



Department of Pathology

University of Pittsburgh School of Medicine

Transforming the Present – Discovering the Future

Student Handbook

Guidelines and Regulations for Graduate Study in the Cellular and Molecular Pathology Program

The Student Handbook is not intended to be a complete statement of all University, or Department of Pathology, policies, procedures and academic regulations. Information contained in the Handbook is subject to change at any time, with or without notice. The Handbook does not represent a contract between the University of Pittsburgh and its students. The information contained herein supersedes that published in previous Handbooks.



2024 – 2025

Updated 11/1/2024

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Department of Pathology home page: <https://www.path.pitt.edu>

Office of the Learning Environment: <https://www.ole.pitt.edu>

Office of the Provost: <https://www.provost.pitt.edu>

AAMC compact between students and mentors: <https://www.aamc.org/what-we-do/mission-areas/medical-research/grad-compact>

Office of Graduate Studies: <https://somgrad.pitt.edu>; contact: 412-648-8957 or somgrad@pitt.edu

Office of Academic and Career Development: <https://www.oacd.health.pitt.edu>

Pitt post-doctoral positions: <https://postdocjobs.pitt.edu>

University of Pittsburgh Health Sciences home page: <https://www.health.pitt.edu>

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1. OVERALL OBJECTIVES AND GUIDELINES

The graduate training program in Cellular and Molecular Pathology at the University of Pittsburgh has been designed to accomplish several objectives:

- Development of trainees into independent biomedical research scientists.
- To develop competence in conducting laboratory research; to plan, execute, report, and defend an original piece of research.
- To develop general competence in core Pathology disciplines (and specific expertise in one or more areas of Pathology, such as neuropathology, liver pathology, lung development and disease, cancer biology, regenerative medicine, translational medicine and/or immunopathology.
- To develop a general professional competence in oral and written expression, including the critical analysis of primary scientific articles, seminar presentation skills, grantsmanship, and teaching.

In formulating the graduate training program, the faculty has been guided by several principles. First, the Cellular and Molecular Pathology (CMP) Graduate Training Faculty and each student's Major Advisor/mentor should aid each student in the development of an individualized training program based on the student's background and interests. Second, research experience should form the core of each student's training and as such, should not be postponed by a lengthy period of time devoted to coursework that is not inherently valuable to training the student as a competent biomedical scientist. Third, students should be evaluated in terms of those competencies that are important to an independent research scientist: designing, conducting and evaluating research, both their own and that of others. It is anticipated that students should be able to complete the program after entering CMP in approximately three to four years. Thus, the progress that a student makes in the program is considered primarily in terms of the student's performance as an investigator.

1) Students are expected to attend all classes in which they are enrolled, get to them on time, and notify the instructor(s) when there is a scheduling conflict; appropriate steps should be taken to minimize potential outside commitments as more than two unexcused absences in a semester may result in a grading penalty.

2) In accordance with University guidelines, the laboratory hours required are those necessary to make satisfactory progress toward completing the degree, taking into account the time necessary for the student to complete degree coursework when applicable. With mentor approval, senior students are allowed to be engaged in outside activities related to their professional growth such as externships, although it is expected that the student will typically work no more than an average of 10 hours per week towards this goal.

3) In order to safeguard their mental and physical health, students should not be expected to engage in research 7 days a week or on University holidays in which the University is closed. Further, in addition to University holidays in which the University is closed, students with 12-month appointments must be allotted at least 10 additional days per calendar year as breaks from their research to provide students with time away from academic training. Although negotiations are left between the student and their advisor with regards to actual time off, the program director must be notified of any anticipated leave of absence that is greater than 2 concurrent weeks in a given year, for the purpose of obtaining pre-approval status. For international students, it is strongly recommended that they do not leave the country for visits home until all required coursework has been finished and the comprehensive exam has been passed as potential visa issues may be encountered that interfere with returns.

4) Parental accommodation guidelines can be found here:

<https://www.gradstudies.pitt.edu/student-life/resources-pregnant-and-parenting-students/graduate-students-and-parental-leave>

5) Attendance at scientific meetings is important for student growth; mentors should encourage and help fund attendance at 1 or 2 meetings/year.

While the program does not currently have a formal policy about publishing before graduation, students should aim for approximately 1 to 3 publications, with at least 1 as first author, and should make a point of interacting with other scientists in their field to earn co-authorship status on their colleague's publications. Further, bear in mind that some journals are considered "better" than others, and it may be favorable to have 1 publication in a high-impact journal instead of multiple papers in low-impact journals when looking for a position after graduation.

2. PURPOSE OF THIS DOCUMENT

This document supplements the ***Regulations Governing Graduate Study at the University of Pittsburgh*** and thereby provide a complete handbook for students concerning the Program's rules, expectations, and recommendations for each aspect of the CMP graduate program. <https://catalog.upp.pitt.edu/index.php>

Questions regarding specific issues of the graduate program should be directed to Dr. Wendy Mars, Professor of Pathology and Director of the Cellular and Molecular Pathology Graduate Training Program. ***Note that the CMP program, while closely affiliated and interactive with select educational components of the Pathology Department, is in fact, a stand-alone educational training program within the University of Pittsburgh School of Medicine (UPSOM).***

2.1 Changes to the Guidelines

Each graduate student should print a copy of the Student Handbook when they enter the program. To ensure that students are given an up-to-date version of the Handbook, a new edition of the Handbook will be dated and posted on the internet at the beginning of each fall term. The Director will oversee the editing of the Handbook following solicitation of student and faculty input. It is expected that this annual revision of the Handbook will not result in any substantive change in the graduate program. Rather, this process is expected to update or clarify aspects of the previous edition. Major substantive alterations in the Handbook (e.g., a change in the format of the Comprehensive Examination) and the program require additional discussion by the faculty and students and final approval by a majority of the CMP faculty.

During their progress through the Program, each student should refer to the Handbook for general guidance and questions.

3. ADVISORS

To aid the student in attaining the objectives outlined in this document, the faculty has created separate mechanisms for providing academic and research advice. Upon entering the Program, each student will select a Major Advisor/Mentor. The Major Advisor is the faculty head of the laboratory where the student will perform his/her thesis dissertation. It is expected that the Major Advisor will also serve as a general advisor to the student (see below). Further advice regarding research projects is the function of the PhD Dissertation Committee. At all stages of their graduate training, each student must have a Major Advisor and, upon completion of their Comprehensive exam, an active Dissertation committee must be formed within 6 months. Advice on academic issues and other issues relating to graduate education will be handled formally by the Program Director (i.e the Academic Advisor), with meetings regularly scheduled prior to each academic term.

3.1 Directors of the CMP Graduate Training Program

The Director of the CMP Graduate Training Program (hereafter referred to as Director) has the primary responsibility for ensuring the graduate program is running effectively. Students who have questions related to required coursework, curriculum development, or completion of Program milestones should consult with the Director. The Director is responsible for approving student registration forms, approving the composition of student evaluation committees, (i.e., Comprehensive Examination, Thesis, and Dissertation Defense committees), and may, at his/her discretion, approve minor modifications in the Program's academic requirements for students on an individual basis.

The Associate Director has full capacity to act in place of the Director when the Director is unavailable.

The Associate Director for CMP Curriculum is responsible for working with the Director and Associate Director to assure direct oversight of the curriculum content including, but not limited to, establishing overall requirements, evaluation of course content, and evaluation of the teaching by educators.

Administrative staff member(s) from the Department of Pathology will assist the Directors. The Graduate Coordinator (Amanda Bytzura, amb430@pitt.edu) is responsible for maintaining student files, notifying students of upcoming deadlines, assisting students with scheduling exams and committee meetings and monitoring the status of students. The Pathology Payroll Coordinator (Carolyn Nolte, noltecr@upm.edu) assists with fiscal issues related to insurance and stipends.

The CMP Executive Committee consists of the Directors, the CMP faculty representatives on the IBGP admissions committee, the CMP Summer Undergraduate Research Program Director(s), and the Pathology Investigator Residency/Research Program Director(s). The executive committee is charged with reviewing requests of Pitt graduate faculty who wish to cross-affiliate with CMP (decisions final, based upon majority opinion) and to pre-approve requested changes to the structure of CMP, with final approval based upon a majority vote by CMP members.

3.2 Major Advisor/Mentor

At all times during their graduate training, students will be engaged in laboratory research. While a student is working in a faculty member's laboratory, that faculty member will serve as the student's Major Advisor. Major Advisors are limited to CMP Graduate Training Program faculty members.

Students and the Major Advisors should discuss the nature of their interactions prior to a student entering the lab so that each has a full understanding of what they should and should not expect from one another, using the AAMC compact as a guideline (<https://www.aamc.org/what-we-do/mission-areas/medical-research/grad-compact>). This compact is part of the transfer agreement letter and should be read and discussed carefully, prior to a student signing on to a lab. Students should understand that different faculty members have different styles of interacting with students and matching mentoring styles is key to ongoing success. New students are encouraged to consult with more senior students to obtain student perspectives concerning the mentoring styles of different faculty members.

4. CMP GRADUATE PROGRAM

The following sections outline the academic courses, the research experiences, and the oral and written examinations (herein referred to as “milestones”) that the student must successfully complete prior to being awarded a doctoral degree. Students can affiliate with CMP via the Interdisciplinary Biomedical Graduate Program (IBGP) or the MD/PhD program (MSTP) in the School of Medicine. A calendar listing the deadlines associated with these milestones is included in section 11. These requirements are described in terms of the academic and research accomplishments expected during each year of the student's progress through the Program. The Director must approve deviations from the outlined sequence and time schedule. Further, when students transfer into CMP from another graduate program, the Director determines whether courses taken in the other graduate program fulfill the various CMP requirements as outlined below.

4.1 Interdisciplinary Students and Curriculum

Students are admitted to a variety of PhD degree-granting programs through the Interdisciplinary Biomedical Graduate Program (IBGP). The first year of study is a focused interdisciplinary core program that covers the basic knowledge and skills necessary for research in all areas of biomedical sciences. After successfully completing the first year, students choose one of four specialized degree-granting programs for their advanced courses and dissertation work. Therefore, students enter the CMP Graduate Program only after completing the first-year requirements of the Interdisciplinary Biomedical Graduate Program.

4.1.a IBGP Students -- First Year

The IBGP curriculum emphasizes research experience and practical skills from the first day. The approach is flexible and accommodates students whose research interests are still evolving by introducing them to a variety of fields through interdisciplinary courses and laboratory experiences. For those students who have a clearly defined research interest, the program offers the opportunity to move quickly into a dissertation project and accelerate their study.

The first year generally includes three, 10-12-week research rotations with graduate faculty selected by the students in an effort to match their research interests. These research rotations provide an opportunity for students to experience individual laboratory environments, including techniques being used in the laboratory, as well as the research questions being addressed. Further, the experiences help students make an informed choice in selecting their dissertation mentor. A first-year faculty mentor assigned to the student aids them in the selection of research rotations. A list of current rotation projects available to students can be found at the following web site: <https://www.gradbiomed.pitt.edu/current-students/lab-rotations>. However, not all faculty elect to list their projects, and the website is not always current, so it is important to work with your first-year mentor to find a suitable rotation.

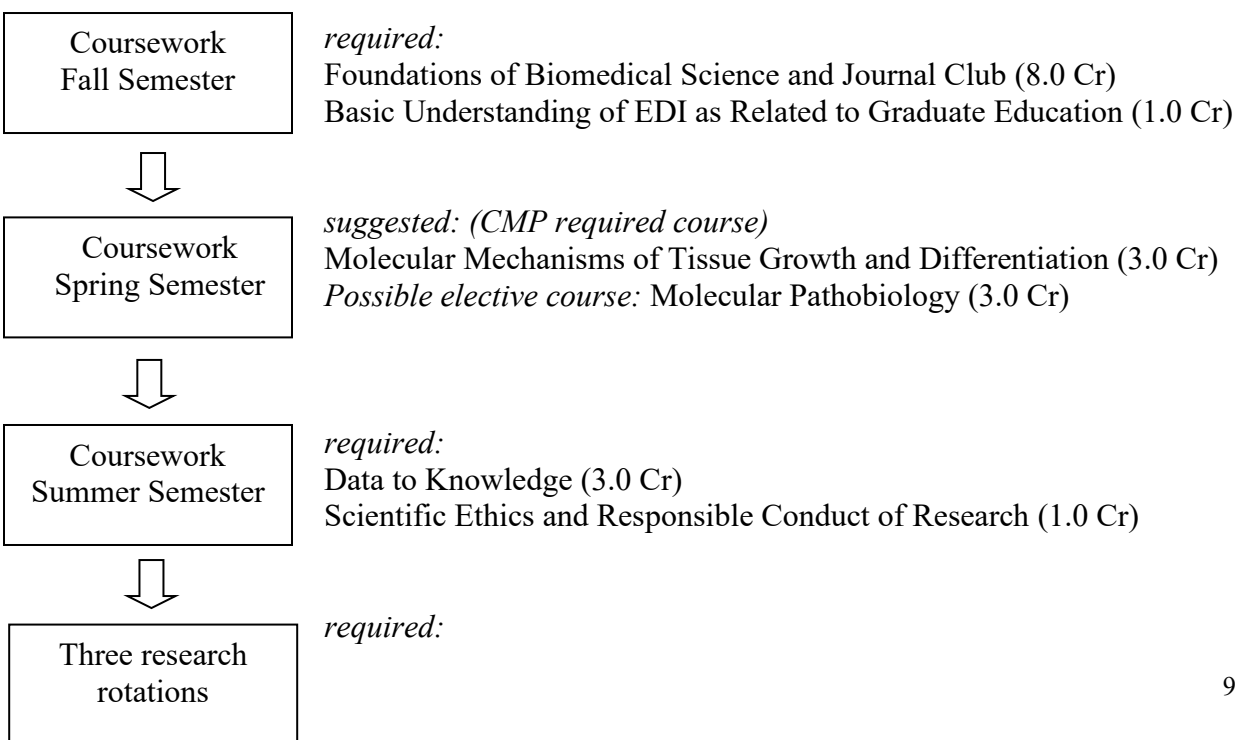
Foundations of Biomedical Science and Foundations Journal Club (INTBP 3000 and INTBP 3005) are two core courses taken in the fall by all students entering the IBGP. These courses are designed to convey knowledge of the molecular mechanisms controlling cell and tissue function and to develop an understanding of the experimental evidence supporting these concepts. The conceptual breadth of modern biomedical science is covered through a longitudinally integrated presentation of material drawn from biochemistry, cell biology, genetics, immunology, microbiology, neurobiology, pathology, pharmacology and physiology. The development of critical thinking skills is emphasized through an evaluation of experimental evidence and reading of the primary literature. Contemporary approaches to problem solving in biology as well as principles underlying modern methods of biomedical research are integrated through the analysis of mechanisms underlying biological phenomena.

Basic Understanding of EDI as Related to Graduate Education (MSCMP 2280)

This fall course covers several topics including how to successfully choose a mentor, professional communication, and most importantly, training related to a full understanding of Title IX and DEI at the University.

In the spring, students take specialized courses in areas of interest such as signaling, pathobiology, or immunology.

IBGP First Year Coursework for CMP:



A minimum of three research rotations (1.0 Cr each) must be completed during the fall, spring and summer semesters.

During the summer term, all students must complete a course covering Biostatistics as related to Research (INTBP 2013, 3.0 Cr), take a course on Scientific Ethics (INTBP 2290, 1.0 Cr), and **in the subsequent fall, all CMP students are also required to take a course on Grant Writing (INTBP 3240, 2.0 Cr)**. At the end of the first year, the IBGP Steering Committee completes a Preliminary Evaluation of each student's performance. Upon successful completion of the above requirements (except grant writing) and the Preliminary Evaluation, the student is admitted into the second year of graduate school. The student can then officially join a laboratory and a graduate training program such as CMP. Students must file transfer forms (from the IBGP to CMP), which are available from the IBGP Graduate Office. The student, Major Advisor/Mentor, Director of the CMP Graduate Training Program and the graduate office, must all sign this form. Additionally, either the Department Chair, Division Director, or Institute Director must sign that they fiscally guarantee that the mentor has sufficient funding to support the student and will step in should the mentor develop financial difficulties.

Once the student has joined the IBGP-CMP program they will be required to submit yearly 1-page progress reports, an updated Biosketch, and an updated CV (by June 30) and to present their research at the BGSA Symposium (Fall) and the Departmental Retreat (late May/early June).

4.1.b. IBGP Students -- Second Year

Students will continue with coursework, which includes required and elective courses (typically one or two classes in both the Fall and Spring terms), as well as Research Seminar (MSCMP 2750, Fall term and Spring term, 1.0 Cr/semester, 5-semester minimum requirement). Students typically complete most required coursework by the end of the second year. All students are required to complete Molecular Mechanisms of Tissue Growth & Differentiation (MSCMP 2730, 3.0 Cr) by the end of year 2. It is advised that students complete this course during their first year of graduate school, while still an IBGP student. Students must also complete one of the following three "hard elective" courses: Molecular Pathobiology (MSCMP 2740, 3.0 Cr, Spring only) *or* Cancer Biology and Therapeutics (MSCMP 3710, 3.0 Cr, Fall only) *or* Personalized Medicine (MSCMP 3790, 3.0 Cr, Fall only). The former two offer training related to Anatomical Pathology research whereas the latter represents training related to research in Laboratory Medicine. A minimum of two "soft" elective courses, optimally related to the student's research project, is also required. Active CMP elective courses include Intro to Tissue Engineering (MSCMP 2760, 3.0 Cr, Spring only), Biomaterials and Biocompatibility (MSCMP 2770, 3.0 Cr, Spring only), ECM in Tissue Biology (MSCMP 3735, 3.0 Cr, Spring only), Stem Cells (MSCMP 3740, 3.0 Cr, Spring only), Angiogenesis (MSCMP 3750, 3.0 Cr, Spring only), and Cell Therapy (MSCMP 3770, 3.0 Cr, Spring only); however students may elect to take electives sponsored by other Health Science graduate programs if they are pertinent to the student's research. The University of Pittsburgh requires at least 32 credit hours of coursework to obtain a PhD degree.

As noted above, all CMP graduate students are required to enroll in the Pathology Research Seminar each term or a substitute approved by the program director for a minimum of 5 terms, though they may be excused from this seminar series during the term in which they will defend their thesis. Students are also expected to attend the monthly Research in Progress series (last Monday of the month) where 1-2 students present their research to the other students.

Before the end of the fall term of the third year following matriculation, each student must pass the Comprehensive Examination (see section 10.2). The members of the Dissertation Committee should be finalized after successful completion of the Comprehensive Examination. Students can then submit the Application for Admission to Candidacy form (Please refer to section to Milestone Forms in Section 12 to preview these forms). Students are expected to enter Dissertation within six months after passing their Comprehensive exam. **Both the Comprehensive and Dissertation committees must be approved by the program director.** Descriptions of the comprehensive and oral exams can be found in sections 10.2 and 10.3, respectively. **The Director has one-page guidelines prepared regarding both the exam process and entering dissertation available for students and faculty upon request.**

****Note: Students must notify the administrative coordinator prior to ALL scheduled meetings so she can prepare the appropriate paperwork. Also, be aware that the administrative coordinator is available to assist in making room reservations for the meetings.**

4.1.c. IBGP Students -- Third Year and Subsequent Years

Students will focus on dissertation research and course electives during the third and subsequent years. **Each student must meet with their thesis committee a minimum of every six months** to discuss their progress to date. After entering dissertation, students must accumulate at least 40 credit hours of PhD Dissertation Research to fulfill the University requirement. These credit hours cannot be accrued until the student completes the Comprehensive Examination and enters into Dissertation including submission of the Application for Admission to Candidacy milestone form (Please refer to section to Milestone Forms in Section 12 to preview these forms).

4.1.d IBGP Students -- Completion

Students will be awarded a degree after successfully defending their thesis and fulfilling all University requirements for the PhD. Important steps for graduation are outlined in section 10.4.

4.2 MSTP (MD/PhD) Students entering the CMP Program

The overall University and Cellular and Molecular Pathology (CMP) program requirements for obtaining a PhD, as described in this manual, are similar for MD/PhD students except the only required course is Tissue Growth and Differentiation (plus three electives and Path Research Seminar). MD/PhD students first transfer into the IBGP and then immediately transfer into CMP.

4.2.a. MSTP Students -- Coursework

All CMP graduate students are required to enroll in the Pathology Research Seminar (MSCMP 2750) for a minimum of five terms, although students may be excused from this seminar series during the term in which they will defend their thesis. Additional coursework is typically completed during the first 1.5 years after MD/PhD students enter the CMP graduate program, thereby maximizing the time students can focus on their PhD dissertation research. Students entering the CMP program are required to take MSCMP 2730 (Molecular Mechanisms of Tissue Growth & Differentiation, 3.0 Cr, Spring only), as well as three electives of their choice. CMP elective courses include Molecular Pathobiology (MSCMP 2740, 3.0 Cr, Spring only), Cancer Biology and Therapeutics (MSCMP 3710, 3.0 Cr, Fall only), Intro to Tissue Engineering (MSCMP 2760, 3.0 Cr, Spring only), Biomaterials and Biocompatibility (MSCMP 2770, 3.0 Cr, Spring only), ECM in Tissue Biology (MSCMP 3735, 3.0 Cr, Fall only), Stem Cells (MSCMP 3740, 3.0

Cr, Spring only), Angiogenesis (MSCMP 3750, 3.0 Cr, Spring only), Cell Therapy (MSCMP 3770, 3.0 Cr, Spring only) or Basics of Personalized Medicine (MSCMP 3790, 3.0 Cr, Fall only); however, students may elect to take electives sponsored by other Health Science graduate programs as related to their thesis work. A typical curriculum might be as follows:

YEAR 1 IN CMP GRADUATE PROGRAM

FALL TERM

Course number and Title	Credits
MSCMP 2750 Research Seminar	1 Cr
INTBP 3240 Grant Writing	2 Cr
Elective	3 Cr

SPRING TERM

Course number and Title	Credits
MSCMP 2730 Molecular Mechanisms of Tissue Growth & Differentiation	3 Cr
MSCMP 2750 Research Seminar	1 Cr
Elective	3 Cr

FALL, SPRING or SUMMER TERMS

Course number and Title	Credits
Elective	3 Cr

YEARS 2 and 3 IN CMP GRADUATE PROGRAM

FALL AND SPRING TERMS

Course number and Title	Credits
MSCMP 2750 Research Seminar	1 Cr
MSCMP 2750 Research Seminar	1 Cr
MSCMP 2750 Research Seminar	1 Cr

4.2. b.MSTP Students -- Comprehensive Examination

All MD/PhD students in the CMP graduate training program are required to complete their comprehensive examination by the end of the second Fall term in the CMP program. Shortly after completing the Comprehensive Examination (before Spring term drop/add ends), students should have a second committee meeting and submit the Application for Admission to Candidacy form. This ensures that students can obtain PhD Dissertation Credit Hours beginning the Spring term of the second year. The University requires that PhD students accumulate at least 40 Credit hours of PhD Dissertation Research, which requires a minimum of 1.5 years to complete. Therefore, MD/PhD students rapidly progress through this important program milestone. A full description of the Comprehensive examination is described in section 10.2 of this handbook. **The Director has one-page guidelines prepared regarding both the exam process and entering dissertation available for students and faculty upon request.**

4.2. c. MSTP Students -- PhD Dissertation Committee

Typically, the faculty participants in the PhD Dissertation Committee are the same as in the Comprehensive exam committee. This permits the Dissertation Committee to quickly contribute to the experimental design of the thesis project. All CMP students are required to meet with their PhD Dissertation Committee at least twice per year. An evaluation form is available from the Graduate Coordinator and must be returned to the Graduate Coordinator after each committee

meeting. Additional information regarding the PhD Dissertation Committee can be obtained in section 10.3 of this handbook.

4.2. d.MSTP Students -- Subsequent Years and Completion

Students focus on dissertation research and are **required to meet with their thesis committee every six months to discuss progress** and future plans. A student is awarded a degree upon successfully writing and defending his/her thesis. Important steps for graduation are outlined in section 10.4.

5. COMPONENTS OF THE PLAN OF STUDY FOR ALL CMP STUDENTS

In developing a plan of study, students are expected to strike a balance between breadth in pathology and depth in their area of specialization. Students are encouraged to be innovative in designing their graduate training experience. Thus, courses are defined as any accredited interaction between a student and one or more faculty members, such as the Special Topics course. This includes formal lecture courses (usually but not always at the graduate level), seminars, or tutorials at the University of Pittsburgh, CMU, or at other universities, research institutes, or special study programs. Additional components include the Pathology Research seminar, formulation of a thesis committee and bi-annual reports to this committee, and completion of all student milestones.

5.1 Core Curriculum in Pathology

The core curriculum consists of one required course that should be completed within the first two years of entering the program. This core course, Molecular Mechanisms of Tissue Growth & Differentiation (MSCMP 2730), is an absolute requirement for all and deals with issues of cellular and molecular biology related to normal tissue growth and differentiation. IBGP students are also required to complete one of three other specific courses (hard electives) dealing with basics related to Pathology: Cancer Biology and Therapeutics (MSCMP 3710), Molecular Pathobiology (MSCMP 2740), or Basics of Personalized Medicine (MSCMP 3790). The former two represent the anatomic side of Pathology training whereas the latter course represents the Laboratory Medicine side. Additionally, students entering from IBGP must take a minimum of two more electives of their choice, whereas MSTP students must take a minimum of three electives of their choice in addition to the one required course.

5.2 Electives and Tutorials

The elective courses are meant to further a student's expertise in pathology and assure they have fulfilled the University requirement of 32 credit hours of coursework. Students may also establish tutorials in specialized areas for which formal courses are not available. In such cases, a student (or group of students) identifies a faculty member willing to serve as a tutor and develops a syllabus, including a mechanism by which competency in the area will be assessed. The Director should approve the syllabus, in advance of the beginning of the tutorial. The tutorials are then offered as a Special Topics (MSCMP 2780) class for the appropriate credit hours. The subject matter of these tutorials usually will be "academic" in nature; i.e., with a focus on the reading of primary and secondary literature. It also may involve learning new laboratory techniques.

5.3 Research Seminar

Incoming students are required to attend the Pathology Research Seminar during each Fall and Spring term (MSCMP 2750). Students are required to participate in this course for at least five terms. After five terms, students may participate in another seminar series in which they have an opportunity to present research data, providing they have adequately demonstrated proficiency in oral presentation skills. If the student fails to reach these objectives, then he/she must continue in the weekly Research Seminar. **Senior students are informally invited to attend this course to assist in the development of more junior students.** Students are not required to take this course in the term in which they will defend their thesis. If a student has a conflict with their assigned presentation time, they should contact the Course Director to be reassigned another date/time.

Students are required to present a paper approximately once each term, and it is expected that in the fall, the more senior students will make their presentations earlier in the term whereas the more junior students will make their presentations later in the term. The presentations will be critiqued by fellow students and the faculty supervisors. Presentations that are not considered acceptable by the faculty supervisors must be repeated. In addition to presenting a paper once during the term, each student is required to read the selected paper each week and be prepared to discuss it. The faculty view active participation in this course as an essential component of the CMP Graduate Training Program.

5.4 Departmental Seminar Series

Each student is encouraged to attend the Department of Pathology research seminars on a regular basis. The seminars typically occur at noon on Wednesdays and are presented by invited speakers discussing the latest advancements in multiple fields related to the study of human disease.

5.5 Statistical Analysis

All students are required to successfully complete a course on biostatistics. Students entering the program via the general program, IBGP, will enroll in this course during the summer term following the first year of graduate school (Data to Knowledge, INTBP 2013). Students entering the CMP program via the MD/PhD program will complete a comparable statistics course as part of their MSTP requirements.

5.6 Professional Ethics, EDI training and Practices

All students are expected to show ethically appropriate behavior with regard to the conduct of their research and mastery of safe laboratory practices. These competencies extend to the treatment of laboratory animals, publication of data, and the use of references to previous literature. Further, all documents submitted to satisfy curriculum or research requirements of the program should be free of plagiarism and conform to the rules defined in the University of Pittsburgh Academic Integrity Guidelines (<https://www.provost.pitt.edu/faculty/academic-integrity-freedom/academic-integrity-guidelines>). As part of their orientation to the University upon first entering the program, all students must attend training sessions in Radiation Safety, Laboratory and Formaldehyde Safety, and Library usage. All students should also familiarize themselves with the NIH “Guide for the Care and Use of Laboratory Animals” (2011), the “The Animal Research Online (ARO) User’s Guide” (from the IACUC office) and “Guidelines for Responsible Conduct of Research” (from the IRB, May 2011)

All IBGP students are required to complete a formal training program on research ethics during their first year in the program. This requirement will be fulfilled by taking a 1-credit course in Equity, Diversity and Inclusion (MSCMP 2280) in the fall term and Scientific Ethics (INTBGP 2290) during the summer term. MD/PhD students take comparable courses through the MSTP program.

5.7 Grant Writing Skills

All CMP students will be exposed to a formal course in grant writing before completing their thesis. Exposure to this component of the program is dependent upon how they enter the program. For IBGP students the required way to fulfill your requirement is via the formal grant-writing course is offered by the IBGP program (INTBP 3240, fall, 2.0 Cr). MD/PhD students take a comparable course through the MSTP program.

5.8 Research in Progress (RIP)

All CMP students will meet the last Monday of the month from 5-6 PM to talk about the research being conducted by CMP students. Generally, two students will do a 30 min. overview of their research although other topics of relevance to the CMP student body can also be discussed. The intent is to introduce newer students to the work of the more senior students as well as to get constructive feedback on the research projects being performed. RIP is open to faculty as well.

5.9 Professional Development

Currently this is not a requirement; however, the graduate office is working hard to make information accessible to students from the very beginning of their experience at Pitt. The Office of graduate studies now offers a variety of services including a Career Club. <https://somgrad.pitt.edu/current-students/career-and-professional-development>

As an alternative, there is an ongoing two-part course in the fall and spring that students may elect to participate in: MSMPHL 3340 and 3341; Foundations of Successful Career Planning and Development Parts 1 and 2, for a total of 2 credits.

6. COURSE DESCRIPTIONS

MSCMP 2280 (FALL only) (01.0 Cr)

Basic Understanding of EDI as Related to Graduate Education

Students will be introduced to the concepts of Equity, Diversity and Inclusion in the context of graduate education at the University of Pittsburgh School of Medicine. This will include formal training in activities related to title IX as required by the University of Pittsburgh. Note: content of this course is also embedded in the 4-credit Foundations Conference (INTBP 2005).

MSCMP 2700 (ALL) (01.0 to 14.0 Cr)

MS Thesis Research

This is a directed research project that results in a thesis for a master's degree.

MSCMP 2730 (SPRING ONLY-core course) (03.0 Cr)

Molecular Mechanisms of Tissue Growth and Differentiation

This course covers the anatomy, embryology, histology, function, and growth regulation (growth factors, receptors, and signaling pathways) of various differentiated tissues. Multidisciplinary lectures are given by the members of the various departments including pathology, cell biology and physiology, medicine, and surgery who have on going research in these areas. The course is designed to offer detailed information on specific tissues, tissue-tissue interactions, and overlapping cellular and molecular pathways that exist in multiple tissues. (Required for all)

MSCMP 2740 (SPRING ONLY-IBGP hard elective) (03.0 Cr)

Molecular Pathobiology

This course is structured to introduce students to the integration between basic and clinical research on the molecular pathogenesis of relevant human diseases. The course will provide students with an overview of the natural history of selected diseases, their diagnosis and clinical management. This will be followed by in-depth discussions concerning the pathologic substrate of the disease, with particular attention focused on the molecular mechanisms of disease progression. In addition to current basic science research, students will be exposed to the clinical impact of basic science discoveries upon the development of new therapeutic interventions. Discussions of current research trends and factors that enhance fundability of research projects will ensue. Each disease module will contain lectures from the faculty followed by presentations of current research papers by the students. These research presentations/discussions will be peer reviewed by fellow students and the faculty, and form the basis of the final grade.

MSCMP 2750 (SPRING AND FALL-core course) (01.0 Cr)

Research Seminar

Students present their research (allowed one time) or a recent research article from a broad range of topics selected by the student in consultation with a faculty advisor. The course meets weekly. Emphasis is placed on a careful analysis and critical evaluation of the manuscript as well as the development of teaching and speaking skills needed for scientific presentation. The student is expected to elucidate issues relevant to the topic and to answer questions from other graduate students and faculty. (Required a minimum of 5 semesters)

MSCMP 2760 (SPRING ONLY) (03.0 Cr)

Intro to Tissue Engineering and Regeneration (sponsored by BioE)

The purpose of this course is to introduce students to tissue engineering. Tissue engineering is defined as the development and manipulation of laboratory-grown molecules, cells, tissues, or organs to replace and/or support the function of injured body parts. Tissue engineering is highly interdisciplinary and therefore crosses numerous engineering and medical specialties. Upon completing this course, the graduate and undergraduate students should:

- understand the basic principles behind human cell and tissue biology
- be familiar with the general types of biomaterials used in tissue engineering
- understand techniques utilized to design, fabricate, and functionally assess tissue engineering systems
- be able to apply the combined knowledge of tissue organization and tissue engineering strategies to design a unique, reasonable tissue engineering solution.

This five-part course covers cell and tissue biology, biomaterials, drug delivery, engineering methods and design, and clinical implementation.

- MSCMP 2770** (SPRING ONLY) (03.0 Cr)
Biomaterials and Biocompatibility-(sponsored by BioE)
 This course covers the chemical and physical properties of Orthopaedic and Cardiovascular Biomaterials, wear and corrosion of implant materials; fracture healing, inflammatory response; fixation and loosening of permanent implants; protein absorption; coagulation cascade, bacterial adhesion.
- MSCMP 2780** (ALL) (03.0 Cr)
Special Topics
 One or more student(s) will focus on a selected topic (usually defined by the students) in cellular and molecular pathology and discuss the primary literature pertaining to the topic. Students will be evaluated on their discussions and presentations and, write a paper under the direction of a faculty advisor.
- MSCMP 2790** (ALL) (01.0 to 9.0 Cr)
Directed Study
 This course provides the student an opportunity to carry out a specific laboratory project in any area of interest in cellular and molecular pathology.
- MSCMP 3700** (ALL) (01.0 to 14.0 Cr)
PhD Dissertation Research
 After advancement to candidacy for the PhD degree, students enroll in this course to pursue original experimental laboratory research, the results of which will provide the substance of their doctoral dissertation. A minimum of 40 credits of this course are required for the PhD degree in the School of Medicine.
- MSCMP 3710** (FALL ONLY-IBGP hard elective) (03.0 Cr)
Cancer Biology and Therapeutics
 This presents biochemical and clinical aspects of cancer biology and therapy and is designed for graduate students in basic sciences or medicine. The lectures will cover: Biology of Normal and Neoplastic Cells, Mechanisms of Neoplastic Transformation, Chemical and Environmental Carcinogenesis, Viral Oncogenesis, Breast and Prostate Cancer, Chemotherapy, Radiotherapy, Gene Therapy, Tumor Immunology, and Nutrition and Cancer.
- MSCMP 3730** (SPRING AND FALL) (01.0 Cr)
Topics in Experimental Neuropathology
 This course meets once every other week to critically evaluate the latest scientific literature concerning diseases of the central nervous system. Participants include the faculty, residents, and fellows within the Division of Neuropathology. Emphasis will be placed on methodologies as they are applied to the study of human neurologic diseases, with discussion of the most recent hypotheses concerning cellular and molecular mechanisms that cause human disease. Student participants will present scientific papers and lead the classroom discussion.
- MSCMP 3735** (FALL ONLY) (03.0 Cr)
ECM in Tissue Biology and Bioengineering
 This course presents a comprehensive overview of the biochemical composition of tissue matrix, the receptors that bind and signal through the matrix, and how these matrix interactions are important for basic biology and tissue engineering. Topics include gene expression, mechanistic interactions, and cellular interaction/communication.

MSCMP 3740 (SPRING ONLY)**(03.0 Cr)****Stem Cells**

The course entitled “Stem Cells” will provide a comprehensive overview on this intriguing and highly debated topic. The course will focus on the biology of stem cells and their role in health and disease with emphasis on development, carcinogenesis and tissue engineering. Lectures on various aspects of stem cells from renowned experts will cover both embryonic and adult stem cells. Specific lectures will include stems cells in the blood, liver, brain, muscle, kidney, pancreas, prostate, lung, gut, skin and eye. Students will also be educated on therapeutic cloning as well as bio-ethical issues and existing laws governing stem cell research.

Letter grades will be based on midterm and final exams as well as on the attendance in the lectures.

MSCMP 3750 (SPRING ONLY)**(03.0 Cr)****Angiogenesis: Molecular Pathways and Pathophysiological Functions**

This course will provide extend basic knowledge of developmental, cellular, molecular biology of angiogenesis and most recent advancements in its clinical applications. Topics include: 1) Angiogenesis in physiological and pathological processes; 2) Molecular and cellular regulation of angiogenesis; 3) Current advances in angiogenic therapies. Recent outstanding research publications will also be discussed.

MSCMP 3760 (SPRING AND FALL)**(01.0 Cr)****Regenerative Medicine Research Seminar**

The seminar in regenerative medicine is geared towards providing updated information on topics in the field of regenerative medicine, tissue engineering and stem cell applications. Through biweekly seminars, the students will be acquainted to the recent advances in the ever-growing field of regenerative medicine. Experienced faculty will deliver lectures in this seminar series.

MSCMP 3770 (SPRING ONLY)**(03.0 Cr)****Cell Therapy**

This course is meant to be unlike any other in the graduate curricula, showcasing cell therapy from theory to practice, from the bench to the bed-side. For each area of cell transplantation the lectures will be given by faculty who have implemented cell transplantation techniques and moved them into clinical therapy. Most of the lectures in the course and all clinical application lectures will be given by those who actually do the patient transplants. Immunology and pharmacology will be addressed as it directly relates to cellular therapy. Gene therapy and stem cell biology will not be addressed individually, but will be raised in the context of specific applications. Course meetings will consist of approximately 2 lectures per discussion session. The first lecture will present the basic research leading into a particular area of cell therapy area such as animal models used for preclinical studies, and the second will focus on the clinical application of that particular cell therapy for specific disease(s). The grade for the course results from attendance at lectures and the submission of a paper in an area relevant to Cell Transplantation / Cell Therapy. At the conclusion of this course students should: be able to critically read and review the literature in the field of cellular therapy; know the mechanisms of rejection of cellular transplants from both allotypic and xenotypic sources and be familiar with strategies to avoid transplant rejection; be familiar with the application of cellular therapy techniques to a variety of disease states; have a perspective and be conversant on relevant ethical issues associated with the field of cellular therapy.

MSCMP 3790 (FALL ONLY-IBGP hard elective)**(03.0 Cr)****Basics of Personalized Medicine**

Rapid and ongoing discoveries in basic biomedical research are leading to a world where there is a demand for personalized medicine. Never the less, on a practical level, it is complicated to translate the findings from the basic scientific arena into clinical practice. This course will show students how findings from basic research can be translated into clinically relevant tests for the

diagnosis and treatment of patients. The course will provide an overview of the past, present, and future of basic biomedical research as it relates to this subject.

7. TEACHING BY GRADUATE STUDENTS

Teaching is seen as an important part of the graduate training program. It provides experience in classroom instruction as well as an opportunity to obtain a broader perspective of pathology. **Pathology Research Seminar is designed to give students a teaching-like opportunity;** however, teaching is not a required component of the CMP Graduate Program. Therefore, students must take the initiative to obtain other teaching experiences. Certain faculty members allow graduate students to give classroom lectures in their graduate courses. Additionally, the IBGP offers teaching opportunities through group sessions and private tutoring for the Foundations Course. Students wishing to obtain this teaching experience should contact the Program Director.

8. EVALUATION OF GRADUATE STUDENTS

8.1 Yearly Progress Reports

By June 30th of each year, all students must submit a brief progress report summarizing their activities during the past year and optimally, include their plans for future study. This report will serve as the focal document for the annual student evaluation by the Director of the CMP Graduate Training Program, although reports from the student's research advisor, committee chairpersons, course instructors, teaching supervisors, etc. will also be incorporated into the evaluation. Therefore, the progress report should incorporate everything the student wishes the faculty to know at the time of the evaluation. It should be organized as follows:

- a) statement of last year's goals and the extent to which they have been achieved,
- b) a list of the courses taken and the grades attained,
- c) a summary of research efforts,
- d) a list of Program "milestones" completed,
- e) a list of any awards or honors attained,
- f) a list of manuscripts and abstracts published,
- g) attendance and presentations at scientific conferences, and
- h) a statement of specific objectives for the coming academic year.

The length of the progress report should be approximately 1 page. Students should also turn in an updated Curriculum Vitae in School of Medicine format, as well as an NIH-formatted Biosketch for a fellowship. While they may seem redundant, each of these documents serves a different purpose.

The UPSOM link can be found at:

<https://medfaculty.pitt.edu/sites/default/files/UPSOMCV32021.pdf>

The Biosketch instructions can be found here:

<https://grants.nih.gov/grants/forms/biosketch.htm>

These reports should be submitted to the Director via the Administrative Coordinator. Yearly progress will then be evaluated by the Director and Associate Director.

8.2 Termination of a Student from the Graduate Program

Students may be terminated from the Graduate Program for failure to pass two required core courses or one of these courses on successive occasions, failure to pass the Comprehensive Examination, or Doctoral Thesis Examination, failure to make adequate progress in laboratory research, or breaches in legal ethical conduct such as plagiarism. Except for instances involving breaches in legal or ethical behavior, students will not be terminated from the Program without first being notified in writing that they have been placed on probation. This written communication will include a detailed description of the reason(s) for placing the student on probation, and the goals the student must accomplish in order to be taken off probation. Students will typically have one term to resolve their problems and get off probation or they will be terminated from the Program. This “Program Probation” is different from “University Probation” in that it does not preclude financial support from the University.

When a student who is not on probation fails one of the major examinations listed above (Comprehensive Exam or Dissertation Defense), the student will be placed on probation and given a second opportunity to pass that examination. Failure on the second examination shall result in termination from the Program. When a student who is already on probation fails one of the major examinations, they may or may not be given a second opportunity to pass that examination, at the discretion of the Director.

When a student is informed that his/her laboratory research progress has been determined not to meet program standards, the student will be given one term to improve laboratory skills and productivity before being reevaluated. A second determination that laboratory performance is substandard, at this time or during any subsequent evaluation, will result in a student’s termination from the program.

In all cases, the termination of a student requires a decision by the Director and cannot be made by an individual faculty member or examination committee. Terminations are final.

8.3 University Probation

The University requires that all graduate students maintain a QPA of 3.0 or above to undergo the preliminary evaluation, to take the comprehensive examination, to be admitted to candidacy for the PhD degree, and to be graduated. Students whose QPA falls below 3.0 must be put on “University Probation” and cannot be awarded financial assistance from the University (e.g., teaching assistantship) until they have re-established a QPA of 3.0 or above.

8.4 Terminal Master’s Degree

If students leave the program, whether voluntary or not, after having completed the following requirements, they may write to the Director, petitioning to receive a Masters Degree. Students wishing to receive such a degree must fill out appropriate forms, as mandated by the University. The requirements for a Master’s degree include: all of the PhD Coursework, including successfully passing the Comprehensive Examination. Students must also submit and defend a

Master's thesis to a committee consisting of at least three graduate faculty members. The instructions for writing a the Master's thesis can be found in the University's Electronic and Theses Dissertation guidelines (www.etsd.pitt.edu/etsd-format-guidelines)

9. SPECIAL STATUS

9.1 Leaves of Absence

Students may request either a short or prolonged leave of absence from the Program for various reasons including issues such as illness and/or parental accommodation leave. Extended requests should be made in writing to the Director. These requests should include the reason for the request and the anticipated duration of the requested leave. Leaves of absence are subject to the approval of the Associate Dean for Graduate Studies of the appropriate school (i.e., depending on the student's current mentor). Students considering taking an extended leave of absence should consult the guidelines at:

<https://catalog.upp.pitt.edu/content.php?catoid=214&navoid=21575#statute-of-limitations-leaves-of-absence>. The current Pitt parental accommodation policy can be found here:

<https://www.gradstudies.pitt.edu/sites/default/files/assets/GradParentalAccommGuidelines6-1-22.pdf>

9.2 Vacation Policy

Students may wish to take a short break during their time in the Program. In accordance with Pitt guidelines, CMP strongly recommends that these leave times should be pre-approved by the student's mentor, with a maximum requested time away of no longer than 10 working days/year. This is in addition to the Pitt calendar holidays. Also, due to frequent difficulties recently encountered with Visas when students returned to the USA, CMP strongly advises that foreign students not return to visit their home countries until having passed their comprehensive exams unless absolutely necessary. Students must get pre-approval from the Program Director if they anticipate being gone longer than 2 consecutive weeks.

9.3 Attendance at Scientific Meetings

It is expected that most students will attend scientific meetings during their time in the Program in an effort to further their careers. While there are no formal policies governing attendance at meetings, it is expected that attendance at these meetings will be pre-approved and funded with help by the student's mentor. Further, it is expected that meeting attendance will not be excessive (once or twice per year is a general guideline) and that every effort will be made so that attendance does not substantially interfere with class attendance. When a student wishes to attend a meeting that is in conflict with a scheduled class, the student is expected to show good intent by notifying the teacher prior to submitting their registration for the meeting.

9.4 Disability Accommodation

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact the program director (Dr. Mars), your instructor, and the Disability

Resources and Services (DRS) division at the University. DRS can be reached at 412-648-7890 or 412-383-7355 (TTY). DRS will verify your disability and determine a reasonable accommodation for the course.

10. MILESTONES

Note: Specific forms are required for the different milestone examinations. Students should request that the Graduate Program Coordinator (Amanda Bytzura, amb430@pitt.edu) prepare the relevant forms at least one week before the examination.

10.1 Preliminary Evaluation

All IBGP students must pass a preliminary evaluation at the end of their first year. This evaluation is performed by the IBGP program directors and is a review of the first-year coursework and rotation reports for each student. Upon recommendation of the IBGP directors, students are advanced to the second year of graduate training and are permitted to officially join a particular laboratory and apply for admission to the Cellular and Molecular Pathology Program. The transfer form is obtained from the Graduate Office.

10.2 Comprehensive Examination

The Comprehensive Examination is a major requirement that a student must pass prior to being admitted to candidacy for the doctoral degree. For students entering via the IBGP track, this examination is typically taken after the second year of graduate school (after one year for MD/PhD students) and provides the student with an opportunity to master a literature that is relevant to their research interests and ultimately to demonstrate that the necessary competency has been achieved.

The specific educational goals of the Comprehensive Examination are to test the student's ability to:

- Independently evaluate and critique a body of pathology literature
- Integrate the acquired information into broad conceptual schemes
- Develop testable hypotheses
- Devise experimental approaches and thereby evaluate hypotheses
- Demonstrate the communication skills required to present and defend scientific ideas in oral and written formats

The topic of the Comprehensive Examination is expected to overlap with the student's research interests and dissertation goals. In addition, the proposed plan is expected to be original in its conception and scholarly in its execution. The Major Advisor is only permitted to assist in generating the specific aims of the written proposal.

Students are required to complete the Comprehensive Examination by December 31st within the third year of the graduate program (second year for MD/PhD). Any requests for delay in this schedule should be made in writing to the Director; such requests should include a reason for the delay, as well as the time when the student plans to take the exam. Note that students are encouraged to schedule the Comprehensive Examination as soon as possible. The student must establish their Comprehensive Examination committee and set up a tentative time frame for the exam by June 30 of their second year (first year for MD/PhD).

10.2. a. Committee

The Comprehensive Examination committee is nominated by the student and Major Advisor with final approval by the Director. This committee must be established by the end of the second year (June 30). The committee consists of five or six members and, must contain a majority of members from the CMP Graduate Training Faculty. The Major Advisor is generally a member of the committee but cannot serve as its Chairperson. Although not required, it is recommended that the Chairperson be a member of the CMP program. Prior to the first committee meeting, the student and Major Advisor, in conjunction with the Director, should select a Chairperson.

10.2. b. Written Examination

Students must write a mock “grant application” based on the Comprehensive Examination topic. Thus, students will need to evaluate the literature in the area, formulate a significant and relevant hypothesis, and devise experimental strategies to test the hypothesis. The written report should follow the basic form of a printed NIH R01 or F30/F31 application and should be a realistic proposal for three years of research. It should include all sections characteristic of a research grant proposal as follows. *Specific Aims*: This section should include a statement of the hypothesis to be tested and the goal or the objectives of the proposal (1 page). *Background*: Concise presentation of pertinent literature in the chosen area of interest, setting the appropriate context of the proposed research plan (2 – 4 pages). *Significance*: Brief summary of the broad significance of the research to the advancement of the relevant scientific field (1-2 paragraphs). *Preliminary Data*: This section should include a brief description of the types of preliminary data the students feels are necessary to support the proposal and may include data obtained to date by the student (1 page). *Research Plan*: Description of the methods and experiments that are proposed to achieve the research goals of the proposal. This section should place less emphasis on methodological details and more emphasis on anticipated outcomes and potential experimental pitfalls (3 – 4 pages). *Literature Cited*: Full citations of all referenced literature should be included. The entire document, not including references cannot exceed 13 single-spaced pages with students encouraged to follow the F30/F31 guidelines if there is an interest in eventually applying for one of these grants. (For margins and font requirements, see instructions for preparing NIH grant applications.) Students are encouraged to look at actual grant applications submitted by their Major Advisor or other students to get a sense of what is included in an application.

While working on the written portion of the Examination, **it is only appropriate for students to discuss their ideas with their committee members, as well as with their Major Advisor, in a very general manner. Students are encouraged to show their Specific Aims to their Major Advisor, so they can receive feedback as to whether or not they are going in an appropriate direction. However, students should complete all subsequent sections of the proposal without aid** and they are not allowed to receive assistance with the written drafts of their Examination from any committee members. **A minimum of one week prior to the exam, a copy of the written portion of the exam should be sent to the graduate program coordinator as well as all comprehensive committee members.**

10.2. c. Oral Examination

Approximately one week after the student submits the written “application”, there will be an oral examination. The oral examination consists of a presentation of the proposal (lasting ~40 minutes) followed by an oral examination administered by the committee. At the oral examination, students will be expected to defend their hypothesis and to address questions concerning all background information relevant to the topic, significance, and design of the experiments they proposed. It is expected that the entire oral examination (presentation and defense) will last 2-3 hours.

10.2. d. Evaluation

At the end of the oral examination, the student will be excused from the room and the committee will evaluate the student’s performance. The student will then be immediately informed of the decision of the committee. The possible outcomes are pass, partial pass, or fail.

Students may receive a partial pass if they were deficient in some but not most of the areas on which they were examined. Significant problems associated with either the written or oral portion of the examination, or both, that are not so severe as to result in a failing score may result in a “partial pass”. If the committee decides on a partial pass, they must define those areas of the performance that were deficient and provide specific criteria that must be met for the student to pass. For example, the committee might decide that experimental descriptions were poor throughout the written portion of the examination, and thus the student must submit revised descriptions of the proposed experiments. As another example, the committee might decide that some of the student’s oral answers were unacceptable, and thus the student must retake the oral portion of the examination. Whatever the reason for the partial pass, the committee must present the student with a detailed description of what needs to be done to satisfactorily complete the examination. **Partial passes must be remedied within eight weeks of the initial oral examination**, or the student will be considered to have failed the examination.

Students who fail the Comprehensive Examination will be allowed to take the examination a second time provided that they are not already on probation. **The second examination must occur within three months of the initial examination.** The examination must be passed before a student can apply for admission to candidacy for the PhD. Once this examination has been passed, the Program notifies the appropriate Dean of Graduate Studies of that fact. The Comprehensive Examination report is submitted to the School of Medicine Graduate Office (example of DocuSign form located at end of handbook).

10.3 Dissertation Proposal

The dissertation is the culmination of the graduate program. The dissertation is intended to embody an extended original investigation of a problem of significance in the field of pathology. It must add to the general store of knowledge and to understanding in this field. And it must serve to demonstrate each of the competencies described at the outset of these guidelines.

10.3. a. Dissertation Committee

After successful completion of the Comprehensive Examination, the student and his/her Major Advisor propose a doctoral committee for approval by the Director and University. This committee consists of five or six members who are typically the same faculty as the Comprehensive Examination Committee. At least four of the members (including the Major Advisor) must be

members of the CMP Graduate Training Faculty and at least three of these must be from the school in which the student is registered (i.e., School of Medicine). At least one member of the committee must be from outside the Department of the Major Advisor. All committee members from the University must be members of the Graduate Faculty. According to University Regulations, the Major Advisor must be a member of this committee; however, in the CMP Program, the Major Advisor retains his/her status as an advisor, both to the student and to the committee, and does not chair the committee meetings. The student should select one of the committee members from within the CMP Program to serve as the Chairperson. Please refer to Milestone Forms in Section 12 to preview the DocuSign of the Dissertation Overview/Prospectus form.

10.3. b. Dissertation Proposal and Overview Meeting

A dissertation proposal and an overview meeting are University requirements. The proposal submitted as the grant application for the Comprehensive Examination (with suggested amendments), that has been approved by the examining committee, most often serves as the dissertation proposal. The first meeting must occur within six months from passing the Comprehensive Examination. Upon completion of the committee meeting, the Dissertation Overview/Prospectus form is submitted to the School of Medicine Graduate Office (Please refer to section of Milestone Forms in Section 12 to preview a DocuSign of this form).

10.3. c. Admission to Candidacy for the PhD degree

After successful completion of the overview, typically the first dissertation committee meeting after completing the Comprehensive Examination, the student files an application for admission to candidacy indicating the dissertation topic. Students must complete this milestone to receive PhD dissertation credit hours. This application must be approved by the Director and the Associate Dean for Graduate Studies of the school in which the student's mentor is appointed (i.e., School of Medicine). It is a University requirement that this be done at least eight months prior to the dissertation defense. Please refer to section of Milestone Forms in Section 12 to preview a DocuSign of the Admission to Candidacy form.

10.3. d. Bi-Annual Meetings

Students must schedule periodic meetings each year with their committee to discuss the progress of experiments and to review new data. Specifically, **per University rules, students must meet with their committee at least twice per year**. The committee must write a summary report of each meeting and submit it to the program administrators so it can be given to the student and added to their file. Please refer to section to Milestone Forms in Section 12 to preview a DocuSign of this form. Report forms should be obtained from the Graduate Coordinator and returned to the Graduate Coordinator upon completion.

To ensure that both students and mentors can share their concerns with the committee, it is recommended that at some time during the meeting, the committee meet with just the mentor without the student (suggested to happen prior to the beginning of the meeting) and the student without the mentor (suggested to happen at the end of the committee). **Any significant feedback from either mentor or mentee should be communicated to the Program Director.**

While it is optimal that all committee members be present for committee meetings, for the biannual meetings only, students are allowed to proceed with a meeting if only 4 members are able to be present, as long as those members include the Major Advisor, the committee chair, and at least one

outside committee member (i.e. one not in CMP). In these cases, the student must schedule a separate meeting or meetings with the missing committee members.

10.3. e. Written Dissertation

Information regarding the written dissertation can be obtained from the Office of the Associate Dean for Graduate Studies (also see www.etsd.pitt.edu/etsd-format-guidelines). As a general rule, (a) the introduction to the dissertation should include a more thorough review of the literature than usually is the case for a research article, (b) the methods section should include all necessary information concerning the conduct of the research, including procedural information already published, (c) the student may wish to include within the results section (or in an appendix) some data which, because they are confirmatory or incomplete, will not be published, and (d) there must be a general discussion section that is more broad than a discussion section associated with a single manuscript.

Manuscripts (including articles in any state of the publication process, e.g., published, submitted for publication, or completed but not yet submitted) authored or co-authored by the student and based on the research conducted for the dissertation study may be included in the dissertation. To logically integrate this work into a dissertation, the student is required to write extensive introduction and discussion sections that give an overview of the objective or objectives of the research and draw general conclusions from the assembled data. If a manuscript is co-authored, the contribution of the student must be clearly delineated in the preface so the committee can ascertain the student's own work satisfies the requirements of a dissertation. The Style and Form Manual gives instructions on incorporating manuscripts into the dissertation.

A completed dissertation must be submitted to all committee members at least two weeks prior to the defense. The student can expect his/her advisor to read the dissertation prior to its submission, and the submission of the dissertation implies that the student's advisor has approved the dissertation as ready for distribution to the committee.

10.3. f. Application for Graduation

Candidates for graduation must file an official application for graduation in the Office of the Associate Dean for Graduate Studies in the first month of the term in which graduation is expected. It is the student's responsibility to complete this task. If the student does not successfully defend his/her thesis during this term, the student must file an application for graduation each following term until the student graduates. **Students, be aware that there are costs including fees and printing charges associated with graduation and budget according.**

10.3. g. Announcement of Thesis Defense

At least one month before the final examination, the student provides the Graduate Coordinator with the title of the dissertation and the time and place for its defense. This information is sent to all appropriate departments of the University. It is assumed that all graduate

students, postgraduate fellows, and faculty within the CMP Program will be invited to attend the dissertation defense.

10.3. h. Final Oral Examination

The Chairperson of the doctoral committee will oversee the examination and explain the guidelines to those in attendance at both the public and private defense. Generally, the mentor will introduce the student. The student begins by making a public presentation of the research project.

Approximately 45 minutes are allotted for this presentation. After a brief period of questions and discussion from the audience, the candidate and the doctoral committee move to a conference room to complete the oral examination. **The Major Advisor does not participate in this examination and must remain silent throughout the process.** When the questioning is complete, the candidate leaves the room while the committee evaluates the dissertation and its defense. The Major Advisor may be asked to leave for a portion of the committee's deliberation. The committee selects one of the following options: pass, revision of the written document and/or additional oral questioning at a later time or, fail. If the committee requires revision of the written document and/or additional oral questioning, this needs to be completed in a three month period. If the student fails the thesis defense, the student may take the examination again within three months. Failure to pass the thesis defense on a second occasion may result in the student being terminated from the program. At the conclusion of the defense, the student is provided with a verbal summary of the committee's deliberations. In addition, a report signed by all members of the doctoral committee, including the Major Advisor, is sent to the Associate Dean for Graduate Studies. When the decision of the committee is not unanimous, the matter is resolved by the Dean.

10.4. Final graduation steps:

Once you have committee approval to defend, you will need to contact the IBGP graduate office for information on how to proceed. **The applications are due during the early part of the term you intend to graduate and the dates will change each term.** Note: There is a fee for graduation. Also, please note you must be registered for credit in the term of graduation. Finally, you must fill out a defense information sheet and submit it to the IBGP office about 3 weeks prior to your defense so that the office can prepare and send out defense announcements to the graduate faculty and students. After your public defense, you must submit your final thesis electronically. Instructions on how to prepare and submit your electronic thesis can be found at the following web link: www.etd.pitt.edu

After your theses is submitted electronically, successfully uploaded, and approved by the graduate office, notify the graduate school director (Dr. Mars), graduate coordinator (Amanda Bytzura) and payroll administrator (Carolyn Nolte) for the following reasons:

- Dr. Mars (wmars@pitt.edu) needs to write a final CMP exit letter on your behalf to the School of Medicine.

- Carolyn Nolte needs something in writing indicating exactly when you are leaving the CMP program so she can make sure the payroll paperwork is in order. Even if you do not leave the University and accept a post-doc position within the system, you will no longer be a GSR and your paperwork will need to be updated. Send Carolyn Nolte noltecr@upmc.edu an e-mail stating when your official last date of employment will be.
- Send Amanda Bytzura (amb430@pitt.edu) an e-mail with your new contact information (where you will be--how we can reach you, e-mail, etc.) so that she can send you an exit interview. This is a great opportunity for you to help us understand how we can improve our program.

11. CALENDAR OF MILESTONES AND DEADLINES

First Year of Graduate School

- Select Major Advisor and Program end of summer term

Second Year of Graduate School (first year for MD/PhD Candidates)

- Submit Annual Progress Report and updated CV/Bio by June 30
- Establish Comprehensive Examination Committee by June 30

Third Year of Graduate School (second year for MD/PhD Candidates)

- Complete Comprehensive Examination before December 31
- Submit Comprehensive Examination Report upon approval by committee
- Meet with Dissertation Committee by June 15
- Submit Dissertation Overview Report upon approval of committee
- File for Admission to Candidacy upon approval of proposal
- Submit Annual Progress Report and updated CV/Bio by June 30

Subsequent Years of Graduate School

- Submit Annual Progress Report and updated CV/Bio by June 30 of each year
- Bi-Annual Meetings with Dissertation Committee two/year
- Application for Graduation term of graduation
- Announcement of Dissertation Defense > 1 month prior to defense

12. MILESTONE FORMS

On subsequent pages, please find sample milestone forms (DocuSign) used in the CMP Graduate Training Program. **These are provided simply to give you an idea of what each form looks like and what information is contained within each. You must request that the CMP coordinator, Amanda Bytzura (amb430@pitt.edu), fill them out properly for you before each meeting that you hold.**

Please be sure to notify the Graduate Coordinator if anything regarding your progress has changed, such as a change in committee members or the Title of the Dissertation. Also, please be sure to notify the Graduate Coordinator of the date of each milestone so this information to be included on the forms.



COMPREHENSIVE EXAMINATION REPORT

Doctor of Philosophy

University of Pittsburgh School of Medicine
Graduate Division of Biomedical Sciences

Student's Name	SS#	Date of Examination
-----------------------	------------	----------------------------

Academic Program	Passed	Failed
Cellular and Molecular Pathology		

EXAMINATION COMMITTEE:

Chair of the Committee

COMMENTS:

SUBMIT THIS FORM TO THE GRADUATE STUDIES OFFICE

NOTE: This examination should be administered approximately at the time of completion of formal course requirements and should be passed at least eight months before the scheduling of the final oral examination and dissertation defense. In no case may the comprehensive examination be taken in the same term in which the student is graduated. Results must be reported no later than the last day of the term in which the examination is administered.

DISTRIBUTION OF COPIES: WHITE-Submit to Graduate Studies Office; YELLOW-Issued to Department; PINK-Issued to Student. PITT 1016 (0397)

FORM II



**NOMINATION OF A DOCTORAL DISSERTATION ADVISORY AND FINAL
EXAMINATION COMMITTEE**

University of Pittsburgh School of Medicine
Graduate Division of Biomedical Sciences

Student's Name	SS#	Date of Examination
-----------------------	------------	----------------------------

Proposed Title of Dissertation

I hereby agree to serve as Major Advisor for this Candidate and to supervise the preparation of his/her dissertation. I recommend that the following persons be appointed to serve as the Doctoral Dissertation Advisory and Final Examination Committee.

COMMITTEE MEMBERS

ACADEMIC PROGRAM

SIGNATURE

COMMITTEE CHAIR

MAJOR ADVISOR

DATE

APPROVED:

ACADEMIC PROGRAM CHAIR

DATE

DEAN OF GRADUATE STUDIES

DATE

SUBMIT THIS FORM TO THE GRADUATE STUDIES OFFICE

There shall be a minimum of five members on the dissertation committee including the thesis advisor. The dissertation advisor may or may not serve as the chair of the examination committee; it shall be determined by training program policy. A majority of the committee, including the advisor, must have graduate faculty status, and must be from the student's training program. A minimum of one graduate faculty member from the university community who is not a member of the student's training program must participate on the committee. The dissertation committee must be approved by the director of the student's training program prior to seeking approval from the Graduate Dean. Only upon this approval may the student meet with his/her committee at their Overview/Prospectus meeting and proceed with Admission to Candidacy.

DISTRIBUTION OF COPIES: WHITE-Submit to Graduate Studies Office; YELLOW-Issued to Department; PINK-Issued to Student.



DISSERTATION OVERVIEW/PROSPECTUS MEETING

Doctor of Philosophy

University of Pittsburgh School of Medicine
Graduate Division of Biomedical Sciences

Student's Name	SS#	Date of Meeting
Academic Program	Approved	Not Approved
Cellular and Molecular Pathology		

This student has prepared a dissertation proposal and presented it to this committee. He/She has carefully formulated a plan and permits the doctoral committee to provide guidance in shaping the conceptualization and methodology of that plan.

Doctoral Dissertation Advisory and Final Examination Committee:

MAJOR ADVISOR

COMMITTEE CHAIR

COMMENTS:

SUBMIT THIS FORM TO THE GRADUATE STUDIES OFFICE

NOTE: This meeting should be conducted once the Nomination of a Dissertation Advisory and Final Examination Committee Form has been approved by the Dean of Graduate Studies. Results of this meeting must be reported no later than the last day of the term in which the meeting occurs.

DISTRIBUTION OF COPIES: WHITE-Submit to Graduate Studies Office; YELLOW-Issued to Department; PINK-Issued to Student.



APPLICATION FOR ADMISSION TO CANDIDACY
FOR THE DOCTORAL DEGREE

University of Pittsburgh School of Medicine
Graduate Division of Biomedical Sciences

Name of Applicant & Date	SS#	Department Cellular and Molecular Pathology
-------------------------------------	------------	--

I am a student with full graduate status and: have satisfied the requirements of a preliminary evaluation, have completed formal coursework with a minimum quality point average of 3.00, have passed the comprehensive examination, and have received approval of the proposed subject and plan of the dissertation from the doctoral committee following an overview/prospectus meeting of my committee. I hereby petition the Graduate Faculty of the School of Medicine for Admission to Candidacy for the degree of Doctor of Philosophy, and propose the following topic for my dissertation:

DOCTORAL DISSERTATION ADVISORY COMMITTEE

We hereby support the above petitioner for admission to candidacy, and will supervise the preparation of his/her dissertation.

MAJOR ADVISOR

COMMITTEE CHAIR

APPROVED:

CHAIR OF THE ACADEMIC PROGRAM DATE

DEAN OF GRADUATE STUDIES DATE

SUBMIT THIS FORM TO THE GRADUATE STUDIES OFFICE

DISTRIBUTION OF COPIES: WHITE-Submit to Graduate Studies Office; YELLOW-Issued to Department; PINK-Issued to Student.



BI-ANNUAL MEETING WITH
DOCTORAL DISSERTATION ADVISORY COMMITTEE

University of Pittsburgh School of Medicine
Cellular and Molecular Pathology Program

Student's Name:

Date of Committee Meeting:

DOCTORAL DISSERTATION ADVISORY COMMITTEE

We hereby acknowledge we have met with the above student to discuss the progress of the student's dissertation. We find the progress made to date to be:

_____ satisfactory

_____unsatisfactory

Committee Members:

Signature:

Major Advisor

Committee Chair

Chair Comments:

Advisor Comments:

APPROVED:

Chair of the Academic Program

Date

Please return this form to the Pathology Graduate Program Coordinator



DISSERTATION DEFENSE REPORT

Doctor of Philosophy

University of Pittsburgh School of Medicine
Graduate Division of Biomedical Sciences

Student's Name	SS#	Date of Defense
-----------------------	------------	------------------------

Academic Program	Passed	Failed
Cellular and Molecular Pathology	Passed with honors	Passed with Revisions

Title of Dissertation

DOCTORAL DISSERTATION AND FINAL EXAMINATION COMMITTEE:

Major Advisor

Chair of the Committee

SUBMIT THIS FORM TO THE GRADUATE STUDIES OFFICE

DISTRIBUTION OF COPIES: WHITE-Submit to Graduate Studies Office; CANARY-Issued to Department; PINK-Issued to Student.



DISSERTATION APPROVAL REPORT

Doctor of Philosophy

University of Pittsburgh School of Medicine
Graduate Division of Biomedical Sciences

Student's Name	SS#	Date
-----------------------	------------	-------------

Academic Program	Approved	Not approved
Cellular and Molecular Pathology		

Title of Dissertation

The above noted dissertation has been defended and corrected, and is hereby approved by this committee:

Major Advisor

Chair of the Committee

NOTE: This report should be completed once the defended dissertation is corrected and in its final form. This report must be submitted with the defended and corrected dissertation to the Graduate Studies Office no later than the last day of the term in which the defense takes place.

DISTRIBUTION OF COPIES: WHITE-Submit to Graduate Studies Office; CANARY-Issued to Department; PINK-Issued to Student.

13. CMP GRADUATE TRAINING FACULTY

<https://www.path.pitt.edu/training/research-opportunities/cellular-and-molecular-pathology-cmp-graduate-training-program> for a description of the program

Current full time/recent participants:

Dr. Kalil Abdullah	(412) 647-7614	abdullahkg@upmc.edu	Neurosurgery
Dr. Jonathan Alder	(412) 692-2118	jalder@pitt.edu	Medicine/CCM
Dr. Sameer Agnihotri	(412) 692-9233	sameer.agnihotri@pitt.edu	Neurosurgery
Dr. Gavin Arteel	(412) 648-4187	gearteel@pitt.edu	Medicine (GI)
Dr. Jason Becker	(412) 383-7054	beckerj@pitt.edu	Medicine (Card)
Dr. Juliane (Arteel) Beier	(412) 648-9115	jibeier@pitt.edu	Medicine (GI)
Dr. Kambez Benam	(412) 383-4766	benamk@upmc.edu	Medicine/CCM
Dr. Bharat Bhushan	(412) 648-1189	bhb14@pitt.edu	Pathology
Dr. Timothy Billiar	(412) 647-1749	billiartr@upmc.edu	Surgery
Dr. Harry Blair	(412) 383-9616	hcblair@pitt.edu	Pathology
Dr. Irina Bochkis	(412) 648-1039	bochkisi@pitt.edu	Pathology
Dr. Timothy Burns	(412) 864-7859	burnstf@upmc.edu	Medicine (UPCI)
Dr. Stephen Y. Chan	(412) 692-2935	chansy@pitt.edu	Medicine (VMI)
Dr. Yuan Chang	(412) 623-7716	yc70@pitt.edu	Pathology/UPCI
Dr. Yu-Chih Chen	(412) 623-7701	cheny25@upmc.edu	Comp Biol
Dr. Charleen Chu	(412) 647-3744	ctc4@pitt.edu	Pathology
Dr. Lan Coffman	(412) 641-2016	coffmanl@upmc.edu	Medicine/MWRI
Dr. Christopher Cunningham	(412) 647-2018	cunningc@pitt.edu	Otolaryngology
Dr. Marie DeFrances	(412) 647-9505	defrancesmc@upmc.edu	Pathology
Dr. Evan Delgado	(845) 800-0079	evd7@pitt.edu	Pathology
Dr. Steven Dobrowolski	(412) 692-9874	dobrowolskis@upmc.edu	Pathology (Child)
Dr. H. Henry Dong	(412) 692 6324	dongh@pitt.edu	Pediatrics (Child)
Dr. Chris Donnelly	(412) 383-8983	chrisdonnelly@pitt.edu	Neurobiology
Dr. Andrew Duncan	(412) 624-5302	duncana@pitt.edu	Pathology
Dr. Mo Ebrahimkhani	(412) 648-1038	mo.ebr@pitt.edu	Pathology
Dr. Toren Finkel	(412) 383-4409	finkelt@pitt.edu	Medicine (AI)
Dr. Zachary Freyberg	(412) 648-0033	freyberg@pitt.edu	Psychiatry
Dr. David Gau	(610) 883-0348	dave.gau@pitt.edu	Pathology
Dr. Subhadip Ghatak	(614) 906-4612	ghataks@pitt.edu	Surgery (MIRM)
Dr. George Gittes	(412) 692-7291	George.Gittes@chp.edu	Surgery (Child)
Dr. Delphine Gomez	(412) 383-3260	gomezd@pitt.edu	Medicine (VMI)
Dr. Sarah Hainer	(412) 624-6164	sarah.hainer@pitt.edu	Biol. Sci.
Dr. Baoli Hu	(412) 647-0965	baoli@pitt.edu	Neurosurgery
Dr. George Hussey	(412) 624-5272	gsh8@pitt.edu	Pathology/MIRM
Dr. Hun-Way Hwang	(412) 624-7300	Hunway.Hwang@pitt.edu	Pathology
Dr. Smita Iyer	(412) 624-4444	siyer.3@pitt.edu	Pathology
Dr. Brett Kaufman	(412) 383-6031	bkauf@pitt.edu	Medicine (VMI)
Dr. Erin Kershaw	(412) 648-9770	kershawe@pitt.edu	Medicine (Endo)
Dr. Corrine Kliment	(412) 692-2210	ckliment@pitt.edu	Medicine/CCM
Dr. Sungjin Ko	(412) 648-0256	sungjin4@pitt.edu	Pathology
Dr. Melanie Koenigshoff	(412) 624-8209	koenigshoffm@upmc.edu	Medicine/CCM
Dr. Julia Kofler	(412) 624-6353	koflerjk@upmc.edu	Pathology
Dr. Alison Kohan	(412) 648-8630	akohan@pitt.edu	Medicine (Endo)
Dr. Gary Kohanbush	(412) 692-9456	gary.kohanbush2@chp.edu	Neur. Sur (Child)
Dr. Robert Lafyatis	(412) 383-9054	lafyatis@pitt.edu	Medicine
Dr. Eric Lagasse	(412) 235-5147	lagasse@pitt.edu	Pathology/MIRM
Dr. Gang Li	(412) 383-3429	lig@pitt.edu	Medicine (AI)
Dr. Hang Lin	(412) 624-5503	hal46@pitt.edu	Ortho Surg (BSP)
Dr. Silvia Liu	(412) 648-4288	shl96@pitt.edu	Pharm and CB
Dr. Marcus Malek	(412) 692-5123	marcus.malek@chp.edu	Surgery
Dr. Wendy M. Mars	(412) 648-9690	wmars@pitt.edu	Pathology
Dr. George K. Michalopoulos	(412) 648-1040	michalopoulosgk@upmc.edu	Pathology

Dr. Mark Miedel	(412) 648-9200	mmiedel@pitt.edu	Pathology
Dr. Pamela Moalli	(412) 641-6052	pmoalli@mail.magee.edu	Ob/Gyn (Magee)
Dr. Satdarshan (Paul) Monga	(412) 648-9966	smonga@pitt.edu	Pharm CB
Dr. Michael Morowitz	(412) 692-5976	michael.morowitz@chp.edu	Pediatrics
Dr. Mousumi Moulik	(412) 692-6411	mousumi.moulik@chp.edu	Pediatrics
Dr. Benjamin Nacev	(412) 623-7776	nacevba@upmc.edu	Medicine (UPCI)
Dr. Jessie Nedrow	(509) 339-3695	nedrowj@upmc.edu	Radiology (UPCI)
Dr. Kari Nejak-Bowen	(412) 648-8793	knnst5@pitt.edu	Pharm and CB
Dr. Michael Oertel	(412) 648-9727	mio19@pitt.edu	Pharm and CB
Dr. Steffi Oesterreich	(412) 641-8555	oesterreichs@upmc.edu	Pharm and CB
Dr. Tim Oury	(412) 648-9659	tdoury@pitt.edu	Pathology
Dr. Ivona (Vasile) Pandrea	(412) 624-3242	pandrea@pitt.edu	Pathology
Dr. Andrey Parkhitko	(339) 368-4594	aparkhitko@pitt.edu	Medicine (AI)
Dr. Julie Phillippi	(412) 624-6704	phillippija@upmc.edu	Surgery/MIRM
Dr. Reben Raeman	(412) 648-2021	reben.raeman@pitt.edu	Pharm and CB
Dr. Hooman Rashidi	(916) 618-9350	rashidihh@upmc.edu	Pathology
Dr. Babak Razani	(412) 648-7496	brazani@pitt.edu	Medicine (VMI)
Dr. Jeremy Rich	(412) 623-3364	richjn@upmc.edu	Neurology/UPCI
Dr. Iain Scott	(412) 692-2935	scotti2@upmc.edu	Medicine (VMI)
Dr. Melanie Scott	(412) 647-5806	scotmx@upmc.edu	Surgery
Dr. Daniel Shiwerski	(412) 624-9051	djs87@pitt.edu	BioE (VMI)
Dr. Ian Sigal	(412) 864-2220	sigalia@upmc.edu	Ophthalmology
Dr. Kanhaiya Singh	(614) 620-6801	singhk@pitt.edu	Surgery (MIRM)
Dr. T. Rinda Soong	(412) 641-3347	rsoong@pitt.edu	Pathology
Dr. Alejandro Soto-Gutierrez	(412) 648-0064	alexsotoguti@gmail.com	Pathology
Dr. Cynthia St. Hilaire	(412) 692-2935	sthilaire@pitt.edu	Medicine (VMI)
Dr. Roderick Tan	(412) 648-9040	tanrj@upmc.edu	Medicine (Renal)
Dr. Sina Tavakoli	(412) 647-7288	sit23@pitt.edu	Radiology
Dr. Dario Vignali	(412) 624-7935	dvignali@pitt.edu	Immunology
Dr. Flordeliza Villanueva	(412) 647-5840	villanuevafs@upmc.edu	Medicine (VMI)
Dr. Nam Vo	(412) 648-1092	von@upmc.edu	Ortho Surg
Dr. Jing Hong Wang	(412) 864-7728	jhw51@pitt.edu	Hem/Onc/UPCI
Dr. Qingde Wang	(412) 648-9995	wangq2@upmc.edu	Surgery
Dr. Alan Wells	(412) 647-7813	wellsa@upmc.edu	Pathology
Dr. Haodi Wu	(412) 383-7054	haodi@pitt.edu	Medicine (VMI)
Dr. Vijay Yechoor	(412) 383-4251	yechoorv@pitt.edu	Medicine
Dr. Lianghui (Lucy) Zhang	(412) 864-5483	lhzhang@pitt.edu	Medicine (VMI*)
Auxiliary (Adjunct, Part Time, Emeritus, etc.):			
Dr. Stephen Badylak	(412) 235-5145	badylaks@upmc.edu	Surgery/MIRM
Dr. Yaacov Barak	(412) 641-8557	baraky@mwri.magee.edu	Ob/Gyn (Mag)
Dr. Michael Becich	(412) 623-3941	becich@pitt.edu	Bioinformatics
Dr. Aaron Bell	(412) 624-3507	bellaaro@pitt.edu	Pharm and CB
Dr. Sarah Berman	(412) 383-5868	bermans@upmc.edu	Neurology
Dr. Bryan Brown	(412) 624-5273	brownb@upmc.edu	Bioengineering
Dr. Ronald Buckanovich	(412) 641-4271	buckanovichrj@mwri.magee.edu	Medicine
Dr. Anne-Ruxandra Carvunis	(412) 648-3335	anc201@pitt.edu	Comp Biol
Dr. Anthony Demetris	(412) 624-6645	demetrisaj@upmc.edu	Pathology
Dr. Ira J. Fox	(412) 692-6693	foxi@upmc.edu	Surgery (Child)
Dr. Samira Kiani	(412) 383-9594	samira.kiani@pitt.edu	Pathology
Dr. John Kirkwood	(412) 623-7707	kirkwoodjm@upmc.edu	Medicine (UPCI)
Dr. Scott Kulich	(412) 688-6549	kulichsm@upmc.edu	Pathology
Dr. Joseph Locker	(412) 648-9701	lockerj@upmc.edu	Pathology
Dr. Anna Lokshin	(412) 623-7706	loksax@upmc.edu	Medicine/UPCI
Dr. Peter Lucas	(412) 692-6218	lucaspc@upmc.edu	Pathology (Adj)
Dr. Jianhua Luo	(412) 648-8791	luoj@upmc.edu	Pathology
Dr. Kacey Marra	(412) 383-3924	marrkx@upmc.edu	Surgery

Dr. Yuri Nikiforov	(412) 802-6797	nikiforovye@upmc.edu	Pathology
Dr. Donna B. Stolz	(412) 383-7283	dstolz@pitt.edu	Cell Biology
Dr. Kenichi Tamama	(412) 648-9485	tamamakj@upmc.edu	Pathology
Dr. Angus Thomson	(412) 624-1116	thomsonaw@upmc.edu	Surgery
Dr. Thanos Tzounopoulos	(412) 383-8626	thanos@pitt.edu	Otolaryngology
Dr. Yoram Vodovotz	(412) 647-6067	vodovotzy@upmc.edu	Surgery
Dr. David Vorp	(412) 235-5136	vorpda@upmc.edu	Bioengineering
Dr. Xiaosong Wang	(412) 623-1587	wangx13@pitt.edu	Path/UPCI
Dr. Zhou Wang	(412) 623-3903	wangz2@upmc.edu	Urology/UPCI
Dr. Sally (Morganroth) Wenzel	(412) 692 2210	swenzel@pitt.edu	SPH/EOH
Dr. Clayton Wiley	(412) 624-0764	wiley1@pitt.edu	Pathology (Emer)
Dr. Cary Wu	(412) 648-2350	carywu@pitt.edu	Pathology
Dr. Yi Xuan	(412) 648-7330	xuan.nano@pitt.edu	Surgery
Dr. Jian Yu	(412) 623-7786	yuj2@upmc.edu	Pathology (Adj)
Dr. Reza Zarnegar	(412) 648-8657	rezazar@pitt.edu	Pathology
Dr. Yingze Zhang	(412) 692-2306	zhangy@upmc.edu	Medicine

14. CURRENT CMP STUDENTS (and their mentors) as of 11/1/24

Ibrahim Ahmed	iba15@pitt.edu	Delphine Gomez
Anu Balogun	olb25@pitt.edu	Kari Nejak-Bowen
Rithika Behera	rithika.behera@pitt.edu	Robert Lafyatis
Yu Bian	yub28@pitt.edu	Bokai Zhu
Mona Chatrizeh	moc28@pitt.edu	Michael Morowitz
Yu-Wei (Winnie) Cheng	yuc186@pitt.edu	Toren Finkel
Brian Chew	bjc121@pitt.edu	Brett Kaufman
Tony Chiang	chc396@pitt.edu	Kari Nejak-Bowen
Carlos Cosme	cac460@pitt.edu	Babak Razani
Andrea Cruz	anc232@pitt.edu	Sameer Agnihotri
Ava Dou	yid62@pitt.edu	Dario Vignali
Salma El-Mossier	soe33@pitt.edu	George Hussey
Taylor Gatesman	tag85@pitt.edu	Sameer Agnihotri
Shohini Ghosh-Choudhary	skg46@pitt.edu	Toren Finkel
Matthew Halbert	meh237@pitt.edu	Sameer Agnihotri
Eileen Huang	eih18@pitt.edu	Melanie Koenigshoff
Alice Jiang	sij38@pitt.edu	Steve Chan
Dana Julian	drj21@pitt.edu	Julia Kofler
Yekaterina Krutsenko	yek14@pitt.edu	Paul Monga
Brandon Lehrich	brandon.lehrich@pitt.edu	Paul Monga
Jack Little	little.jack@medstudent.pitt.edu	Peter Lucas
Jie Bin Liu	liu.jiebin@medschool.pitt.edu	Steffi Oesterreich
Zhenghao Liu	zh1311@pitt.edu	Alex Soto-Gutierrez
Varun Mandi	varunmandi@pitt.edu	Vijay Yechoor
Ugonna Mbackwe	ugm1@pitt.edu	Corrine Kliment
Chris Merkel	chm323@pitt.edu	Steffi Oesterreich
Joud Mulla	jom219@pitt.edu	Melanie Scott
Stephanie Podguski	stp122@pitt.edu	Corrine Kliment
Zana Ross	zmr9@pitt.edu	Erin Kershaw
Kienan Salvatore	kis111@pitt.edu	Lucy Zhang
Justin Sui	jus104@pitt.edu	Corinne Kliment
Claudia Sun	yas95@pitt.edu	Dario Vignali
Swathi Suresh	sws80@pitt.edu	Lan Coffman
Kristin Wannemo	krw120@pitt.edu	Melanie Koenigshoff
Gillian Williams	giw10@pitt.edu	Bharat Bhushan
Sierra Wilson	siw40@pitt.edu	Andy Duncan
Jiazhen Xu	jix104@pitt.edu	Chris Donnelly
Tina Yang	jiy201@pitt.edu	Zach Freyberg
Tyler Yasaka	tyy4@pitt.edu	Paul Monga
Hsuan Yeh	hsy15@pitt.edu	Henry Dong

15. RECENT CMP GRADUATES (and their mentors)

2023-2024

Hannah Crentsil	heb62@pitt.edu	Peter Lucas
Gabby Gilmer	gabbygilmer@pitt.edu	Fabrisia Ambrosio
Susannah Waxman	suw31@pitt.edu	Ian Sigal
Grace Conway	gec36@pitt.edu	Liza Villanueva
Maria Beecher	mlb207@pitt.edu	Peter Lucas
Bill Tennant	wmt7@pitt.edu	Chris Donnelly
Ryan LeGraw	ryl17@pitt.edu	Mo Ebrahimkhani
Rick van der Geest	riv13@pitt.edu	Janet Lee

2022-2023

Philip Mannes
Nicole Martucci

pzm2@pitt.edu
njm97@pitt.edu

Sina Tavakoli
George Michalopoulos

2021-2022

Kyle Sylakowski
Rebecca Kritschil
Mark Murdock
Raphael Crum
Sam Herron
Mingjun Liu
Jeremy Velazquez*
Meghan Mooring

kys13@pitt.edu
rak148@pitt.edu
mhm35@pitt.edu
rjc105@pitt.edu
rsh35@pitt.edu
mil128@pitt.edu
jev50@pitt.edu
msm127@pitt.edu

Alan Wells
Nam Vo
Steve Badylak
Steve Badylak
Hun-way Hwang
Delphine Gomez
Mo Ebrahimkhani
Dean Yimlamai

2020-2021

Drew Bradshaw
Karis Kosar
Laura Molina*
Tianmeng Chen
Anthony Otero*

anb199@pitt.edu
kpk21@pitt.edu
lmm208@pitt.edu
tic37@pitt.edu
pao19@pitt.edu

Alan Wells
Kari Nejak-Bowen
Paul Monga
Tim Billiar
Charleen Chu

2019-2020

La Li
Tiffany Bernardo
Tolani Olonisakin*
Heejae Kang
Miranda Culley
Mason Donnell

lal92@pitt.edu
tmb94@pitt.edu
tfo5@pitt.edu
hek43@pitt.edu
mkc53@pitt.edu
mld140@pitt.edu

Rocky Tuan
Yaki Barak
Janet Lee
Peter Lucas
Steve Chan
Tim Oury

2018-2019

Jia-Ying (Lloyd) Lee
Abby Stahl
Alicia Watson
Prashanti Patil
Kevin Levine
Jackie Russell
Patrick Wilkinson

jil87@pitt.edu
ecs40@pitt.edu
alw128@pitt.edu
prp32@pitt.edu
kml116@pitt.edu
jor76@pitt.edu
pdw14@pitt.edu

Peter Lucas
Bryan Brown
Angus Thomson
Nam Vo
Steffi Oesterreich
Paul Monga
Andy Duncan

2017-2018

Ahmad Khazali
Tianyu He
Morgan Preziosi
Matthew Wexler (MS)
Colin Beckwitt

ahk28@pitt.edu
tih19@pitt.edu
mep116@pitt.edu
maw266@pitt.edu
chb106@pitt.edu

Alan Wells
Ivona Pandrea
Paul Monga
Xiaosong Wang
Alan Wells

2016-2017

Jennie Vorhauer (MS)
J. Randall McAuley
Alex Kikuchi
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