.

PHPH 630: Advanced Organic Synthesis (4 credits, Spring) This course deals with advanced organic synthesis methods and synthetic planning and execution strategies for complex target compound synthesis. The goal of the course is that students will emerge with a practical understanding of how to apply the tools of organic synthesis to their research.

Ph.D. Thesis Advisory Committee Guidelines

Within three months of passing the Ph.D. candidacy exam, the advisor and student must submit a suggested thesis advisory committee to the PH2 Steering Committee for approval. Upon approval, the student must submit a "Request for Advisory Committee" form. The following guidelines for the composition of the committee should be followed.

- A. The committee should include the advisor and at least 3 other faculty members who represent expertise relevant to the student's thesis project.
- B. All members of the advisory committee must be members of the OHSU Graduate Faculty. At least one member of the committee must NOT have an appointment in PHPH.

- C. At least one member other than the advisor must be experienced in advising a Ph.D. thesis student; that is, he/she must have been a mentor for at least one student who has successfully completed their Ph.D.
- D. The student's mentor will not serve as the Chair of the committee. The responsibilities of the chair are:
 - a. To schedule and coordinate the meetings
 - b. To submit a completed Thesis Advisory Committee meeting summary to the Graduate Student Coordinator (GSC). Copies of the summary will be distributed to the student and the advisory committee members and the PH2 Program Director and a copy will be deposited in the student's file in the Department Office.
- E. The student must meet at least once per year with the Thesis Advisory Committee. Following completion of the third year, the student may meet more frequently on the recommendation of his/her committee. One week prior to each committee meeting, the student should submit a summary of research accomplished and proposed to committee members. A copy should also be submitted to the Graduate Student Coordinator.
- F. The Steering Committee will be responsible for monitoring adherence to these guidelines.

Preparation and Submission of Thesis:

- A. All instructions and guidelines adopted by the Graduate Council By-Laws shall be followed carefully.
- B. The formatting of the thesis should comply with the standards set out by the SOM graduate council:
<http://www.ohsu.edu/xd/education/schools/school-of-medicine/academic-programs/graduate-studies/students/upload/Guidelines-8-2008-rev-7-2009.pdf>
- C. In addition, the Department of Physiology and Pharmacology requires the following actions in order for the student to present their dissertation:
 1. The student must meet with their Thesis Advisory Committee and receive permission from the entire committee to begin writing their thesis.
 2. The student will work with their mentor to write the thesis, and re-write as necessary, prior to the committee receiving the draft thesis.
 3. The Graduate Student Coordinator will complete a Request for Oral Thesis Examination Form and submit it to the PH2 Program Director for approval. The PH2 Program Director will then forward it on to the Associate Dean of Graduate Studies. The submission of this form to the Dean's Office must be at least four weeks prior to the date of the exam. It is recommended that at this time, the student submit a copy of their thesis to the Thesis Examination Committee. The student must submit their thesis no later than two weeks before the examination in order for the exam to take place as scheduled.
 4. The Thesis Advisory Committee will submit to the Graduate Student Coordinator a list of members for the Thesis Examination Committee along with a suggestion for the Thesis Examination Chairperson, in the area provided on the Thesis Approval Form. The Chairperson cannot be a member of the Department of Physiology and Pharmacology. The appointment of the chairpersons will be greatly facilitated by suggesting well qualified experts from outside of the Department who are capable of reviewing the thesis in the respective time frame desired.
 5. The PH2 Program Director (or designee) will make the appointment of the Thesis Examination Chairperson, upon the receipt of the Thesis Approval Form from the Graduate Student Coordinator. The Thesis Advisory Committee Members shall review the thesis prior to the defense and return it to the student with their comments and guidelines for revision. The comments should be returned to the student no later than the oral defense date. Some revision is normally required.

6. After the post-defense corrections and required revisions have been made, the student will re-submit the thesis to their Thesis Advisory Committee for a final review process that is to be completed within two weeks of committee members receiving the thesis.
7. All members of the Thesis Advisory Committee must sign the Thesis Approval Form.

MISCELLANEOUS

Grievances:

The procedure for handling grievances is outlined in the OHSU Graduate Studies Handbook.

Extracurricular employment:

The Department of Physiology and Pharmacology considers employment as a graduate student in the Ph.D. program to represent full time employment. Students are strongly discouraged from seeking outside employment. Any student wishing to pursue outside employment must submit a written request to the TAC advisor and/or mentor, the Director of the PH2 Graduate Program, and the Chairman of Physiology and Pharmacology. The student must receive written authorization from the above individuals prior to accepting employment.

Master's Degree

The OHSU Department of Physiology and Pharmacology does not routinely offer a Masters degree. Under special circumstances, a student may petition the Graduate Education Committee in writing to allow the student to complete a terminal Masters degree. Approval of this request by the PH2 Steering Committee must be unanimous. A written thesis and oral thesis defense examination are required to earn a Master's degree. A minimum of 80 completed credit hours is required for the Master's degree. A thesis advisory committee is required, the composition of which is in keeping with the guidelines for PhD thesis advisory committees.