Graduate Program in Molecular & Cellular Pathology

Student and Faculty Handbook

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General Information

About the Graduate Program

Students are admitted to the Graduate Program in Molecular and Cellular Pathology through the Program in Biomedical Sciences (PIBS). The graduate degree attained by students in the Pathology Graduate Program is the Doctor of Philosophy Degree in Pathology through the Horace H. Rackham School of Graduate Studies. The Graduate Program in Pathology at the University of Michigan trains individuals for careers as independent scientific investigators, with a focus on the study of the molecular and cellular mechanisms of disease processes or abnormal biology. This area of study encompasses the basic science mission of the Department of Pathology to advance current knowledge on the etiology and pathogenesis of human disease.

The primary goal of the Pathology Graduate Program is to train investigators for an academic career. However, the program is based broadly enough to allow graduates to pursue careers in industry and government, in addition to academic teaching and research. Student’s training in disease models and processes has made them invaluable in assessing drug efficacy and toxicity; hence, a significant number of these individuals take positions in pharmaceutical companies. Governmental research and regulatory agencies also benefit from this expertise, partly for the same reasons as the drug companies, and partly for their basic (i.e. non-applied) research skills.

Sequence of Program

The course programs are formulated to meet the needs and specialized interests of individual students. A few required didactic courses provide students with a background in basic areas of biochemistry, cell biology, immunology, and genetics in preparation for in-depth study of the cellular and molecular pathogenesis of disease. Beyond that, students are free to tailor their coursework and research to their specific areas of interest.

During the pre-candidacy period, students gain research experience and identify their areas of interest through participating in research rotations. They may select from a wide array of specialized courses offered at the Medical School and throughout the University. By the end of the pre-candidacy period the student will have selected a thesis advisor, passed preliminary exams, and will be prepared to start his or her own thesis research. Typically, the student obtains a Ph.D. in Pathology in four or five years.

Graduate Program Faculty

The research interests of the faculty are diverse and include investigative programs in tissue injury and repair, inflammation, aging, tumor biology, apoptosis, regulation of gene expression in disease processes, the biology and pathobiology of cytokines, adhesion molecules, extracellular matrix, drug discovery and development. Many of the nearly 35 Pathology graduate
program faculty also hold joint appointments with other biomedical science departments at the University of Michigan, offering students an interdisciplinary approach to their training.

Many of the Pathology Graduate Program faculty maintain websites devoted to ongoing research in their laboratories. Interested students can obtain additional information about the faculty and their research at [http://www.pathology.med.umich.edu/gradprogram/faculty/](http://www.pathology.med.umich.edu/gradprogram/faculty/).

**Graduate Program Committees and Organization**

**Graduate Program Advisory Committee:**
The Molecular and Cellular Pathology Graduate Program is administered by the Graduate Program Advisory Committee. The faculty chair of the program committee is appointed by the Chairman of the Department of Pathology. The faculty chair appoints additional faculty members. Functions: set policies, rules and regulations regarding the program; oversee operation of the program; appoint chairs to other graduate program committees; finalize decisions regarding applications and admissions.

Current Committee:  
Zaneta Nikolovska-Coleska, Ph.D. - Chair  
Steve Kunkel, Ph.D. - Faculty Representative  
Thomas Wilson, M.D., Ph.D. - Faculty Representative  
Nicholas Lukacs, Ph.D. - Chair Admissions  
Kathleen Cho, M.D. - Interim Department Chair

**Preliminary Examination Committee:**
The program committee chair appoints a faculty chair to the Preliminary Examination Committee. The exam committee chair appoints faculty who serve as members. Function: Organize and administer the preliminary examinations required of all graduate students to achieve candidacy.

Current Committee:  
David Ferguson, M.D., Ph.D. – Chair  
Yali Dou, Ph.D. – Faculty Representative  
Greg Dressler, Ph.D. – Faculty Representative  
Nicholas Lukacs, Ph.D. - Faculty Representative  
David Lombard, M.D., Ph.D. – Faculty Representative  
Zaneta Nikolovska-Coleska, Ph.D. – Faculty Representative  
Thomas Wilson, M.D., Ph.D. - Faculty Representative  
Maria Figueroa, M.D. - Faculty Representative  
Michael Bachman, M.D., Ph.D. - Faculty Representative
Pathology Graduate Program Curriculum Revision Committee:
The program committee chair also serves as chair to the Pathology Graduate Program Curriculum Revision Committee. The chair of the curriculum revision committee appoints additional faculty members to serve on the committee. Function: Review and revise pathology courses in the graduate program curriculum.

Current Committee: Zaneta Nikolovska-Coleska, Ph.D. – Chair
David Lombard, M.D. – Faculty Representative
Gregory Dressler, Ph.D. – Faculty Representative
Nicholas Lukacs, Ph.D. – Faculty Representative
Thomas Wilson, M.D., Ph.D. – Faculty Representative
David Ferguson, M.D., Ph.D. – Faculty Representative

PIBS Academic Advisors (PIBS Curriculum Committee):
The chair of the program committee serves also as the primary PIBS Academic Advisor. The chair will also appoint one additional faculty member to serve as backup. Function: Advise students on required PIBS and Pathology coursework and minimum requirements, rotations, and selecting labs and mentors; review student’s course selections and sign off on PIBS election form; answer any questions that student’s may have about coursework and research rotations.

Current Committee: Zaneta Nikolovska-Coleska, Ph.D. – Primary
Nicholas Lukacs, Ph.D. - Backup

PIBS Operating Committee:
The chair of the program committee appoints one faculty member to represent the Pathology Graduate Program on the PIBS Operating Committee. It is comprised of representatives for the 14 participating programs and makes the overall policy decisions. Function: Decision-making board for PIBS.

Pathology Representative: Zaneta Nikolovska-Coleska, Ph.D.

PIBS Admissions Committee
The chair of the program appoints the chair of the admissions committee and together they select two additional members of the PIBS admissions committee. Function: Review and make decisions on applicants and admissions.

Current Committee: Nicholas Lukacs, Ph.D. – Chair
Elizabeth Lawlor, M.D., Ph.D. - Faculty Representative
Andrew Muntean, Ph.D. - Faculty Representative
Zaneta Nikolovska-Coleska, Ph.D. - Faculty Representative
Academic Policies and Procedures

Academic Advisors

During pre-candidacy the academic advisor for the Pathology Graduate Program is Professor Zaneta Nikolovska-Coleska, Ph.D. (Faculty back-up advisor: Nicholas Lukacs, Ph.D.) After the student has achieved candidacy, the student’s mentor will serve as advisor, in conjunction with the Pathology Graduate Office. Any questions or problems regarding course requirements can be directed to Dr. Nikolovska-Coleska, Dr. Lukacs or Laura Labut.

Zaneta Nikolovska-Coleska, Ph.D.          zanetan@med.umich.edu          (734) 615-3860
Laura Labut                               laszczem@med.umich.edu         (734) 763-6454

Credit Hours

All students who have not achieved candidacy must enroll for a minimum of 9 credit hours in each of the fall and winter terms. Candidates must enroll for 8 credit hours of Pathology 995 (“Dissertation Research”) each of the fall and winter terms.

Candidates may elect one “free” course per fall or winter term without being assessed additional tuition. Candidates enrolling in more than one course with Pathology 995 will be assessed additional tuition and therefore must have all additional course work approved by their mentor. See “Candidacy Course Registration”, Section 5.4.2, Rackham Graduate School Academic Policies for more information.

Pre-doctoral students must accumulate a minimum of 18 credits of graded graduate coursework in residence to be recommended for candidacy. This includes courses graded on a satisfactory basis. Courses that are audited do not meet the requirement, nor do doctoral courses such as PATH 990 or 995. See “Coursework in Residence”, Section 5.1.1, Rackham Graduate School Academic Policies for more information.

In accordance with Rackham Graduate School requirements, all candidates must be enrolled during the term in which they intend to defend their Ph.D. thesis.

Grade Point Average

During the summer of 2013 the Rackham Graduate School converted the grading system from a nine point scale to a four point scale. Any student earning a degree starting in August 2013 will graduate using the new grading system. Grades for prior coursework taken under a Rackham registration will be automatically converted to the new scale. More information can be found at http://www.rackham.umich.edu/policies/gpa/.
Academic Standing

To maintain satisfactory academic standing, graduate students must make satisfactory progress towards their degrees and maintain a minimum Rackham cumulative grade point average of “B” (3.0).

All didactic coursework for the Molecular and Cellular Pathology graduate program must be passed with a minimum grade of “B” (3.0).

Student Performance Evaluation

During the pre-candidacy period the progress of the student will be evaluated by reviewing their grades, individual research rotation evaluations and preliminary exam results. During the candidacy period performance will be evaluated based on the yearly dissertation committee meeting. The evaluation period will be the academic year (September through August).

Transfer Students

Graduate students from other Departments or Programs within the University of Michigan’s Horace Rackham School for Graduate Studies who wish to transfer to the Molecular and Cellular Pathology Graduate Program should contact the Pathology Program Director. The Graduate Program Committee will review the student’s academic file. If a transfer is approved, the student will be responsible for completing all of the Pathology program requirements as detailed in the program handbook.

Cognate Requirement

Before advancing to candidacy, students must complete 4 credit hours of cognate coursework with a grade of B- or better. Cognate courses are those that are in a discipline or area different from a student's field of study but are related or connected with some aspect of this field. All cognate coursework must be approved by the department or program. Cognate requirements may be satisfied in three ways:

1. By completing 4 credit hours of cognate coursework in approved graduate-level courses with a grade of B- or better.
2. By using coursework within the same department or program but in a subfield different from the student's own. A course in a student's program that is cross-listed as a course in another program may satisfy the cognate requirement.
3. By completing graduate coursework at another institution that meets the expectation of the cognate requirement, without transferring the credit to the transcript. The student must provide Rackham OARD with an official transcript including the courses, credit hours, and the department or program should notify Rackham OARD. These courses do not apply toward the minimum 18 credit hour requirement for the degree and do not appear on the University transcript.
Proposed Curriculum for PIBS Students in MCP Program

The Molecular and Cellular Pathology Graduate Program has a diverse research faculty who investigate a broad range of disease topics. Therefore, we strive to be flexible with our required coursework in order to tailor the curriculum to complement each student's chosen field of research. This is accomplished by allowing students to choose electives with the help of departmental academic advisors to fulfill both MCP program and Rackham Graduate School requirements.

Rackham required credits: a minimum of 18 credit hours for candidacy including 4 credit hours of Cognate course work
Preliminary exams: written and oral

The basic required coursework consists of:

At least two of the following PIBS core courses* (approved by grad program Chair) taken in the fall of the first year:
- 3 credits of Biochemistry (Biological Chemistry 550)
- 3 credits of Genetics (Human Genetics 541)
- 3 credits of Cell and Developmental Biology (CDB 530)

*These courses will satisfy the Cognate Requirement. These courses are not necessary for MSTP students.

In addition to two of the above PIBS core courses, the Molecular and Cellular Pathology Program also requires additional courses:

1. Pathology 581 Tissue, Cellular and Molecular Basics of Disease (Winter, 3 credits)
This course introduces students to basic pathophysiologic mechanisms, the molecular basis for disease and the morphologic expression of human disease. The course will begin with a review of normal histology and then focus on a rigorous presentation of cellular and molecular mechanisms which appear to be common to a number of diseases including cell response and injury, inflammation and immunity, infectious disease, disturbances of the circulation and neoplasia. Specific prototypical disease entities are then presented within the context of these mechanisms and the molecular events that govern their induction and maintenance. The course is presented in lecture format, with the initial sessions consisting of examination of glass slides. The course should be ideal for students contemplating dissertation research projects and research mentors. (This course is not necessary for MSTP students.)

2. Pathology 582 Current Topics in Molecular Pathology (Fall, 2 credits)
This is a team taught course consisting of several modules, each concerned with a different topic in Pathology. Faculty members will lecture on very new developments within a field and assign recent papers. The students will present a critical analysis of the papers during an open discussion session. Topics include inflammation, DNA repair, fibrosis, cancer, aging, chemical biology and more. The course is designed to develop the oral presentation and critical thinking skills required for research.
3. Path 850 Research Colloquium in Experimental Pathology (Fall and Winter, 1 credit)
The Research Colloquium is a required course for the department’s graduate students during their pre-candidacy period. The Research Colloquium is offered both semesters and pre-candidates are required to register for two semesters. During this period the pre-candidate must provide a critique of four of the scheduled seminars per semester. The purpose of this requirement is to encourage students to think critically about what makes an effective research presentation, i.e. how to give a good talk.

Candidates participate in the seminar series by presenting one seminar per academic year on their thesis research projects. In addition, attendance and participation is mandatory for all candidates although they are not required to enroll in the course.

Besides students, this series features speakers from within the Department, lecturers from other academic units within the Medical School and the University, and invited outside speakers. Invited speakers for the 2012-2013 academic year included Ronald W. David, Ph.D. (Stanford School of Medicine), Lee Grimes, Ph.D. (Cincinnati Children's Hospital Medical Center), Wei Gu, Ph.D. (Columbia University), Charles W.M. Roberts, M.D., Ph.D. (Harvard Medical School), Robert W. Sobol, Ph.D. (University of Pittsburgh), Cheryl Arrowsmith, Ph.D. (University of Toronto), Hubert Yin, Ph.D. (University of Colorado at Boulder), Paul Kubes, Ph.D. (University of Calgary), Michael Gilmore, Ph.D. (Harvard Medical School, Massachusetts Eye and Ear Infirmary), Antonio Iavarone, M.D. (Columbia University), Utpal Davé, M.D. (Vanderbilt University Medical Center), and Neil Kelleher, Ph.D. (Northwestern University).

Members of the Pathology research community will be notified via email of current and future seminars. Individuals may be added to or deleted from the email list, and may request paper copies of seminar notifications for posting in their area, by contacting Laura Labut, laszczem@med.umich.edu

A complete schedule of seminars can be found on the Pathology website:
http://www.pathology.med.umich.edu/gradprogram/seminars/

4. Path 862 Translational Pathology (Fall, 1 credit)
Translational Pathology is a graduate-level course designed to meet the growing need for scientists and medical professionals who can bridge the gap between basic science and clinical practice. This multi-disciplinary course provides both graduate students and clinical residents/fellows with training in the methods and principles involved in translating basic science findings into clinically useful interventions to improve human disease outcomes. The central objective is to illustrate how basic science applied to human disease can lead to the discovery of its pathophysiology, which in turn can be used to develop therapeutics and diagnostic tests. The course is taught from the unique perspective of the pathologist, wherein faculty experienced with successful translational research offer insight spanning: the nature and manifestation of human disease, the basic mechanisms of disease pathogenesis, chemical pathology and drug discovery/development, laboratory diagnostics, clinical trials, personalized medicine, and finally the newest technologies used in these arenas. The target mixture of research and clinical trainees provides a further enrichment of the educational experience. This course will be offered once every two years. Students must have achieved candidacy in a biomedical science field prior to enrollment.
Focused Elective Coursework in Pathology

1. **Cancer Biology 553 Cancer Biology (Fall, 3 credits)**
   This course will cover a broad range of subjects relating to cancer biology. Emphasis is on the relationship between basic science and clinical aspects of cancer. Topics covered include carcinogenesis, cancer progression, tumor pathology, oncogenes, cellular growth control, tumor suppressor genes, oncogenic viruses, apoptosis, tumor immunology, clinical oncology, and therapeutics. The course consists of lectures by faculty in the Cancer Center who are experts on various topics.

2. **Pathology 551 Proteome Informatics (Fall, 3 credits)**
   This is a lecture course on proteomics and its biomedical applications. Proteomics – the study of the totality of the protein complement of an individual organism – is a very timely topic, both in basic science and in biomedical research and applications. This course begins with a thorough study of proteomics technology based on mass spectrometry (MS) technology, but will also touch upon alternative approaches. Informatics based methods of study are extremely important in this area and will be discussed in detail. Topics include: introduction to proteomics and mass spectrometry, peptide and protein identification, statistical methods and computational algorithms, post-translational modifications, genome annotation and alternative splicing, quantitative proteomics and differential protein expression analysis, protein-protein interaction networks and protein complexes, data mining and analysis of large-scale data sets, proteomics in cancer research, clinical applications, related technologies such as metabolomics and protein arrays, data integration and systems biology.

3. **Pharmacology 502 Introduction to Scientific Communication (Winter, 2 credits)**
   The purpose of this course is to introduce graduate students to essential scientific communication skills. Beginning with the relatively easy task of learning to search the literature over the internet and ending with the challenges of writing a NRSA grant application and giving a short seminar, each student will develop confidence in both written and spoken communication. Class meetings will alternate between presentations by local experts on various topics and student presentations of their work in progress. In depth analysis of student writing and presentation skills will be provided in class by the instructor, by other students working in small groups, as well as by guest scientists. Through a series of assignments, each student will write a grant over the course of the semester on a topic of his or her choice. By the end of the term each student will have polished and revised the proposal to a high quality product, which will be presented both orally and in written form to the rest of the class. Finally, each student will participate in a mock study section to constructively evaluate each other’s grants.

4. **Biological Chemistry 650 Mechanisms of Eukaryotic Gene Expression (Winter, 3 credits)**
   Topics will cover eukaryotic RNA polymerases, general transcriptional factors, mechanisms of transcriptional regulation mediated by protein and RNA, and chromatin structure and modifications remodeling. An emphasis will be placed on structural and mechanistic aspects of transcriptional regulation. The course will consist of a combination of lectures and participatory discussions of primary research literature. Prerequisites: Introductory biochemistry; introductory genetics or permission of instructor.
Pathology Guidelines for Preliminary Examination

Students should plan to take the preliminary examination at the end of the fall term of the second year of study. Any postponement of the preliminary examination will require approval by the Graduate Program Committee. The preliminary examination will consist of writing and defending an original research proposal. The purpose of the proposal is to demonstrate that the student has the ability to generate ideas for original research and to defend the methods and importance of the research.

Topics
The student should choose a topic in an area outside his/her dissertation research. However, the topic need not exclude the general field of the student's research but should use primary sources outside his/her specific dissertation topic. The research topic will ideally be complementary to the student’s thesis research, i.e., not directly related, but relevant enough that increased knowledge in the area will add value to their thesis research. The topic should not include any on-going projects currently taking place in their research mentor's lab, nor any projects that were written in a proposal by that lab.

To ensure sufficient originality and promote feasibility of the proposed studies, topics must be approved by the Graduate Examination Committee. To ensure the topic is distinct from the student's thesis work, the mentor must sign a form attesting that the topic fulfills the requirements.

Topic Approval
The one page Abstract/Specific Aims should first be written and approved by the Graduate Examination Committee before proceeding with the full proposal. The Committee must ensure that the topic is sufficiently distinct from the student's own research area to fulfill the criteria. If unacceptable, the committee will require the student to submit a new topic.

The one page abstract/ specific aims should include the following sections:

Title
The title should create a good first impression, to be informative of the proposed research topic, and to engage an interest.

1st Paragraph
- Introduce the project.
- Summarize the important knowledge.
- Identify the problem created by the gap in the knowledge and state the critical need.

2nd Paragraph
- State the overall project goal and ensure that addresses an identified gap in knowledge
- Present your central hypothesis (Be sure that you present a true hypothesis – one that can be objectively tested to determine its validity – rather than a predetermined conclusion)

3rd Paragraph
- Outline specific aims presented in a logical order
Ensure that specific aims correlate with the central hypothesis and support the overall project goal
Define a clear purpose, working hypothesis or statement of need, and expected outcome for each specific aim.
Make sure no specific aim is dependent on the successful outcome of another aim.

4th Paragraph
- Identify the project’s innovation, e.g., a unique approach or technology.
- Delineate the project’s expected outcomes: validation of the central hypothesis and resolving the gap in knowledge.
- Summarize the project’s significance

In addition to this one page abstract/specific aims, student should provide a paragraph with description of their current research and how the selected topic complements and differs from their thesis work and the work currently taking place in their mentor's lab.

An abstract should be submitted to the Graduate Examination Committee and should be approved before proceeding with the full proposal. The Chair of the Graduate Examination Committee will communicate and resolve with the student any concerns or differences of opinion about the topic, or to advise a student in focusing or choosing topic if needed. Note that typical reasons for rejecting a topic would include insufficient content involved in addressing the question, lack of feasibility, or lack of sufficient distinction from the student's dissertation research.

Written Proposal

Following approval the student should provide to all of the committee members the written proposal. The format should follow NIH R21 guidelines. The proposal should be 6 pages of text, including figures but excluding references, in Arial 11 point font, single spaced with margins of 0.5” to 1” on all sides. Here are the approximate page guidelines:

- Abstract/Specific Aims (1 page; already approved by the Graduate Examination Committee)
- Research Strategy (6 pages limit) organized in the following specified order:
  o Background and Significance (1-2 pages)
    ▪ Explain the importance of the problem that the proposed project addresses
    ▪ Explain how the proposed project will improve scientific knowledge, technical capability and/or clinical practice
  o Innovation (1/2 page):
    ▪ Describe novel theoretical concepts, approaches or methodologies to be developed or used and their advantages over existing
  o Approach (3-4 pages):
    ▪ Describe the overall strategy, methodology, and analyses to be used to accomplish the specific aims of the project
    ▪ Discuss potential problems, alternative strategies and benchmarks for success anticipated to achieve the aims
- Bibliography (no limit)
No preliminary data should be included in the application, but often diagrammatic figures can clarify the proposed research.

When preparing to write the proposal the student is encouraged to seek advice from a variety of sources, including the internet, library, and especially peers, post-doctoral fellows, and faculty members, including the advisor. The latter should be utilized to proof read the application and make suggestions to improve the proposal and their role should be non-directive. They should not take an active part in constructing the actual experimental design of the application. The student alone is responsible for independently choosing a scientific problem, designing a logical and convincing proposal. The work should represent the student's own creative thinking. When the application is complete the student will provide a copy of the proposal at least ten days prior to the oral examination. The written proposal will serve as a means to judge both the written aspect of the preliminary exam, as well as serve as the basis for the oral examination of the student. The students are permitted to speak to the individual committee members after handing out the preliminary proposal prior to the oral examination to address concerns and seek input.

**Mechanics of the Oral Examination**

During the oral examination, the student is expected to demonstrate a thorough understanding of the literature and methods relevant to the proposal. The oral examination will test the ability of the student to develop ideas and concepts pertinent to their area of study and to analytically respond to specific scientific questions. The examination will test the ability of the student to respond to questions concerning the hypothesis and the experimental design testing the hypothesis. While some of the questions may not have clear-cut answers, the Committee will evaluate the student's ability to reason effectively and draw appropriately on a broad range of knowledge to do so. The student should be familiar with historic experiments that resulted in the proposed hypothesis and basic scientific concepts related to the proposed research. For example, if the student has written an application on signal transduction, a fundamental knowledge on methods to assess signaling and the various biological signaling pathways should be well understood, even if the student proposes to study only a particular signaling pathway. The student should be familiar with the methodologies needed to execute the studies, including the theory, limitations, and appropriateness of the techniques.

At the beginning of the examination the committee members will confer in the absence of the student to briefly discuss the student's academic record and any potential problems that may need to be clarified. The student will start the exam by providing an overview, of not more than 20 minutes, on the written research topic. The student should briefly cover the hypothesis, the specific aims, and significance and then provide a more in depth discussion of the experimental approach of how the scientific problem will be approached, what are some potential expected results, and what are potential pitfalls. The committee members are free to question the student during the presentation to clarify a point. After the student presentation, the committee members will take turns asking questions relating to the written and/or oral presentation. This examination will likely take 2 hours. Upon completion of questioning, the committee will deliberate in the absence of the student and evaluate the student's performance.

The committee can decide to pass, pass with conditions (conditional pass), or fail the student. In the event of a conditional pass, the student will not advance to candidacy until the conditions stipulated by the Preliminary Exam Committee have been fully met to the satisfaction of said...
committee within a specified time frame. If the student fails the preliminary examination, the student shall be provided the opportunity of retaking the examination. The deadline for retaking the preliminary examination will be April 30th, the end of the second year of study. If the student fails the preliminary examination a second time, the student will not be permitted to continue in the Molecular and Cellular Pathology Graduate Program.

Upon the conclusion of the preliminary examination, the chair of the committee will write a summary of the student’s performance, which will be signed by all of the committee members. This form must be returned to the student services representative and placed in the student's file.

**Preliminary Exam Deadlines**

*A. Topic Selection and abstract- Due November 1st*
- Abstracts and topic will be reviewed by the preliminary committee. The abstract may be approved without revisions, approved pending revisions, or a new topic can be requested by the committee.

*B. Written Proposal- Due December 1st*
- Once the abstract and specific aims are approved a preliminary exam date is within the first two weeks of December, depending upon committee members’ schedule.

**To achieve candidacy a student must:**

- Complete 18 credit hours of graded coursework not including PATH 990
- Complete 4 credit hours of cognate coursework with a grade of B- or better
- Earn a minimum grade point average of 3.0
- Completed PATH 581 and 582 with a minimum grade of B. If the student joined the MCP after the 1st year and didn’t complete PATH 581 course, he/she will need to take this course after taking the candidacy exam in order to be eligible for the first meeting with their dissertation committee (within six months of achieving candidacy)
- Register for 2 terms of PATH 850
- Complete two of the following PIBS core courses (or approved alternatives): Biological Chemistry 550, Human Genetics 541 or CDB 530
- Successfully complete the preliminary exam

**Exceptions for MSTP students:**

- Because MSTP students are considered to be at the same academic level as students entering the program after one year in PIBS, MSTP students are not required to take the PIBS core courses and Path 581.
- MSTP students should plan to take their preliminary exams at the end of their first term as a pre-candidate. Any postponement of the preliminary examination will require approval by the Graduate Program Committee.
After a student achieves candidacy they must:

- Register for 8 credits of PATH 995 every fall and winter term until the oral defense.
- Form dissertation committee (by end of winter term, April 30th of the student’s second year) and submit the required Rackham form to Laura Labut for processing.
- Hold regular meetings with committee (at least once a year) and submit a thesis advisory committee meeting form to Laura Labut after each meeting. The student’s first meeting with the dissertation committee should occur by July 31st of their second year.
- Register for PATH 862 Translational Pathology which will be offered every second year.
- Attend and participate in the PATH 850 seminar. Registration is not required. Degree candidates participate in the seminar series by presenting one seminar per academic year on their thesis research projects.
- Complete and maintain the Individual Development Plan.
- Give one oral presentation at the Annual Pathology Research Symposium before graduation. If a student is not selected to give an oral presentation, they must present a poster at the Symposium each year.
- Make timely progress towards degree and give careful consideration to career goals (postdoctoral fellowships, jobs, etc.).
- Meet the Rackham requirements for the dissertation, defense and graduation.

Dissertation Committee

Upon achieving candidacy, students must form a dissertation committee. Formation of the committee must be completed by April 30th.

Guidelines for Dissertation Committee Service are available on the Rackham website under “Dissertation Information”. The student’s dissertation committee must have at least four members, three of whom are regular members of the graduate faculty, with two of whom are from the student’s home program. In addition, each committee much have a sole Chair or two Co-Chairs, and a Cognate member who is familiar with the standards for doctoral research and who holds at least a 0.50 appointment in a Rackham doctoral program other than the student’s home program. The dissertation committee Chair (or each Co-Chair) will guide and encourage the student’s design and execution of an original, high quality, doctoral-level research project. The end result of this effort is expected to be a dissertation which makes a substantive contribution to the student’s discipline, which is usually exemplified by journal publication. The Cognate’s role is to broaden the scholarly representation of the dissertation committee beyond the student’s home program and also serves to provide a non-specialist’s perspective on the quality of the dissertation.

Once the members of the committee have been determined the student must e-mail their names to Laura Labut, the Graduate Program Coordinator. Laura will initiate an electronic form to establish the committee with Rackham. The online system will send automated e-mails to the student, mentor and program chair soliciting their approval of the committee. Once all parties have approved the committee it will be posted to the student’s academic transcript.
The student’s first meeting with the dissertation committee should occur by the end of July of their second year. Students should prepare a written proposal to be distributed to their committee members before the meeting. The written proposal should follow the NIH formatting guidelines for F31 fellowships and be 2 – 6 pages in length.

After the first meeting, the student should hold yearly meetings to discuss progress towards the degree. A Thesis Advisory Committee Meeting form (available from Laura Labut or at the end of this handbook) should be submitted to the graduate office following each committee meeting for the student’s academic file.

**Responsibilities of the MCP Graduate Student**

Ph.D. students are responsible for fulfilling all of the academic requirements of the Molecular & Cellular Pathology Ph.D. program. Students are also responsible for:

- Completing and maintaining the Individual Development Plan.
- Ensuring that the Preliminary Exam is completed in a timely manner.
- Choosing a thesis mentor and dissertation committee in a timely manner and in accordance with program and Rackham policies. Should a student need to change thesis mentors, it is the responsibility of the student to identify a new thesis mentor.
- Scheduling yearly dissertation committee meetings and submitting a Thesis Advisory Committee Meeting form following each meeting.
- Making timely progress towards degree and giving careful consideration to career goals (postdoctoral fellowships, jobs, etc.).
- Meeting the Rackham requirements for the dissertation, defense and graduation.

*Graduate Student resources-

1. How to get the Mentoring you want: A Guide for Graduate Students at the University of Michigan

2. Rackham Graduate School Academic Policies -
   http://www.rackham.umich.edu/policies/academic_policies/

3. PIBS Curriculum Guide-
   http://medicine.umich.edu/medschool/sites/medicine.umich.edu.medschool/files/Curriculum%20Guide%202013_2.pdf

4. Gradtools
   http://www.gradtools.umich.edu
Responsibilities of the MCP Faculty

- Provide guidance and monitoring of the student's progress through the MCP Program in their laboratory. This includes regular meetings and review of the student's technical and scientific development, along with adherence to the dissertation project.
- Serve on committees as asked by the MCP program, such as preliminary exam committee, admissions committee, and/or graduate advisory committee.
- Ensure timely scheduling of preliminary exams, dissertation committee meetings, and dissertation defenses as well as provide written annual evaluations.
- Actively participate in weekly seminar series, participate in PIBS recruitment, and willingness to engage in graduate teaching activities.
- Should the mentor, for any reason, leave the University or resign as a student's mentor, it is their responsibility to identify what remains to be accomplished in the thesis project and the estimated time frame to completion. Identify the lab for the student to reside to finish experiments and/or write up the final thesis.

*Mentoring resources -

1. Howard Hughes Medical Institute and Burroughs Wellcome Fund - A Practical Guide to Developing Programs in Scientific Management


   http://www.nap.edu/readingroom/books/mentor/#committee

Department Events

The Pathology Research Symposium is held each fall. The half-day event is organized by the Pathology Graduate Students. The event is intended to showcase the breadth of research being conducted within the department by our faculty, postdoctoral fellows and students. The graduate students identify individuals to present their scientific research as well as select and invite an internationally-recognized Keynote Speaker. The Keynote Speaker for the 12th Annual Pathology Research Symposium on Thursday, November 21, 2013 is Lewis C. Cantley, Ph.D., Director, The Cancer Center at Weill Cornell Medical College and New York - Presbyterian Hospital.
Financial Support

Stipends

All Molecular and Cellular Pathology graduate students will be supported throughout the course of their studies. This support includes a stipend ($28,500 for the 2013-14 academic year), tuition and health care benefits. Students are supported financially in their first year by PIBS and by the Department of Pathology for the first half of their second year. Upon achieving candidacy, students are financially supported by their thesis mentor.

Stipends are considered taxable income. Students will receive their stipend through one of two different funding mechanisms. The amount of the stipend is the same for all students no matter which mechanism is being used for their payments. Most students will be funded by each of these mechanisms at different times during the course of their Ph.D. studies. The two funding mechanisms are 1) fellowship funding and 2) funding as Graduate Student Research Assistants (GSRAs).

**GSRA Funding:** Students who are not on fellowships are paid as Graduate Student Research Assistants (GSRAs). Students are generally paid through this mechanism at times when their source of funding is their mentor. GSRAs are considered “employees” of the University (without parking privileges). GSRAs will have taxes deducted from their paychecks, and they will receive a W-2 form. Social Security and Medicare will not be deducted during semesters in which students are enrolled; Social Security and Medicare will be deducted during terms of non-enrollment.

**Fellowship Funding:** Many students entering PIBS are paid from fellowships. Students on training grants and other types of scholarships such as the Rackham Merit Fellowships and NSF awards are also paid from fellowships. Students paid from fellowships do not have deductions taken out of their paychecks for federal taxes, state taxes, social security (FICA) or Medicare. Students are, however, required to report their stipends as income on their income tax returns, although they do not receive a W-2 form. Many students will need to pay quarterly income taxes. A presentation concerning this will be made by a university representative in the fall for incoming students, but for specific advice on a particular situation students would need to be advised from a private source because of UM regulations.

**Gradcare and Dental Insurance:** All graduate students, regardless of their funding source, are entitled to Gradcare health insurance. Students will receive an e-mail to their University account instructing them to log into Wolverine Access to make their benefit elections. **Students are responsible for submitting their benefit elections via Wolverine Access within 30 days of the day the e-mail is sent.** Currently, GSRAs default to GradCare and Dental Option I, single person coverage if no elections are made within the 30 day period.
**Fellowship Support:** Students are strongly encouraged to apply for individual fellowships. The following web pages are an excellent resource for funding opportunities:

Fellowships:  
[http://www.rackham.umich.edu/Fellowships/](http://www.rackham.umich.edu/Fellowships/)

External Funding:  
[http://orsp.umich.edu/funding/](http://orsp.umich.edu/funding/)  
[http://www.med.umich.edu/medschool/grants/grantfunding.htm](http://www.med.umich.edu/medschool/grants/grantfunding.htm)

**Scientific Meeting and Travel Assistance**

**Rackham Administered Travel Grants**

The Rackham Conference Travel Grant is intended to provide opportunities for Rackham graduate students to participate in meetings and conferences related to their academic professions. Graduate students are eligible to apply for a Rackham Conference Travel Grant award if:

- The graduate student is in good academic standing in a Rackham degree granting program  
- The student has responded to a formal call for abstracts  
- The student has been accepted to present a poster or paper at a conference

A student is eligible for one travel grant award (either domestic or international, but not both) during a fiscal year from July 1 – June 30.

To be considered for funding, a student must submit:

- A complete application via Rackham’s website including comments by his or her faculty advisor or graduate chair as to how the conference participation is directly relevant to the student’s research or graduate studies.  
- A copy of the confirmation of presentation or letter of invitation (an e-mail is also acceptable) with the applicant’s name clearly listed to verify the student’s acceptance to participate in the conference.  
- A budget regarding the amount of funding requested and a list of the specific expenses covered by the award.

The application is located at:  
[http://www.rackham.umich.edu/funding/from_rackham/student_application/rackham_conference_travel_grant/](http://www.rackham.umich.edu/funding/from_rackham/student_application/rackham_conference_travel_grant/)

**Application Deadline:** Applications are accepted at any time prior to the conference and will be considered on an individual basis according to each student’s circumstances. Applications WILL NOT be considered for retroactive funding.
The student will receive an e-mail notifying him or her of Rackham’s decision. 
NOTE: Please be aware that this award is considered taxable income. International students will have taxes withheld prior to receiving funds, so the actual award amount will be less than the amount indicated above. For students who qualify for need based financial aid, a Rackham conference Travel Grant may reduce the original amount of your loan. Please make a copy of your application before submitting it to Rackham, and one of the award letter, then contact the office of Financial Aid for help to ensure that the award does not affect your loans.

**Molecular & Cellular Pathology Administered Travel Grants**

The Molecular and Cellular Pathology Program Advisory Committee will consider any request from our graduate students for travel funds to attend scientific meetings.

Student should first apply for a Rackham Conference Travel Grant.

Students should then send an official request to the Program Committee (via Laura Labut) with specific information regarding the meeting (including dates, location, etc.), the title of his or her presentation (attach the abstract), other sources of funding, and how much he or she would need (itemized, e.g. plane fare, lodging, registration, etc.). This funding is supported by the Rackham Block Grant awarded to our program each academic year to assist us in providing direct student support for research related travel, recruitment activities, and summer support.

Please contact Dr. Nikolovska-Coleska or Laura Labut should you have any questions regarding this supplemental funding.

**Support for Recreation Facilities**

All students have access to campus recreation facilities during terms of enrollment. During terms of non-enrollment (generally spring and summer), students may request membership to the facilities. Campus recreational fees will be covered by the student’s mentor. To activate your Spring/Summer membership, please contact Laura Labut.

**Employment**

Molecular and Cellular Pathology Ph.D. students are forbidden from engaging in outside employment. Ph.D. training and research is a full time endeavor. Outside employment subtracts from the time and mental energy a student can devote to his or her research. Furthermore, it is an NIH policy that students who are supported by a PHS training grant may not be employed outside their training program.

**Student Vacation Policy**

Following the University's holiday schedule and NIH regulations, students will receive 2 weeks of vacation per year in addition to the designated holiday closures of the medical school. To arrange vacation time, all students must receive permission from their advisor. Students need to
contact the Program Coordinator, Laura Labut, if they will be on vacation for longer than 14 days. Approval is automatic as long as the mentor has given permission. The judgment and flexibility of the mentor can be exercised.

Circumstances such as family death, illness, or other crisis events will be considered on a case-by-case basis.
Professional Conduct and Development

Academic and Professional Integrity

It is the responsibility of each student to be informed about the rules of conduct and policies for academic and professional integrity. The Rackham Graduate School Statement on Graduate Academic and Professional Integrity is available online for your reference. The statement addresses issues such as:

- The Roles and Responsibilities of Graduate Students
- Forms of Academic and Professional Misconduct
- Descriptions of Academic Misconduct
- Procedures for Reporting and Investigating Allegations of Academic or Professional Misconduct by Graduate Students

http://www.rackham.umich.edu/policies/academic_policies/section10/

Authorship, Intellectual Property and Plagiarism

Resources

The University of Michigan Medical School Guidelines for the Responsible Conduct of Research website addresses the following issues:

- Responsibilities of a Mentor
- Data Collection and Management
- Rights and Responsibilities of Peer Review
- Guidelines for Authorship

http://www.med.umich.edu/medschool/research/

The University of Michigan Research web site details University, State and federal policies and responsibilities for research being carried out at the University. A full index of policies, including Intellectual Property, Conflict of Interest, Human Subjects, Radiation Safety and OSEH can be found at http://www.research.umich.edu/

Plagiarism is a serious breach of academic integrity. It is every graduate student’s responsibility to understand what plagiarism is and exert extreme care to avoid plagiarism in their work.

The University of Michigan Shapiro Science Library has the following resources available on these topics.
“Understanding Plagiarism and Academic Integrity” http://www.lib.umich.edu/shapiro-undergraduate-library/understanding-plagiarism-and-academic-integrity
Career Exploration, Planning and Placement

The Career Center offers services and resources to aid in the career exploration and job search of Ph.D. students in every academic discipline. Located on campus in the Student Activities Building, 515 E. Jefferson and on the web: http://careercenter.umich.edu/topic/services-graduatephd-students

Grievance Resolution and Procedures

These steps must be followed in the order in which they are presented. Every effort should be made to resolve the issue within the Pathology Department.

1. The student should attempt to resolve the grievance with the individual directly followed by consultation with their mentor.

2. If the problem continues and/or the mentor is the source of the grievance then the next step would be to contact the student representative (Laura Labut) who will help guide the student. This will likely result in a meeting with the Graduate Program Director.

3. The MCP Graduate Program Chair will attempt to reach a solution to the grievance working with the student and mentor as well as other parties involved. If no solution can be reached, the Chair will contact the Graduate Program Advisory Committee for further guidance.

4. The Advisory Committee can determine the course of action for remediating the grievance and resolve the situation to the satisfaction of the parties involved.

5. If the Grievance is not resolved the Department Chair’s office would be the final step prior to moving the issue outside of the Department.

6. If no resolution can be reached within the department the grievance should be taken to the PIBS graduate office where further consultation will be made prior to involving the Rackham Graduate School.

*Further steps can be identified from the University of Michigan Rackham Graduate School Policy located online at: http://www.rackham.umich.edu/policies/dispute_resolution/.
Department Organization and Procedures

Pathology Department Interim Chair

Kathleen Cho, M.D., Professor       kathcho@umich.edu
Assistant – Lynn McCain             lmccain@umich.edu
Phone: 763-6384                     M5240 MS1 / Box 5602

Pathology Graduate Program Chair

Zaneta Nikolovska-Coleska, Ph.D., Asst. Professor zanetan@umich.edu
Assistant – Laura Connor             lpryce@umich.edu
Phone: 764-6683                     4510 MSRB I / 5602

Student Service Administration

Laura Labut, Administrative Specialist Intermediate laszczem@umich.edu
Admissions, Curriculum, GSRA Appts, Gradcare
Phone: 763-6454                     4058B BSRB / 2200

Communications within the Department

E-mail Group

There is an e-mail group set up in MCommunity. The group is pathology.graduate.students@umich.edu. Members include current Pathology Graduate Students and 1st-year PIBS students who have identified Pathology as their program of primary interest. The owner is the Pathology Student Services Assistant. Graduate students may use this group for program related communications.

News and Events Notices

Faculty and students who have important news or events that they would like to share with the department may forward notices to Laura Labut for electronic or paper distribution. Important news and events may also be posted on the Pathology web pages; for submission, please contact Laura Labut laszczem@umich.edu. The Pathology web pages are a great resource for sharing accomplishments with the Pathology community, so please let us know of accomplishments, awards, and honors.

Department Web Page

http://www.pathology.med.umich.edu/
The Pathology Department home page includes links to the graduate program, faculty and student pages, telephone and paging directories, calendars of events, UMHS pages, maps, conference rooms, etc.

**Facilities**

**Copier and Fax**

The photocopier in the Pathology Education Office (M4211 MSI) is available for student use during normal office hours (7:30 am – 5:00 pm). The fax machine in the Education Office is available to students for sending and receiving documents. The fax number is (734) 763-6476. Students sending non-department related faxes that will incur long-distance charges should record the call on the fax log located above the fax machine. The student will be billed for the long-distance charge at a later time.

**Office and Building Keys**

To request office or building keys, contact Thad Schork, M5231 MSI, jtschork@umich.edu or 763-4913. You will be required to provide a copy of your lab safety training certificate from OSEH which can be printed online at http://www.oseh.umich.edu/training/mylic.shtml.

**Room Scheduling and Use**

The Pathology department has three conference rooms and one seminar room in Med Sci I that may be reserved for courses, seminars, conferences, meetings, lunches, etc. Many other rooms on the Medical Campus are reserved by Medical School Classroom Services – 936-2233. For assistance with reservations, contact Laura Labut, 763-6454.

**Academic Resources of Interest to the Department**

The Taubman Health Sciences Library is one of the largest medical libraries in the country. It serves the University of Michigan Health System as well as the Medical School, School of Nursing, and College of Pharmacy. There are library advisory committees designated by each school.

Taubman Health Sciences Library is located on the University of Michigan's medical campus at 1135 E. Catherine St., Ann Arbor, Michigan 48109-2038. To find the library, Directions and Maps are available online at http://www.lib.umich.edu/location/taubman-health-sciences-library/unit/140. Parking and bus information is also provided.

Contact Circulation at (734) 764-1210 and Reference at (734) 763-3071.
Faculty Profiles

Michael A. Bachman, Assistant Professor, M.D, Ph.D., University of Michigan, 2004. The effect of bacterial iron metabolism on innate immunity in the respiratory tract.

Stephen W. Chensue, Professor; Ph.D., Wayne State University, 1978, M.D., University of Michigan, 1983. Cytokine/chemokine regulation of chronic inflammation.

Arul M. Chinnaiyan, S.P. Hicks Professor and Director, Michigan Center for Translational Pathology, M.D., Ph.D., University of Michigan, 1999. Prostate and breast cancer, genomics, proteomics, metabolomics, and bioinformatics.

Kathleen R. Cho, Peter A. Ward Professor of Pathology and Interim Chair; M.D., Vanderbilt University, 1984. Molecular genetics of gynecological and other adult solid tumors.

Tomasz Cierpicki, Assistant Professor, Ph.D., University of Wroclaw, 2002. Structural biology, development of small molecules targeting protein-protein interactions, development of NMR techniques for drug discovery.

Yali Dou, Associate Professor, Ph.D., University of Rochester, 2000. The understanding of how chromatic-modifying enzymes regulate various cellular processes and how their misregulation leads to human disease.

Gregory R. Dressler, Professor, Ph.D., University of Pennsylvania, 1986. The molecular genetic basis of embryonic development. Cell signaling and transcription factors are studies in the developing mouse embryo using transgenic and biochemical approaches to understand how cellular differentiation and embryonic patterning is achieved.

Colin S. Duckett, Professor, Ph.D., University of London, England, 1993. Regulation of apoptosis; control of cell survival by the tumor necrosis factor and transforming growth factor beta receptor superfamilies.

Kojo S. J. Elenitoba-Johnson, Henry C. Bryant Professor and Director, Division of Translational Pathology, M.D., University of Lagos and Lagos University Teaching Hospital, 1988. Hematologic malignancies.

David O. Ferguson, Associate Professor, Ph.D., 1996, M.D., 1997, Cornell University Medical College. DNA repair and genomic stability in mammals.

Maria E. Figueroa, Assistant Professor, M.D., Universidad del Salvador, 1997. Epigenetic regulation during normal and malignant hematopoiesis, with particular interest in DNA methylation and DNA hydroxymethylation.

Jolanta Grembecka, Assistant Professor, Ph.D., 2000, Wroclaw University of Technology. Chemical biology approaches to develop small molecules for targeted therapies in cancer.

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Jay L. Hess, Carl V. Weller Professor of Pathology; M.D., Ph.D., Johns Hopkins University School of Medicine, 1989. Mechanisms of HOX gene regulation by the mixed lineage leukemia protein MLL, transcriptional deregulation by MLL fusion proteins, role of HOX genes in hematopoiesis and leukemia.

Celina G. Kleer, Harold A. Oberman Collegiate Professor of Pathology, M.D., University of Buenos Aires School of Medicine, 1993. Characterization of genes that drive highly aggressive breast cancer phenotypes and development of predictive and prognostic biomarkers.

Chandan Kumar, Assistant Professor, Ph.D., Indian Institute of Science, Bangalore, 1999. Integrative functional-genomics of cancers using high-throughput genome and transcriptome analyses to develop cancer biomarkers and personalized therapeutic options.

Steven L. Kunkel, Endowed Professor of Pathology Research and Rackham Graduate School Senior Associate Dean for Research, Ph.D., University of Kansas, 1978. Regulation of cytokine gene expression; macrophage pathobiology.

Elizabeth Lawlor, Associate Professor, M.D., McMaster University, 1989, Ph.D., University of British Columbia, 2002. Investigation of cellular and molecular origins of pediatric sarcomas and the role of stem cell pathway deregulation in tumor initiation and maintenance.

Andrew P. Lieberman, Associate Professor; M.D., Ph.D., University of Maryland, 1993. Mechanisms of neurodegeneration in Kennedy disease and Niemann-Pick type C disease.

Megan S. Lim, Professor and Director, Hematopathology, M.D., 1988, Ph.D., 1999, University of Calgary. Hematologic malignancies.

David B. Lombard, Assistant Professor, Ph.D., Massachusetts Institute of Technology, 2000, M.D., Harvard Medical School, 2001. Mammalian sirtuins in metabolism and aging; mechanisms of oxidative stress resistance

Nicholas W. Lukacs, Professor, Assistant Dean for Research Faculty, Associate Director of MICHRI, Ph.D., Wayne State, 1992. Asthma and pulmonary viral infections, cytokines, chemokines, T lymphocyte regulation in pulmonary disease eosinophil activation.

Richard A. Miller, Professor; Ph.D., 1976, M.D., 1977, Yale University. Aging and T-cell activation; genetics of aging.

Andrew G. Muntean, Assistant Professor, Ph.D., University of Chicago. Transcription factor deregulation in leukemia.

Alexey Nesvizhskii, Associate Professor, Ph.D., University of Washington, 2001. Functional and clinical proteomics, bioinformatics, computational analysis of biological datasets, mass spectrometry data analysis.
Zaneta Nikolovska-Coleska, Assistant Professor and Director, Molecular and Cellular Pathology Graduate Program, Ph.D., University Ss. Cyril and Methodius, Skopje, Republic of Macedonia, 1999. Discovery, design and development of small-molecules as new molecularly targeted therapies for cancer.

Gabriel Nuñez, Paul H. de Kruif Professor; M.D., University of Seville (Spain), 1977. Signaling pathways regulating innate immunity, the pathogenesis of inflammatory disease and cancer.


Jean Francois Rual, Assistant Professor, Ph.D., University of Notre Dame de la Paix, 2005. Characterization of the notch molecular network in glioblastoma and medulloblastoma.

Lloyd M. Stoolman, Professor and Director of Flow Cytometry; M.D., University of California - San Francisco, 1977. Study of lymphocyte recirculation and migration.

Scott Tomlins, Assistant Professor, Ph.D., 2007, M.D., 2009, University of Michigan. Genitourinary Pathology.

Sooryanarana Varambally, Associate Professor, Ph.D., Indian Institute of Science, Bangalore, 1997. Studies on cancer-associated proteins, specifically the polycomb group of proteins.

James Varani, Professor; Ph.D., University of North Dakota, 1974. Skin biology, skin atrophy, fibrosis, extracellular matrix, metalloproteinase, epithelial cell differentiation.

Peter A. Ward, Godfrey D. Stobbe Professor, M.D., University of Michigan, 1960. Immunology, inflammation, oxygen radicals, leukocytes, cytokines, complement activation products, and regulatory interleukins.

Thomas E. Wilson, Associate Professor; M.D., Ph.D., 1994, Washington University. Mutagenesis, DNA repair, chromosomal dynamics. Study of the normal functions of DNA double-strand break (DSB) repair pathways and the origins of chromosomal rearrangements associated with cancer, specifically translocations, deletions, and amplifications.

Anuska V. Zochowska, Associate Professor, M.D., University of Nis Medical School, 1990, Ph.D., University of Belgrade Medical School, 1999. Molecular basis of inflammatory events at the blood brain barrier; the role of vascular endothelium in the pathogenesis of central nervous system inflammation; molecular mechanisms.
Appendices
GRADUATE PROGRAM IN MOLECULAR & CELLULAR PATHOLOGY

STUDENT: ______________________________

I have reviewed the proposed preliminary exam topic for (enter student's name here) and confirm that there are no on-going projects currently taking place in my lab, nor any proposed projects, that match the student's candidacy exam proposal.

COMMENTS:

SIGNED:

___________________________________
Student's mentor
THESIS ADVISORY COMMITTEE MEETING REPORT FORM

Student: ______________________
Mentor: ______________________
Date of this Committee Meeting: ________________
Date of Last Committee Meeting: ________________

Committee Members: ____________________ Present at this meeting? Yes No
Committee Members: ____________________ Present at this meeting? Yes No
Committee Members: ____________________ Present at this meeting? Yes No
Committee Members: ____________________ Present at this meeting? Yes No
Committee Members: ____________________ Present at this meeting? Yes No

1. Did the Committee approve of the progress made since the last Committee meeting? If there were suggestions by the committee, will any of them be difficult or impossible for the student to achieve?

2. Were their suggestions for additional course work for the student? If yes, what are the suggested courses?

3. Were there any questions about the student’s background knowledge?

4. Were there any questions about the student’s oral presentation skills?
5. Did the Committee feel the student’s progress in all of the above areas was sufficient?

6. Did the Committee discuss the student's career goals and action plan?

7. Any other comments?

_______________________________________________________

Mentor Signature

_______________________________________________________

Date

1 Form revised July 2013