University of Pittsburgh

Cellular & Molecular Pathology GRADUATE PROGRAM

2026 – 2027

# CMP
# Student Handbook

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

The Student Handbook is not meant to be a complete summary of all University or Department of Pathology policies, procedures, and academic regulations. The information in the Handbook can change at any time, with or without notice. It does not constitute a contract between the University of Pittsburgh and its students. The information here overrides what was published in previous Handbooks.

*Updated: November 16, 2026*

## CMP Graduate Program Leadership

**Directors**

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**Useful links and contacts:**

- Department of Pathology website
- Office of the Learning Environment website
- Office of the Provost website
- Office of Graduate Studies in the School of Medicine website
- Office of Academic Career Development website
- Pitt post-doctoral positions website
- University of Pittsburgh Health Sciences website

## Table of Contents


**1. Overall Objectives & Guidelines ..... page 5**

**2. Purpose of this Handbook ..... page 5**
- 2.1 Changes to the Handbook ..... 6
- 2.2 Using this Handbook ..... 6

**3. Program Leadership & Advisors ..... page 6**
- 3.1 Program Directors of the CMP Graduate Program ..... 6
- 3.2 Administrative Staff ..... 7
- 3.3 CMP Executive Committee ..... 7
- 3.4 Major Advisor (Mentor) ..... 7

**4. Curriculum & Degree Requirements ..... page 8**
- 4.1 IBGP Students in the CMP Program ..... 9
  - 4.1a IBGP First Year (Before Entering CMP)
  - 4.1b Coursework
  - 4.1c Comprehensive Examination
  - 4.1d Dissertation Research
  - 4.1e Degree Completion
- 4.2 MSTP (MD/PhD) Students in the CMP Program ..... 12
  - 4.2a Coursework
  - 4.2b Comprehensive Examination
  - 4.2c Dissertation Research
  - 4.2d Degree Completion
- 4.3 Credit Requirements ..... 14

**5. Components of the Plan of Study for All CMP Students ..... page 15**
- 5.1 Academic Policies, Procedures, & Registration ..... 15
  - 5.1a Academic Policies & Procedures
  - 5.1b Course Registration
- 5.2 Coursework Expectations ..... 16
- 5.3 Electives & Tutorials ..... 16
- 5.4 CMP Research Seminar ..... 17
- 5.5 Departmental Seminar Series ..... 17
- 5.6 Biostatistics ..... 17
- 5.7 Research Ethics & Professionalism ..... 17
- 5.8 Grant Writing ..... 18
- 5.9 Research in Progress (RIP) ..... 18
- 5.10 Professional Development ..... 18

**6. Course Descriptions ..... page 18**

**7. Assessment of Graduate Students ..... page 22**
- 7.1 Annual Academic Assessment ..... 22
- 7.2 Student Worker Evaluation for Graduate Student Researchers ..... 23
- 7.3 Program Probation & Dismissal ..... 23
- 7.4 University Probation ..... 24
- 7.5 Terminal Master's Degree ..... 24

**8. Special Circumstances ..... page 25**
- 8.1 Leaves of Absence ..... 25
- 8.2 Short Break Policy ..... 25
- 8.3 Attendance at Scientific Meetings ..... 25
- 8.4 Disability Accommodation ..... 25

**9. Milestones ..... page 26**
9.1 Preliminary Examination ..... 26
9.2 Comprehensive Examination ..... 26
9.2a Committee
9.2b Written Examination
9.2c Oral Examination
9.2d Evaluation
9.3 Dissertation ..... 29
9.3a Doctoral Dissertation Advisory & Final Examination Committee
9.3b Dissertation Overview (Prospectus Meeting) & Admission to Candidacy
9.3c Dissertation Committee Meeting
9.3d Written Dissertation
9.3e Application for Graduation
9.3f Announcement of Dissertation Defense
9.3g Final Oral Examination
9.4 Final Graduation Steps ..... 32
9.5 Major Program Milestones Summary ..... 33

**10. Financial Support & Appointments ..... page 33**
10.1 Appointments and Support ..... 33
10.2 Externship Opportunities ..... 34

**11. Policies, Resources, & Resolving Concerns ..... page 34**
11.1 Policies & Resources ..... 34
11.2 Resolving Concerns ..... 35

**12. CMP Graduate Training Faculty ..... page 36**

**13. Current CMP Students & Their Mentors ..... page 39**

**14. CMP Alumni ..... page 41**

## 1. Overall Objectives & Guidelines

The Cellular & Molecular Pathology (CMP) Graduate Program at the University of Pittsburgh is designed to achieve several objectives:

- To prepare students for careers as independent investigators.
- To develop competence in conducting laboratory research, including the ability to design, execute, analyze, report, and defend original research.
- To develop broad knowledge of the core disciplines of pathology while fostering expertise in one or more specialized areas, including neuropathology, liver biology and disease, lung biology and disease, vascular biology, cancer biology, regenerative medicine, translational medicine, and immunopathology.
- To develop professional skills in oral and written scientific communication, including critical evaluation of the primary literature, scientific presentations, grant writing, and teaching.

In designing the graduate training program, the faculty has been guided by several fundamental principles. First, the CMP Graduate Training Faculty and each student's Major Advisor (mentor) work together to develop an individualized training plan that reflects the student's background, interests, and career goals. Second, research serves as the foundation of graduate training and should begin as early as possible rather than be delayed by coursework that does not meaningfully contribute to the student's development as an independent investigator. Third, students are evaluated based on the competencies essential for successful independent investigators, including the ability to design, conduct, interpret, and critically evaluate scientific research, both their own and that of others.

Most students complete the Program approximately four years after entering CMP. Accordingly, student progress is assessed primarily on the development of scientific independence, research productivity, and successful completion of program milestones.

Although the CMP Graduate Program does not have a formal publication requirement for graduation, students are expected to develop a strong record of scholarly productivity during their graduate training. As a general guideline, students should strive to publish one to three peer-reviewed manuscripts, including at least one first-author publication. Students are also encouraged to collaborate broadly and contribute to projects that result in co-authored publications. Although publication record is one measure of productivity, the quality, scientific impact, and rigor of the work are often equally important when pursuing postdoctoral positions and other career opportunities.

## 2. Purpose of this Handbook

This Handbook supplements the University of Pittsburgh Regulations Governing Graduate Study and serves as the primary resource for students in the CMP Graduate Program. It outlines the Program's policies, requirements, expectations, and recommended practices. Many aspects of graduate education and student employment are governed by University policies, applicable School of Medicine policies, and collective bargaining agreements. In the event of any conflict between this Handbook and those policies, the applicable University policies, School of Medicine policies, and collective bargaining agreement take precedence.

Questions regarding the CMP Graduate Program or this Handbook should be directed to the Program Director. Although the Program is closely affiliated with the Department of Pathology, it is a stand-alone graduate program within the University of Pittsburgh School of Medicine.

### 2.1: Changes to the Handbook

The Handbook is reviewed and updated annually before the start of each academic year to ensure that students have access to the most current policies and guidance. The Program Director coordinates this process in consultation with CMP faculty, students, and administrative staff.

Students are responsible for consulting the most current version of the Handbook throughout their time in the Program. Annual revisions are generally intended to clarify existing policies and incorporate approved changes rather than substantially alter Program requirements. Major changes to Program policies or academic requirements require approval by a majority vote of the CMP Graduate Training Faculty.

### 2.2: Using this Handbook

This Handbook is intended to serve as a reference throughout a student's graduate training. Although students are encouraged to become familiar with the entire Handbook, many sections are designed to be consulted as needed.

Students entering the CMP Graduate Program are encouraged to begin with Section 4 (Curriculum & Degree Requirements) and Section 9 (Program Milestones) to become familiar with the Program's curriculum, degree requirements, and major academic milestones. Continuing students may find Sections 7–11 particularly useful for information related to annual assessments, Program policies, student support, and University resources.

## 3. Program Leadership & Advisors

Students receive guidance from several individuals throughout their graduate training. The **Major Advisor (mentor)** serves as the student's primary research mentor and provides day-to-day guidance in dissertation research and professional development. The **Program Director** serves as the student's academic advisor and provides guidance on Program requirements, curriculum, and academic progress. After the Comprehensive Examination, the **Dissertation Committee** provides ongoing scientific guidance and evaluates the student's progress toward the PhD.

Throughout their graduate training, students must have a Major Advisor. Within six months of passing the Comprehensive Examination, students must also establish an active Dissertation Committee.

### 3.1: Program Directors of the CMP Graduate Program

The Program Director has primary responsibility for the administration of the CMP Graduate Program. Students with questions regarding Program requirements, coursework, curriculum, milestones, or other academic matters should consult the Program Director. The Program Director's responsibilities include:

- Providing academic advising and oversight throughout each student's graduate training.
- Approving student registration and requests for exceptions to Program requirements, when appropriate.
- Approving the membership of Comprehensive Examination Committees and Dissertation Committees.
- Monitoring student progress toward completion of Program milestones.
- Overseeing Program curriculum, policies, and annual Handbook revisions.

The Program may also include one or more Associate Directors, Co-Directors, or Directors with specific responsibilities. These individuals assist the Director in the administration of the Program and may act on the Director's behalf, as appropriate.

Program leadership positions are appointed by the Chair of the Department of Pathology or the Chief of the Division of Experimental Pathology and approved by a majority vote of the CMP Graduate Training Faculty.

### 3.2: Administrative Staff

Administrative staff assist with the day-to-day administration of the Program. The Graduate Coordinator maintains student records, monitors Program milestones and deadlines, coordinates committee meetings and examinations, and serves as a primary resource for students regarding administrative matters. The Payroll Coordinator assists students with stipend, payroll, and benefits-related questions.

### 3.3: CMP Executive Committee

The CMP Executive Committee provides oversight of the Program and advises the Director on matters related to faculty membership, curriculum, and Program policies. Responsibilities include reviewing requests for faculty affiliation with the Program, evaluating proposed changes to Program requirements, and providing guidance on strategic initiatives. Major changes to Program policies require approval by a majority vote of the CMP Graduate Training Faculty.

The Executive Committee includes:

- CMP Director: Andrew W. Duncan, PhD
- CMP Former Director: Wendy M. Mars, PhD
- Associate Director: *to be determined*
- Director of Curriculum: Rodrigo Florentino, PhD
- Experimental Pathology Division Chief: Alex Soto-Gutierrez, MD, PhD
- Pathology Investigator Residency/Research Training Program (PIRRT) Directors: Charleen Chu, MD, PhD, and Tim Oury, MD, PhD
- CMP Summer Undergraduate Research Program Directors: Amanda Clark, PhD, and Hun-Way Hwang
- CMP representatives on the Interdisciplinary Biomedical Graduate Program (IBGP) Admissions Committee: Chris Alves, PhD, Bharat Bhushan, PhD, George Hussey, PhD, and Delphine Gomez, PhD

### 3.4: Major Advisor (Mentor)

The Major Advisor is the CMP Graduate Training Faculty member whose laboratory serves as the student's primary research environment. The Major Advisor provides scientific mentorship, oversees the student's dissertation research, supports professional development, and helps prepare the student for a career as an independent investigator.

Before joining a laboratory, students and prospective Major Advisors are encouraged to discuss their mutual expectations regarding mentorship, communication, research productivity, and professional development. The AAMC Compact Between Biomedical Graduate Students and Their Research Advisors provides a useful framework for these conversations and is included as part of the laboratory transfer agreement. Students and Major Advisors are encouraged to review and discuss the Compact before the student joins the laboratory.

Students should recognize that faculty members have different mentoring styles and expectations. Choosing a laboratory with a mentoring approach that aligns with the student's learning style, career goals, and professional needs is an important factor in long-term success. New students are encouraged to seek perspectives from more senior students when evaluating potential laboratories and mentors.

## 4. Curriculum & Degree Requirements

This section describes the curriculum, research training, and academic milestones for students in the CMP Graduate Program. Students enter CMP through one of two pathways within the University of Pittsburgh School of Medicine:

- **Interdisciplinary Biomedical Graduate Program (IBGP):** Students complete the common first-year IBGP curriculum before joining CMP for advanced coursework and dissertation research.
- **Medical Scientist Training Program (MSTP):** MD/PhD students enter CMP after completing the preclinical phase of the medical curriculum and follow a modified curriculum designed to integrate PhD training with their medical education.

Although the specific coursework differs between these pathways, all CMP students are expected to complete the academic milestones described throughout this handbook, including coursework, research training, committee meetings, the Comprehensive Examination, dissertation research, and the dissertation defense. A calendar of major program deadlines is provided in Section 9.5.

The Program Director must approve any deviations from the standard curriculum or milestone schedule. For students transferring into CMP from another graduate program, the Program Director will determine whether previously completed coursework satisfies CMP degree requirements.

### 4.1: IBGP Students in the CMP Program

Most students enter the CMP Graduate Program through the IBGP. During the first year of graduate study, IBGP students complete a common interdisciplinary curriculum that provides foundational training in the biomedical sciences, laboratory research, and professional development while exploring potential dissertation laboratories through research rotations.

After successfully completing the first-year IBGP requirements, students select a dissertation laboratory and join one of the participating graduate programs, including CMP, where they complete advanced coursework and dissertation research. Because IBGP requirements and course offerings may change over time, students should consult the current IBGP Handbook for the most up-to-date information regarding first-year curriculum requirements and policies.

### *4.1a: IBGP First Year (Before Entering CMP)*

Students planning to join the CMP Graduate Program first complete the common IBGP curriculum before entering CMP. During this year, students complete foundational coursework, three laboratory research rotations, select a dissertation laboratory, and complete the IBGP Preliminary Examination (Section 9.1).

Although the fall and summer curricula are largely prescribed by IBGP, students have greater flexibility during the spring term to select elective courses. Students intending to join CMP are strongly encouraged to complete Molecular Mechanisms of Tissue Growth & Differentiation (MSCMP 2730) during the spring term of the first year. Taking this required CMP course before entering the program provides greater flexibility in subsequent years for additional electives and research.

**Typical First-Year IBGP Curriculum**

*Students should consult the current IBGP Handbook for the most up-to-date curriculum requirements and policies*.

| **Typical IBGP Year 1 Curriculum** | |
|---|---|
| **Fall Term** | |
| INTBP 2000 Foundations of Biomedical Science | 6 credits |
| INTBP 2005 Foundations Journal Club | 2 credits |
| MSCMP 2280 Basics of Professionalism in Graduate Education | 1 credit |
| INTBP 2010 Laboratory Research Rotation 1 | 3 credits |
| | *12 total credits* |
| **Spring Term** | |
| MSCMP 2730 Molecular Mechanisms of Tissue Growth & Differentiation (recommended for future CMP students) or Elective | 3 credits |
| Elective | 3 credits |
| INTBP 2010 Laboratory Research Rotation 2 | 3 credits |
| | *9 total credits* |
| **Summer Term** | |
| INTBP 2013 Biostatistics | 3 credits |
| INTBP 2290 Scientific Ethics & Responsible Conduct of Research | 1 credit |
| INTBP 2010 Laboratory Research Rotation 3 | 3 credits |
| | *10 total credits* |

### *4.1b: Coursework*

After joining a dissertation laboratory and matriculating into CMP, students complete advanced coursework while devoting increasing effort to their dissertation research. Most required coursework is completed by the end of the second year of graduate study.

**CMP Coursework Requirements (IBGP students)**

- **Required course:** Students must complete Molecular Mechanisms of Tissue Growth & Differentiation (MSCMP 2730, 3 Credits) by the end of the second year.

- **CMP core elective:** Students must complete one of the following CMP core electives:
  - Cancer Biology and Therapeutics (MSCMP 3710, 3 credits, Fall)

- Molecular Pathobiology (MSCMP 2740, 3 credits, Spring)
- Basics of Personalized Medicine (MSCMP 3790, 3 credits, Fall).

The first two courses emphasize research in Anatomical Pathology, whereas the latter emphasizes research in Laboratory Medicine.

- **Additional electives:** Students must complete <u>two</u> elective courses. Approved CMP electives are listed below. With approval from the Director, students may also take graduate-level elective courses offered by other University of Pittsburgh programs that are relevant to their dissertation research.
  - Cancer Biology and Therapeutics (MSCMP 3710, 3 credits, Fall)
  - ECM in Tissue Biology (MSCMP 3735, 3 credits, Fall)
  - Basics of Personalized Medicine (MSCMP 3790, 3 credits, Fall)
  - Molecular Pathobiology (MSCMP 2740, 3 credits, Spring)
  - Intro to Tissue Engineering (MSCMP 2760, 3 credits, Spring)
  - Biomaterials and Biocompatibility (MSCMP 2770, 3 credits, Spring)
  - Stem Cells (MSCMP 3740, 3 credits, Spring)
  - Angiogenesis (MSCMP 3750, 3 credits, Spring)
  - Cell Therapy (MSCMP 3770, 3 credits, Spring)

- **CMP Research Seminar:** Students must enroll in CMP Research Seminar (MSCMP 2750), or an approved substitute, for a minimum of five academic terms (fall and spring). Students may be excused during the term in which they defend their dissertation (Section 5.4).

- **Research in Progress (RIP):** Students are expected to attend the monthly RIP series throughout their graduate studies (Section 5.9).

- **Research credits:** During the first year to year and a half in CMP, research effort is recorded as Directed Study (MSCMP 2790) during the fall and spring terms and counts toward course credits (Section 4.3). During the summer, students enroll in Summer Milestone Study (SMSS 3666, 0 Credits) and are considered full-time students. After successfully completing the comprehensive examination and first committee meeting, students enroll in PhD Dissertation Research (MSCMP 3700). Once 40 credits of PhD Dissertation Research have been earned, students enroll in Full-time Dissertation Study (FTDS 0000, 0 credits). Students enrolled in FTDS continue to be considered full-time students.

**Typical Curriculum for IBGP Students in CMP (First Two Years)**
*This schedule assumes the student completed two elective courses during the spring term of the IBGP first year.*

| Year 1 in CMP (IBGP Year 2) | |
|---|---|
| MSCMP 2750 Research Seminar | 1 credit |
| CMP Core Elective (selected by student) | 3 credits |
| INTBP 3240 Grant Writing | 2 credits |
| MSCMP 2790 Directed Study | 9 credits |
| Research in Progress (RIP) | 0 credits |
| | *15 total credits* |
| **Spring Term** | |
| MSCMP 2750 Research Seminar | 1 credit |
| MSCMP 2730 Molecular Mechanisms of Tissue Growth & Differentiation (if not completed during the IBGP first year) or Elective | 3 credits |
| MSCMP 2790 Directed Study | 9 credits |
| Research in Progress (RIP) | 0 credits |
| | *14 total credits* |
| **Summer Term** | |
| SMSS 3666 Summer Milestone Study | 0 credits |

| Year 2 in CMP (IBGP Year 3) | |
|---|---|
| **Fall Term** | |
| MSCMP 2750 Research Seminar | 1 credit |
| MSCMP 2790 Directed Study or<br>MSCMP 3700 PhD Dissertation Research (depending on the timing of PhD candidacy entry) | 9 credits or<br>14 credits |
| Research in Progress (RIP) | 0 credits |
| | *10 or 15 total credits* |
| **Spring Term** | |
| MSCMP 2750 Research Seminar | 1 credit |
| MSCMP 3700 PhD Dissertation Research | 14 credits |
| Research in Progress (RIP) | 0 credits |
| | *15 total credits* |
| **Summer Term** | |
| MSCMP 3700 PhD Dissertation Research | 3-14 credits |

Following admission to candidacy, students continue to enroll in PhD Dissertation Research (MSCMP 3700) until completing the required 40 dissertation credits, after which they enroll in Full-time Dissertation Study (FTDS 0000) until graduation. Students also continue to enroll in CMP Research Seminar until the five-term requirement has been satisfied and attend the monthly RIP series throughout their graduate studies.

### ***4.1c: Comprehensive Examination***

Students are expected to complete the Comprehensive Examination within 12 months of joining their dissertation laboratory, although they may be granted up to 16 months with the Program Director's approval. Additional information regarding the examination, including procedures for requesting an extension, is provided in Section 9.2. **Implementation Note:** Beginning with students entering the CMP Graduate Program on or after September 1, 2027, the Comprehensive Examination must be completed within 12 months of joining their dissertation laboratory.

Following successful completion of the Comprehensive Examination, students should convene a second committee meeting and submit the Application for Admission to Candidacy within six months to remain on track for timely degree completion.

Students must notify the Graduate Coordinator in advance of all committee meetings so that the appropriate paperwork can be prepared. The Graduate Coordinator is also available to assist with scheduling meeting rooms.

### *4.1d: Dissertation Research*

Following admission to candidacy, students devote the majority of their effort to dissertation research while completing any remaining coursework requirements. Students must meet with their Dissertation Committee at least every six months to review research progress and establish goals for the next phase of training. University policy requires completion of at least 40 credits of PhD Dissertation Research (MSCMP 3700) before enrolling in Full-time Dissertation Study (FTDS 0000).

### *4.1e: Degree Completion*

Students are awarded the PhD upon successfully defending their dissertation and satisfying all University and CMP degree requirements. The final steps required for graduation are outlined in Sections 9.3 and 9.4.

## 4.2: MSTP (MD/PhD) Students in the CMP Program

Students in the Medical Scientist Training Program (MSTP; MD/PhD) follow the same Program milestones and degree requirements as other students in the CMP Graduate Program, with modifications to the coursework requirements to accommodate the MSTP curriculum. MSTP students complete one required CMP course, three electives, the CMP Research Seminar, and the Research in Progress (RIP) series. These modifications allow most MSTP students to complete the PhD phase of their training within four years.

### *4.2a: Coursework*

MSTP students enter the CMP Graduate Program and complete their required and elective coursework while conducting dissertation research. Required coursework is typically completed within approximately 18 months of joining the Program, allowing students to devote the majority of their time to their dissertation research.

**CMP Coursework Requirements (MSTP students)**

- **Required course:** Students must complete one of the following courses:
  - Molecular Mechanisms of Tissue Growth & Differentiation (MSCMP 2730, 3 Credits, Spring)
  - Basics of Personalized Medicine (MSCMP 3790, 3 Credits, Fall)

- **Electives:** Students must complete three elective courses. Approved CMP electives are listed below. With approval from the Director, students may also take graduate-level elective courses offered by other University of Pittsburgh programs that are relevant to their dissertation research.
  - Molecular Mechanisms of Tissue Growth & Differentiation (MSCMP 2730, 3 credits, Spring)
  - Molecular Pathobiology (MSCMP 2740, 3 credits, Spring)
  - Intro to Tissue Engineering (MSCMP 2760, 3 credits, Spring)
  - Biomaterials and Biocompatibility (MSCMP 2770, 3 credits, Spring)
  - Stem Cells (MSCMP 3740, 3 credits, Spring)
  - Angiogenesis (MSCMP 3750, 3 credits, Spring)
  - Cell Therapy (MSCMP 3770, 3 credits, Spring)

    - Cancer Biology and Therapeutics (MSCMP 3710, 3 credits, Fall)
    - ECM in Tissue Biology (MSCMP 3735, 3 credits, Fall)
    - Basics of Personalized Medicine (MSCMP 3790, 3 credits, Fall)

- **CMP Research Seminar:** Students must enroll in CMP Research Seminar (MSCMP 2750), or an approved substitute, for a minimum of five academic terms (fall and spring). Students may be excused during the term in which they defend their dissertation (Section 5.4).

- **Research in Progress (RIP):** Students are expected to attend the monthly RIP series throughout their graduate studies (Section 5.9).

- **Research credits:** During the first year to year and a half in CMP, research effort is recorded as Directed Study (MSCMP 2790) during the fall and spring terms and counts toward course credits (Section 4.3). During the summer, students enroll in Summer Milestone Study (SMSS 3666, 0 Credits) and are considered full-time students. After successfully completing the comprehensive examination and first committee meeting, students enroll in PhD Dissertation Research (MSCMP 3700). Once 40 dissertation credits have been earned, students enroll in Full-time Dissertation Study (FTDS 0000, 0 Credits). Students enrolled in FTDS continue to be considered full-time students.

**Typical Curriculum for MSTP Students in CMP (First Two Years)**

| **Year 1 in CMP (MSTP students)** | |
|---|---|
| **Fall Term** | |
| MSCMP 2750 Research Seminar | 1 credit |
| MSCMP 3790 Basics of Personalized Medicine | 3 credits |
| Elective 1 | 3 credits |
| MSCMP 2790 Directed Study | 8 credits |
| Research in Progress (RIP) | 0 credits |
| | *15 total credits* |
| **Spring Term** | |
| MSCMP 2750 Research Seminar | 1 credit |
| Elective 2 | 3 credits |
| Elective 3 | 3 credits |
| MSCMP 2790 Directed Study | 8 credits |
| Research in Progress (RIP) | 0 credits |
| | *15 total credits* |
| **Summer Term** | |
| SMSS 3666 Summer Milestone Study | 0 credits |

| Year 2 in CMP (MSTP Students) | |
|---|---|
| **Fall Term** | |
| MSCMP 2750 Research Seminar | 1 credit |
| MSCMP 2790 Directed Study or<br>MSCMP 3700 PhD Dissertation Research (depending on the timing of PhD candidacy entry) | 9 credits or<br>14 credits |
| Research in Progress (RIP) | 0 credits |
| | *10 or 15 total credits* |
| **Spring Term** | |
| MSCMP 2750 Research Seminar | 1 credit |
| Research in Progress (RIP) | 0 credits |
| **Summer Term** | |
| MSCMP 3700 PhD Dissertation Research | *3-14 credits* |

Following admission to candidacy, students continue to enroll in PhD Dissertation Research (MSCMP 3700) until completing the required 40 dissertation credits, after which they enroll in Full-time Dissertation Study (FTDS 0000) until graduation. Students also continue to enroll in CMP Research Seminar until the five-term requirement has been satisfied and attend the monthly RIP series throughout their graduate studies.

### *4.2b: Comprehensive Examination*

Students are expected to complete the Comprehensive Examination within 12 months of joining their dissertation laboratory, although they may be granted up to 16 months with the Program Director's approval. Additional information regarding the examination, including procedures for requesting an extension, is provided in Section 9.2. **Implementation Note:** Beginning with students entering the CMP Graduate Program on or after September 1, 2027, the Comprehensive Examination must be completed within 12 months of joining their dissertation laboratory.

Following successful completion of the Comprehensive Examination, students should convene a second committee meeting and submit the Application for Admission to Candidacy within six months to remain on track for timely degree completion.

Students must notify the Graduate Coordinator in advance of all committee meetings so that the appropriate paperwork can be prepared. The Graduate Coordinator is also available to assist with scheduling meeting rooms.

### *4.2c: Dissertation Research*

Following admission to candidacy, students devote the majority of their effort to dissertation research while completing any remaining coursework requirements. Students must meet with their Dissertation Committee at least every six months to review research progress and establish goals for the next phase of training. University policy requires completion of at least 40 credits of PhD Dissertation Research (MSCMP 3700) before enrolling in Full-time Dissertation Study (FTDS 0000).

### *4.2d: Degree Completion*

Students are awarded the PhD upon successfully defending their dissertation and satisfying all University and CMP degree requirements. The final steps required for graduation are outlined in Sections 9.3 and 9.4.

## 4.3: Credit Requirements

Students must complete a minimum of 72 graduate credits to earn the PhD, including 32 course credits and 40 credits of PhD Dissertation Research. University policy also requires at least six terms of full-time graduate study (or the equivalent) before the PhD degree may be awarded.

University of Pittsburgh policies governing transfer credit are described in the University of Pittsburgh Regulations Governing Graduate Study. In general, up to 30 credits from a master's degree awarded by another institution may be accepted toward the University's minimum credit requirement. Students who completed graduate study beyond the master's degree may have up to 12 additional credits accepted toward the minimum credit requirement. With rare exceptions, however, the CMP Graduate Program does not accept external graduate credits toward fulfillment of its required coursework.

With prior approval from the Director and the School of Medicine, students may complete graduate coursework or research experiences at another institution when those opportunities are not available at the University of Pittsburgh. In all cases, at least 36 credits (three terms of full-time study) must be completed at the University of Pittsburgh.

Students must register each academic term for the appropriate number of credits based on coursework, directed study, or dissertation research. Students who do not register for at least one credit within a 12-month period will be placed on inactive status and must apply for readmission before registering again.

## 5. Components of the Plan of Study for All CMP Students

The CMP curriculum is designed to provide students with both broad training in pathology and in-depth expertise in their chosen area of research. In consultation with their Major Advisor and Dissertation Committee, students are encouraged to develop an individualized plan of study that complements their dissertation research while providing a strong foundation in the biomedical sciences.

Graduate training extends beyond formal coursework and includes seminars, tutorials, committee meetings, research presentations, and other professional development activities. Together, these experiences are intended to prepare students for successful careers as independent investigators.

### 5.1: Academic Policies, Procedures, & Registration

#### *5.1a: Academic Policies & Procedures*

Students must maintain a minimum cumulative grade point average (GPA) of 3.0 on a 4.0 scale. Students whose cumulative GPA falls below 3.0 will be placed on academic probation for the following academic term. If the deficiency is not corrected or substantially improved during that term, the student may be dismissed from the Program.

A grade of B or higher is required to pass a CMP core course. A grade of B− (B minus) is not considered passing, even if the student's cumulative GPA remains at or above 3.0. Students who earn a grade below B in a core course must repeat that course and will be placed on academic probation with guidance for returning to good academic standing. The following CMP courses are considered core courses for purposes of grading and academic standing:

**For IBGP students:**

- **Required course:** Molecular Mechanisms of Tissue Growth & Differentiation (MSCMP 2730)

- **CMP core elective:** Students complete one of the following:
    - Cancer Biology and Therapeutics (MSCMP 3710)
    - Molecular Pathobiology (MSCMP 2740)
    - Basics of Personalized Medicine (MSCMP 3790)

**For MSTP students:**

- **Required course:** Students complete one of the following courses:
    - Basics of Personalized Medicine (MSCMP 3790)
    - Molecular Mechanisms of Tissue Growth & Differentiation (MSCMP 2730)

### *5.1b: Course Registration*

Before each academic term, students meet with the Program Director to review their coursework and academic progress. Following this meeting, the Graduate Coordinator will remove the advising hold placed by the Office of the University Registrar, allowing students to complete self-registration. Students are responsible for registering by the University's published registration deadlines.

Full-time registration requires 9–15 credits during the fall and spring terms. During the summer term, students are generally expected to register for 3–14 credits, depending on their stage of training. Students who have not yet been admitted to candidacy should enroll in Summer Milestone Study (SMSS 3666) during the summer term. Following admission to candidacy, students enroll in PhD Dissertation Research (MSCMP 3700) until completing the required 40 credits of PhD Dissertation Research, after which they enroll in Full-time Dissertation Study (FTDS 0000).

## 5.2: Coursework Expectations

Students are expected to attend all scheduled classes, arrive on time, and notify the course instructor in advance whenever possible if a scheduling conflict arises. Students should minimize outside commitments during the academic term, as exceeding the number of permitted unexcused absences may result in a grading penalty.

Coursework requirements for IBGP and MSTP students are described in Section 4. Course descriptions for CMP-sponsored courses are provided in the following sections.

## 5.3: Electives & Tutorials

Elective courses allow students to develop additional expertise related to their dissertation research while fulfilling the University requirement of 32 course credits. With approval from the Director, students may also establish tutorials in specialized areas for which formal courses are not available.

To establish a tutorial, a student (or group of students) identifies a faculty instructor and develops a syllabus that includes the course objectives, content, and method of evaluation. The Program Director must approve the syllabus before the tutorial begins. Approved tutorials are offered as Special Topics (MSCMP 2780) for the appropriate number of course credits.

Tutorials typically focus on advanced study of specialized topics through the critical evaluation of the primary and secondary scientific literature. They may also include training in new laboratory techniques or structured internship experiences relevant to biomedical research.

## 5.4: CMP Research Seminar

Students are required to enroll in CMP Research Seminar (MSCMP 2750) during the fall and spring terms for a minimum of five academic terms. Senior students are encouraged to continue attending the seminar to provide feedback and mentorship to junior students. Students are not required to enroll in the seminar during the term in which they defend their dissertation.

Students select a recent, impactful publication and present or teach the article to the class. Presentations are critiqued by fellow students and faculty, and those that do not meet course expectations must be repeated. Students are expected to read the assigned research article before each seminar and actively participate in the discussion. Active participation is considered an essential component of the CMP Graduate Program.

## 5.5: Departmental Seminar Series

Students are encouraged to attend the Department of Pathology research seminar series and other seminar series relevant to their research interests on a regular basis. These seminars expose students to current advances in biomedical research, provide opportunities to interact with visiting scientists, and broaden their scientific perspective beyond their dissertation research.

## 5.6: Biostatistics

All CMP students must successfully complete a course in biostatistics. IBGP students typically fulfill this requirement by completing Data to Knowledge (INTBP 2013) during the summer following their first year of graduate study. With approval from the Program Director, students may instead complete a more advanced graduate-level biostatistics course. MSTP students satisfy this requirement by completing a comparable biostatistics course through the MSTP curriculum.

## 5.7: Research Ethics & Professionalism

All students are expected to conduct themselves ethically and professionally in all aspects of their research and graduate training. This includes maintaining safe laboratory practices, ensuring the humane care and use of research animals, accurately reporting research findings, appropriately acknowledging the work of others, and avoiding plagiarism. All work submitted to satisfy Program requirements must comply with the University of Pittsburgh Academic Regulations & Guidelines.

Upon entering the Program, students must complete all required University and departmental training related to laboratory safety, research compliance, and the responsible conduct of research. Students are also expected to familiarize themselves with all institutional and federal policies governing the ethical conduct of research that are relevant to their work, including those related to animal research, human subjects research, and research integrity.

All IBGP students complete formal training in research ethics and professionalism during their first year through Professionalism (MSCMP 2280) and Scientific Ethics (INTBP 2290). MSTP students satisfy comparable requirements through the MSTP curriculum.

### 5.8: Grant Writing

All CMP students complete formal training in grant writing before completing their dissertation. IBGP students typically fulfill this requirement by completing Grant Writing (INTBP 3240). MSTP students satisfy this requirement through a comparable grant-writing course offered as part of the MSTP curriculum.

### 5.9: Research in Progress (RIP)

All CMP students are expected to attend the monthly Research in Progress (RIP) series throughout their graduate training. RIP provides an opportunity for students to present their research, receive constructive feedback from faculty and peers, and learn about the research of other members of the Program. Additional topics relevant to graduate training and professional development may also be discussed. Faculty are encouraged to attend and participate in these sessions.

### 5.10: Professional Development

Although not a formal Program requirement, students are strongly encouraged to participate in professional development activities throughout their graduate training. The University of Pittsburgh School of Medicine Office of Graduate Studies offers a variety of resources, workshops, and career development programs, including Career Club, to prepare students for careers in academia, industry, government, and other sectors of the biomedical workforce.

Students are also encouraged to participate in student organizations, including the Biomedical Graduate Student Association (BGSA) and Fourth River Solutions (4RS), which provide opportunities for leadership, networking, outreach, and career exploration. Additional information about professional development opportunities is available through the Office of Graduate Studies.

## 6. Course Descriptions

**MSCMP 2280** Fall 1 credit
**Basic Understanding of Professionalism as Related to Graduate Education**
Students will be introduced to the underpinning concepts of Professionalism 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.

**MSCMP 2700** Fall, Spring, Summer 1-14 credits
**MS Thesis Research**
This is a directed research project that results in a thesis for a master's degree.

**MSCMP 2730** Spring 3 credits

**Molecular Mechanisms of Tissue Growth & Differentiation**

The course examines the anatomy, embryology, histology, physiology, and molecular regulation of tissue growth and differentiation across multiple organ systems, including the central nervous system, auditory system, lung, liver, pancreas, urinary and reproductive systems, breast, endocrine organs, skin, bone, skeletal muscle, and bone marrow. Topics include growth factors, receptors, and signaling pathways that govern tissue development, homeostasis, and repair. Lectures are delivered by faculty from the Departments of Pathology, Cell Biology, Physiology, Medicine, Surgery, and others whose research programs focus on these areas.

**MSCMP 2740** Spring 3 credits

**Molecular Pathobiology**

This course is structured to introduce students to the integration between basic and clinical research on the molecular pathogenesis of highly relevant human diseases such as diabetes, congestive heart failure, bone disease, neurodegenerative disorders and asthma. The course provides students with an overview of the natural history of the 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. We discuss current research trends and factors that enhance fundability of research projects, the current knowledge gaps of the science and impact of therapeutic development.

**MSCMP 2750** Fall, Spring 1 credit

**CMP Research Seminar***

Students critically evaluate and present recent, impactful publications spanning a broad range of topics in cellular and molecular pathology and related biomedical sciences. Each student leads a discussion by presenting a selected research article, with emphasis on critical analysis of experimental design, data interpretation, and scientific communication. Presentations are critiqued by fellow students and faculty to strengthen oral presentation, teaching, and critical thinking skills. Students are expected to read the assigned article before each seminar and actively participate in discussion.

* Developing teaching skills is an important component of graduate education, and CMP Research Seminar gives students an opportunity to build teaching and communication skills by leading discussions of recent scientific publications. Students may elect to get further experience in developing their teaching skills by serving as Course Support Assistants in graduate courses. Students interested in teaching should discuss available opportunities with their Major Advisor and the Program Director.

**MSCMP 2760** Spring 3 credits

**Intro to Tissue Engineering & Regeneration**

The purpose of this course is to introduce students to the fields of tissue engineering and regenerative medicine. 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. Regenerative medicine is a related and overlapping field, focusing on methods that enable the body to heal itself rather than using laboratory made constructs. Tissue engineering and regenerative medicine are highly interdisciplinary and therefore cross 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 and

regenerative medicine, understand techniques utilized to design, fabricate, and functionally assess tissue engineered systems, including human microphysiological systems. Students should be able to apply the combined knowledge of tissue organization, tissue engineering and regenerative medicine strategies to design a unique, reasonable tissue engineered or regenerative solution to an unmet clinical need. This course covers cell and tissue biology, biomaterials, drug delivery, engineering methods and design, and clinical implementation.

**MSCMP 2770** Spring 3 credits
**Biomaterials & Biocompatibility**
Synthesis and properties of polymeric biomaterials; surface modification; surface characterization; biodegradation; metallic biomaterials and corrosion; protein adsorption; cell adhesion; coagulation and thrombosis; complement and the foreign body response; biomaterial-centered infection; sterilization; natural biomaterials.

**MSCMP 2780** Fall, Spring, Summer 3 credits
**Special Topics**
Students focus on a selected topic or internship (most often defined by the student) related to cellular and molecular pathology and write a paper on their topic/experience under the direction of a faculty advisor.

**MSCMP 2790** Fall, Spring, Summer 1-9 credits
**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** Fall, Spring, Summer 1-14 credits
**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.

**MSCMP 3710** Fall 3 credits
**Cancer Biology & Therapeutics**
This course presents biochemical and clinical aspects of cancer biology and therapy, designed for graduate students training in the basic sciences or medicine. The lectures cover fundamental topics in cancer biology and pathology, the biology of major cancer types, viral oncogenesis, and an overview of cancer therapeutics including chemotherapy, DNA repair-based therapies, targeted therapies, hormonal therapies, and immunotherapy. This course also covers experimental models and databases used in cancer research and the process of cancer drug development.

**MSCMP 3730** Fall, Spring 1 credit
**Topics in Experimental Neuropathology**
This course critically evaluates the latest scientific literature concerning diseases of the central nervous system. Emphasis will be placed on methodologies as they are applied to the study of human neurologic diseases. Participants will present their own research data or scientific papers and lead the classroom discussions. This course is open to students of all levels and will include both basic scientists and clinicians (residents, faculty).

**MSCMP 3735** Fall 3 credits
**Extracellular Matrix in Tissue Biology & Bioengineering**

Extracellular matrix (ECM) is a fundamental structural and signaling component of all tissues and plays a defining role in cellular and tissue responses to homeostatic cues, regeneration, inflammation, wound healing, and disease. Indeed, virtually every aspect of tissue biology and function is influenced by ECM composition, organization, and dynamics. The objective of this course is to provide students with a comprehensive understanding of the fundamental biology of ECM, its role in tissue function, and its emerging applications in bioengineering and regenerative medicine. The course will begin with an overview of the structure, biosynthesis, and gene regulation of the major protein and glycosaminoglycan components of the ECM. This will be followed by lectures on ECM-cell interactions, with emphasis on integrin-mediated adhesion, intracellular signaling cascades, and allosteric protein interactions that transmit extracellular signals to intracellular targets regulating cell proliferation, differentiation, function, and cell-cell communication. Because TGF-ß is a central regulator of ECM synthesis and remodeling, a dedicated lecture will focus on ECM gene regulation and TGF-ß-dependent signaling pathways. Subsequent lectures will cover histologic and imaging techniques for visualization of ECM and will examine specific tissue models in which ECM remodeling defines biological outcomes. Liver regeneration will be used as a detailed example, highlighting early ECM remodeling, re-synthesis during regeneration, and the role of ECM signaling in regulation of liver size and termination of the regenerative response. Additional focused lectures will address ECM function in wound healing, central nervous system repair, and bone and cartilage biology. The role of ECM as a barrier and regulator of cancer invasion will be examined, along with the cellular and molecular mechanisms by which cells invade and remodel ECM during tumor progression, organogenesis, and embryonic tissue morphogenesis. The course will conclude with cellular and bioengineering approaches that leverage ECM for tissue reconstruction and modeling, including decellularized organs, hyaluronic acid-based biomaterials and signaling, ECM in vascular, joint, and muscle reconstruction, and the use of ECM in microphysiological systems (organ-on-chip platforms), three-dimensional culture systems, and 3D bioprinting technologies.

**MSCMP 3740** Spring 3 credits

**Stem Cells**

The course will provide a comprehensive overview on this intriguing and timely topic. The course will focus on the biology of stem cells and their role in health and disease with emphasis on development, carcinogenesis, aging and tissue engineering. Lectures on various aspects of stem cells from renowned experts will cover embryonic, adult, and induced pluripotent stem cells. Specific lectures will include stem cells in the blood, placenta, bone, liver, brain, adipose, pancreas, gonads, lung, gut, skin, breast, dental/oral tissues and eye. Students will also be educated on therapeutic cloning, bio-ethical issues, synthetic and systems biology, and existing laws governing stem cell research.

**MSCMP 3750** Spring 3 credits

**Angiogenesis: Molecular Pathways & Pathophysiological Functions**

Angiogenesis is one of the important research areas in biomedical sciences. Formation of new and remodeling of existing blood vessels are fundamental processes involved in tissue homeostasis. Aberrant angiogenesis and vascular remodeling contribute to the development and progression of major cardiovascular and non-cardiovascular diseases. This course will provide extensive knowledge of developmental and pathological angiogenesis, as well as most recent advances in its clinical applications. Topics include: 1. Angiogenesis and vascular remodeling in physiological and pathological processes; 2. Molecular and cellular regulation of angiogenesis and vascular remodeling; 3. Methodologies and techniques for angiogenesis studies; 4) Current advances in angiogenic therapies.

**MSCMP 3760** Fall, Spring 1 credit

**Regenerative Medicine Research Seminar**
The seminar in regenerative medicine provides exposure to cutting-edge research in the broad fields of regenerative medicine, tissue engineering, and synthetic biology. The course blends lectures by experienced faculty, work-in-progress talks by graduate students, and professional development seminars (e.g., alternative careers in science, grant writing, and scientific communication). Lectures are held approximately twice per month, and student engagement is strongly encouraged. Grades are based on attendance and participation.

**MSCMP 3770** Spring 3 credits
**Cell Therapy**
This course showcases cell therapy from theory to practice, from the bench to the bedside and is meant to be unlike any other graduate course. In each area of cell transplantation lectures are provided by those who have implemented cell transplantation techniques and have moved it to a clinical therapy. Most of the lectures in the course are given by those who actually do the patient transplants. Immunology and pharmacology and cellular engineering & editing will be addressed as it directly relates to cellular therapy. Stem cell biology will not be addressed individually but will be raised in the context of specific applications.

**MSCMP 3790** Fall 3 credits
**Basics of Personalized Medicine**
Personalized (or Precision) medicine is rapidly becoming a clinical reality, driven by ongoing discoveries in cell biology, genomics, proteomics, and metabolomics coupled with greater understanding of disease processes. The translation of these discoveries – particularly in diagnostic, prognostic, and theragnostic applications – has accelerated dramatically. As personalized medicine continues to evolve, its successful implementation will increasingly require close collaboration between physicians and basic scientists. However, a major obstacle to this integration is the limited training of basic scientists in the principles of clinical test development and validation. This course is designed to close that gap by providing students with a foundational understanding of clinical development, testing, and validation, and by fostering an appreciation for how these processes differ from traditional investigational research. Through focused topic areas, the course explores key concepts and practical considerations in personalized medicine. The first part of the course introduces the core principles and overarching concepts of clinical test development, emphasizing the qualitative differences between clinical assays and research-based studies. Topics include entrepreneurial considerations, advanced molecular techniques, diagnostics, and ethical considerations. The remainder of the course is dedicated to distinct testing modalities targeting either nucleic acids or proteins and other external effectors. Topics include inherited genetic diseases and predispositions; acquired genetic alterations in cancer; metabolomic profiling of endocrine disorders; immune network analysis in transplantation and rejection; proteomic profiling in blood disorders; and advanced 3D bioprinting and non-animal model systems.

## 7. Assessment of Graduate Students

### 7.1: Annual Academic Assessment

Each year, all continuing CMP students are required to participate in the University of Pittsburgh School of Medicine Annual Student Assessment process. This assessment provides an opportunity to evaluate academic progress, mentoring, and professional development while identifying areas in which additional support may be beneficial.

The Annual Student Assessment includes the following components:

- Assessment of the student by the CMP Graduate Program
- Student self-assessment
- Assessment by the Major Advisor
- Confidential student assessment of thesis advising

In addition to the required University assessment materials, all continuing CMP students must submit an updated University of Pittsburgh-formatted CV and an NIH biosketch as part of the annual review. These documents help students maintain current professional materials for fellowship, grant, and career development opportunities.

Annual assessments are completed by the end of each academic year. First-year students are exempt from this requirement because successful completion of the Preliminary Examination serves as their annual academic assessment.

Following completion of the Annual Student Assessment, the CMP Graduate Program reviews each student's academic progress and determines their academic standing. One of the following outcomes will apply:

- **Good Standing:** The student advances to the next academic year in good standing.
- **Conditional Advancement:** The student advances to the next academic year but must satisfy specific requirements established by the Program.
- **Academic Probation:** The student is placed on probation for a specified period. Failure to satisfy the conditions of probation may result in dismissal from the Program for unsatisfactory academic performance.

## 7.2: Student Worker Evaluation for Graduate Student Researchers

In addition to the annual academic assessment conducted by the CMP Graduate Program, Graduate Student Researchers (GSRs) also undergo annual employment evaluations as required by University policy and the collective bargaining agreement between the University of Pittsburgh and the Graduate Student Union. Students should refer to current University guidance for information regarding the evaluation process and timelines.

## 7.3: Program Probation & Dismissal

Program Probation is used to address deficiencies in academic or research performance before a student's dismissal from the graduate program is considered. Except in cases involving serious violations of legal or ethical standards, students will not be dismissed without first being placed on Program Probation.

Written notification of Program Probation will describe the reasons for probation, the expectations for returning to good academic standing, and the timeline for reevaluation. Students' progress will be reevaluated at the conclusion of the probationary period. Program Probation is distinct from University Academic Probation and does not, by itself, affect eligibility for University financial support.

Grounds for Program Probation or termination include failure to maintain satisfactory academic performance (including a cumulative grade point average below 3.0), failure to complete

required coursework or Program milestones, inadequate research progress, failure to pass required core courses (or repeated failure of a required core course), failure to pass the Comprehensive Examination or Dissertation Defense, or violations of University policies related to academic integrity, research conduct, or other serious legal or ethical standards.

Students who fail the Comprehensive Examination or Dissertation Defense while not on Program Probation will be placed on Program Probation and ordinarily be given one additional opportunity to pass the examination. Failure of the examination on the second attempt will result in dismissal from the Program. Students who are already on Program Probation when they fail one of these examinations may or may not be granted a second opportunity to take the examination, at the discretion of the Program Director.

Students whose dissertation research progress is determined to be unsatisfactory will ordinarily be given a defined period to improve their research performance before being reevaluated. A second determination of inadequate research progress, either at that time or during a subsequent evaluation, may result in termination from the Program.

In all cases, a student's dismissal from the CMP Graduate Program requires a decision by the Program Director. Such decisions cannot be made unilaterally by an individual faculty member, Major Advisor, Dissertation Committee, or examination committee.

## 7.4: University Probation

Students are expected to maintain good academic standing as defined by the University of Pittsburgh School of Medicine. Good academic standing requires both a cumulative GPA of 3.00 or higher and satisfactory progress toward the degree. Students may be placed on University Academic Probation if their cumulative GPA falls below 3.00, if they fail to make satisfactory progress toward the degree, or if they do not meet other academic requirements established by the University. Students placed on University Academic Probation are notified in writing by the Program Director.

While on University Academic Probation, students are not eligible for University fellowships and may not complete degree milestones, including the Comprehensive Examination, dissertation proposal, dissertation defense, or graduation, until they return to good academic standing. Students should consult current University policies for complete information regarding the requirements for returning to good academic standing and the consequences of failing to do so.

## 7.5: Terminal Master's Degree

Students who leave the CMP Graduate Program after completing the Comprehensive Examination may petition the Program Director to be considered for the award of a terminal Master of Science (MS) degree. Students wishing to receive this degree must complete the appropriate University forms and satisfy all applicable University requirements.

To be eligible for a terminal Master of Science degree, students must have completed all CMP coursework requirements, successfully passed the Comprehensive Examination, and prepared and defended a master's thesis before a committee of at least three graduate faculty members. The thesis must be prepared and submitted in accordance with current University requirements for Electronic Theses and Dissertations (ETD).

# 8. Special Circumstances

This section describes CMP policies and expectations regarding leaves of absence, short breaks, attendance at scientific meetings, and disability accommodations. Because these topics are also governed by University policies, School of Medicine policies, and applicable collective bargaining agreements, students should consult current University guidance in addition to this Handbook.

## 8.1: Leaves of Absence

Leave of absence policies and parental accommodation guidelines are described in Section 11.

## 8.2: Short Break Policy

The guidance below reflects current CMP Program expectations. As University policies and the Graduate Student Union collective bargaining agreement continue to be implemented, these guidelines may be revised to remain consistent with applicable University policies.

To protect their mental and physical health, students should not be expected to conduct research seven days per week or on University holidays when the University is closed. Students may take short breaks during their time in the Program. In accordance with current University guidelines, CMP strongly recommends that short breaks be approved in advance by the student's Major Advisor and not exceed 10 working days per year, in addition to University holidays.

Due to ongoing challenges associated with international travel and visa processing, international students are strongly encouraged to discuss travel plans with their Major Advisor before making arrangements. Students who anticipate being away from the Program for more than two consecutive weeks must obtain prior approval from the Program Director.

## 8.3: Attendance at Scientific Meetings

Attendance at scientific meetings is strongly encouraged as an important component of graduate training and professional development. Students should discuss conference attendance with their Major Advisor in advance, including plans for funding and any anticipated conflicts with coursework or other Program responsibilities.

Although there are no formal limits on conference attendance, students should ensure that travel does not interfere with their academic progress or required Program activities. If conference travel conflicts with a scheduled class or other required activity, students are expected to notify the course instructor in advance and make appropriate arrangements.

## 8.4: Disability Accommodation

Students who have a disability and are requesting, or may request, an accommodation are encouraged to contact the Program Director, their course instructor, and the University of Pittsburgh Disability Resources and Services (DRS). DRS will verify the disability and determine

reasonable accommodations in accordance with University policies. DRS can be reached at 412-648-7890 or 412-383-7355 (TTY).

## 9. Milestones

### 9.1: Preliminary Examination

All IBGP students must successfully complete the IBGP Preliminary Examination at the end of their first year of graduate study. The Preliminary Examination is administered by the IBGP and evaluates first-year academic performance, laboratory rotation performance, and selection of a dissertation laboratory.

Successful completion of the Preliminary Examination requires that the student has identified a laboratory for their dissertation research. Failure to identify a dissertation laboratory may result in dismissal from the CMP Graduate Program and, consequently, the University of Pittsburgh.

Upon successful completion of the Preliminary Examination, students advance to the second year of graduate study, join the CMP Graduate Program, and begin dissertation research under the supervision of their Major Advisor.

### 9.2: Comprehensive Examination

The Comprehensive Examination is a major milestone in the CMP Graduate Program and must be successfully completed before a student may be admitted to candidacy for the PhD degree. The examination is designed to assess the student's ability to:

- Independently evaluate and critically analyze the scientific literature
- Integrate scientific findings into broader conceptual frameworks
- Develop testable hypotheses
- Design experimental approaches to evaluate hypotheses
- Demonstrate the ability to communicate and defend scientific ideas in both written and oral formats

The Comprehensive Examination proposal should be based on the student's intended dissertation research while representing an original and scholarly body of work. The Major Advisor may assist in developing the concepts presented in the Specific Aims but may not prepare, review, or edit any other portion of the written proposal. Likewise, members of the Comprehensive Examination Committee may not review or critique either the written proposal or the oral presentation before the examination. Students are encouraged to seek feedback from fellow students and other colleagues who are not members of the Comprehensive Examination Committee. Additional requirements for the written proposal and oral examination are described in Sections 9.2b and 9.2c.

Students are *expected* to complete the Comprehensive Examination within 12 months of joining their dissertation laboratory, although they may be granted up to 16 months with the Program Director's approval. This timeline provides students with an opportunity to master the literature relevant to their research interests and ultimately to demonstrate the competency expected for doctoral candidacy. Requests to extend the examination beyond 12 months should be submitted in writing to the Program Director and should include the reason for the request and the proposed examination date.

**Implementation Note:** Beginning with students entering the CMP Graduate Program on or after September 1, 2027, the Comprehensive Examination must be completed within 12 months of joining their dissertation laboratory.

### *9.2a: Committee*

The Comprehensive Examination Committee is nominated by the student and Major Advisor and approved by the Program Director. The committee should be established within 9 months of joining the dissertation laboratory (typically by May 31). Students must submit a draft of their Specific Aims to the Program Director when proposing their committee, by the same deadline. A preliminary draft is sufficient; its purpose is to outline the proposed research and inform committee selection and approval. The committee consists of five or six members and must satisfy the following requirements:

- A majority of members must be CMP Graduate Training Faculty.
- A majority of members must have Graduate Faculty status at the University of Pittsburgh.
- The Major Advisor is not required to serve on the committee but may participate as a non-voting member. The Major Advisor may not serve as Chair.

The Chair is selected by the student and Major Advisor, in consultation with the Program Director, before the first committee meeting. Although not required, it is recommended that the Chair be a member of the CMP Graduate Training Faculty.

### *9.2b: Written Examination*

The written portion of the Comprehensive Examination consists of an original research proposal based on the student's dissertation research area. The proposal must follow the general format of an NIH F30 or F31 fellowship application.

The proposal must be conceptually well founded, adequately documented, and represent the student's own scholarly work. Although the proposed research may build upon the Major Advisor's research program, the written proposal must be original and should not consist of a verbatim or only slightly modified version of any published or unpublished manuscript, grant application, or other document.

The Major Advisor may assist in developing the concepts presented in the Specific Aims but may not prepare, review, or edit any other portion of the written proposal. Members of the Comprehensive Examination Committee may not review or critique any part of the written proposal before it is submitted. Students are encouraged to seek feedback from fellow students and other colleagues who are not members of the Comprehensive Examination Committee.

The proposal should be well organized, clearly written, and grammatically correct. It should present well-defined hypotheses, a strong scientific rationale, and innovative experimental approaches that address the stated Specific Aims. Rather than presenting a collection of experiments, the proposal should describe a cohesive research plan that addresses important scientific questions.

1. **Structure and page limits:** The written research proposal must include the following sections:
    a. **Title Page**
    b. **Specific Aims:** Maximum 1 page.
    c. **Significance/Background and Innovation**

d. **Approach:** Includes preliminary data, research design, and methods. The combined Significance/Background and Innovation and Approach sections may not exceed 6 pages.
e. **Literature Cited:** Include complete citations with all authors, year, title, journal, volume, and inclusive page numbers. References should be limited to relevant published and unpublished sources that are pertinent to the proposed research. No page limit.

2. **Formatting:** The proposal should be single-spaced with 0.5-inch margins on all sides and prepared using Arial 11-point font. Line spacing should not exceed six lines of text per vertical inch.

3. **Submission:** The proposal must be submitted as a single PDF file named Lastname_Year.pdf. The proposal must be distributed electronically to the Graduate Coordinator and all members of the Comprehensive Examination Committee at least one week before the oral examination.

### *9.2c: Oral Examination*

The oral examination is held no sooner than one week after submission of the written proposal. The student must complete the oral examination in person. Committee members are expected to attend in person; however, exceptions may be made under extraordinary circumstances, such as an emergency on the day of the examination (e.g., illness or an accident) that prevents a committee member from attending in person or when a committee member from outside the University of Pittsburgh is unable to attend in person. The CMP Graduate Program believes that in-person meetings provide the most productive environment for the Comprehensive Examination.

The examination begins with a presentation of the research proposal (approximately 40 minutes), followed by an oral examination administered by the Comprehensive Examination Committee. Students are expected to defend their hypotheses, justify their experimental design, and demonstrate a thorough understanding of the relevant scientific literature, the significance of the proposed research, and the rationale underlying the proposed experiments. Students should be prepared to answer questions related to any aspect of their written proposal or oral presentation, including the underlying scientific concepts, experimental approaches, methodologies, interpretation of data, and relevant background information. Questions should be reasonably related to the content and scientific context of the proposal and presentation.

The oral examination, including both the presentation and the question-and-answer period, typically lasts two to three hours.

### *9.2d: Evaluation*

At the conclusion of the oral examination, the student will leave the room while the Comprehensive Examination Committee deliberates. The student will then be informed of the committee's decision. The committee may assign one of three outcomes:

- **Pass:** The student has successfully completed the Comprehensive Examination and may proceed with establishing the Dissertation Committee, completing the Dissertation Overview, and applying for admission to candidacy for the PhD.
- **Partial Pass:** The student has demonstrated satisfactory performance overall but must address one or more identified deficiencies before successfully completing the examination.
- **Fail:** The student's performance does not meet the standards required to pass the Comprehensive Examination.

Students who receive a **Partial Pass** will be provided with a written description of the deficiencies identified by the committee and the specific requirements for successfully completing the examination. These requirements may include revision of portions of the written proposal, additional written work, a repeat of part or all of the oral examination, or other actions deemed appropriate by the committee. All requirements associated with a Partial Pass must be completed within **two months** of the initial oral examination unless otherwise approved by the Program Director. Failure to satisfy these requirements within this timeframe will result in a failing grade for the Comprehensive Examination.

Students who receive a **Fail** will ordinarily be permitted one opportunity to repeat the Comprehensive Examination, provided they are not already on Program Probation. Students who are already on Program Probation at the time of a failing examination may or may not be granted a second opportunity to take the examination, at the discretion of the Program Director. The second examination must be completed within **three months** of the initial examination.

Successful completion of the Comprehensive Examination is required before a student may apply for admission to candidacy for the PhD. Following successful completion of the examination, the Program submits the appropriate documentation to the School of Medicine Office of Graduate Studies.

## 9.3: Dissertation

The dissertation is the culminating scholarly achievement of the CMP Graduate Program and represents the student's original contribution to biomedical science. Through the dissertation, students demonstrate their ability to conceive, conduct, interpret, and communicate independent research that advances knowledge in their field.

The following sections describe the requirements for the dissertation committee, admission to candidacy, committee meetings, dissertation preparation, defense, and graduation.

### *9.3a: Doctoral Dissertation Advisory & Final Examination Committee*

Following successful completion of the Comprehensive Examination, the student and Major Advisor nominate the Dissertation Committee, which must be approved by the Program Director before the student may convene the Dissertation Overview meeting. The Dissertation Committee may retain members of the Comprehensive Examination Committee, but its membership requirements differ: it must include a member from outside the Major Advisor's primary graduate program, and the Major Advisor must serve as a voting member.

The committee consists of a minimum of five members and typically includes five or six members. Although University guidelines require a minimum of four committee members, CMP requires at least five. The committee must satisfy the following requirements:

- A majority of members must be CMP Graduate Training Faculty.
- A majority of members must have Graduate Faculty status at the University of Pittsburgh.
- At least one member must be from outside the Major Advisor's primary graduate program. This individual may be from another University of Pittsburgh graduate program or from another institution.
- The Major Advisor must serve as a voting member of the committee but may not serve as Chair.

- The Chair is selected by the student and Major Advisor, in consultation with the Program Director, before the first committee meeting. Although not required, it is recommended that the Chair be a member of the CMP Graduate Training Faculty.

### *9.3b: Dissertation Overview (Prospectus Meeting) and Admission to Candidacy*

The first Dissertation Committee meeting, known at the University as the Dissertation Overview or Prospectus Meeting, is a University requirement. The meeting should be held within six months of successfully completing the Comprehensive Examination. The meeting should follow the same format and attendance guidelines as subsequent Dissertation Committee meetings (see Section 9.3c). Because the Comprehensive Examination proposal is typically based on the student's intended dissertation research in the CMP Graduate Program, the written proposal submitted for the Comprehensive Examination, together with any revisions requested by the committee, generally serves as the dissertation proposal.

During the Dissertation Overview meeting, the Dissertation Committee reviews the dissertation proposal, provides feedback, and approves the student's dissertation plan. Following successful completion of the Dissertation Overview, students submit the required University forms for the Dissertation Overview and Admission to Candidacy. Admission to Candidacy is a University administrative milestone that formally recognizes a student as a PhD candidate. Completion of this requirement is necessary before enrolling in PhD Dissertation Research (MSCMP 3700).

### *9.3c: Dissertation Committee Meeting*

Following the Dissertation Overview (Prospectus Meeting), students must meet with their Dissertation Committee at least every six months. During these meetings, students present their research progress, discuss future directions, and receive guidance from their Dissertation Committee. If a student's progress is determined to be unsatisfactory, they may be placed on Program Probation for a specified period, together with clear expectations for returning to good academic standing.

Following each meeting, the Committee Chair is responsible for preparing a written summary of the committee's recommendations and submitting it to the Graduate Coordinator. The summary will be distributed to the student and maintained in the student's Program file.

To promote open communication, it is recommended that the committee meet separately with the Major Advisor (without the student) and with the student (without the Major Advisor) during each committee meeting. Although the timing is left to the discretion of the committee, the meeting with the Major Advisor typically occurs before the student presentation, and the meeting with the student typically occurs afterward. Any significant concerns raised during these discussions should be communicated to the Program Director.

Dissertation Committee meetings should be held in person whenever possible. When this is not feasible, particularly for committee members located at satellite campuses around Pittsburgh, meetings may be conducted virtually. Although hybrid meetings are permitted, meetings that are conducted entirely in person or entirely virtually are generally preferred, as they provide a more consistent and effective experience for all participants.

Although attendance by all Dissertation Committee members is preferred, the six-month meetings may proceed with four members present, provided that both the Major Advisor and the Committee Chair attend. If any committee members are absent, the student must schedule one or more separate meetings to update them on their research progress and future directions.

### *9.3d: Written Dissertation*

Preparation of the written dissertation must comply with the University of Pittsburgh Electronic Theses and Dissertations (ETD) requirements. Current formatting instructions and submission guidelines are available on the ETD website.

The dissertation should provide a comprehensive account of the student's original research and should generally include:

- An introduction that provides a thorough review of the relevant literature and establishes the significance of the research.
- A methods section that includes sufficient detail to allow the work to be understood and reproduced, including appropriate references to previously published methods.
- A results section that presents the research findings and, when appropriate, includes additional confirmatory or supporting data that may not be included in published manuscripts.
- A general discussion that integrates the findings, highlights their broader significance, and places the work in the context of the field.

Published, submitted, or unpublished manuscripts authored or co-authored by the student may be incorporated into the dissertation, provided they are based on the student's dissertation research. To integrate these manuscripts into a cohesive dissertation, students should prepare introductory and discussion sections that place the individual manuscripts within the broader context of the research and synthesize the overall conclusions. When manuscripts are co-authored, the student's specific contributions must be clearly described in accordance with ETD guidelines.

Students should provide the completed dissertation to all committee members at least two weeks before the dissertation defense. Submitting the dissertation to the committee indicates that the Major Advisor has reviewed the document and considers it ready for committee evaluation.

### *9.3e: Application for Graduation*

Students intending to graduate must submit an official Application for Graduation through the Office of Graduate Studies during the term in which they expect to complete their degree. It is the student's responsibility to meet all University deadlines associated with graduation. If graduation is delayed, a new Application for Graduation must be submitted for the subsequent term in which graduation is anticipated. Students should consult the Office of Graduate Studies for current graduation deadlines, procedures, and associated fees.

### *9.3f: Announcement of Dissertation Defense*

At least one month before the dissertation defense, students must provide the Graduate Coordinator with the dissertation title and the date, time, and location of the defense. The appropriate University offices will distribute the defense announcement to the University community.

### *9.3g: Final Oral Examination*

The Final Oral Examination consists of a public presentation of the dissertation research followed by a private oral examination conducted by the Dissertation Committee. Faculty, trainees, staff, family members, and other guests are welcome to attend the public presentation. The Committee Chair oversees the examination and explains the procedures. The Major Advisor typically introduces the candidate before the public presentation.

The public presentation is typically 45 minutes in length and is followed by a question-and-answer session with the audience. After the public presentation concludes, the Dissertation

Committee convenes a private oral examination with the candidate. During the private examination, students are expected to defend their dissertation, justify their experimental design and interpretation of the findings, and demonstrate a comprehensive understanding of their research and its broader scientific context.

Following the private examination, the candidate leaves the room while the Dissertation Committee deliberates. The Major Advisor may participate in the discussion but does not participate in the committee's evaluation or vote. The Major Advisor may also be asked to leave during a portion of the committee's deliberations. At the conclusion of the deliberation, the student is invited back into the room and receives a verbal summary of the committee's decision and any required revisions.

The committee may recommend one of the following outcomes:

- **Pass:** The dissertation and oral defense are satisfactory. Minor revisions to the written dissertation may be requested before final approval.
- **Revision Required:** The committee requires revisions to the written dissertation and/or additional oral examination before granting final approval. All requirements must be completed within three months unless otherwise approved by the Program Director.
- **Fail:** Students who fail the Final Oral Examination may repeat the examination once within three months. Failure to successfully complete the examination on the second attempt may result in dismissal from the Program.

If the committee's decision is not unanimous, the matter will be resolved by the Associate Dean for Graduate Studies in consultation with the Program Director. Following successful completion of the Final Oral Examination and any required revisions, the required University forms must be completed and submitted to the Office of Graduate Studies.

## 9.4: Final Graduation Steps

Following successful completion of the Final Oral Examination and all required revisions, students must complete the remaining University graduation requirements, including final submission and approval of the dissertation through the University ETD process.

After the dissertation has been approved, students should notify the CMP Graduate Coordinator of their graduation date and provide updated contact information. This allows the Program to complete its graduation procedures, update student records, and conduct the CMP exit interview.

Students are responsible for ensuring that all University graduation requirements have been completed, including registration, graduation deadlines, and any applicable fees. Students should consult the Office of Graduate Studies for current graduation procedures and deadlines.

### 9.5: Major Program Milestones Summary

| Stage of Training | Milestone | Typical Timeline |
|---|---|---|
| First Year (IBGP only) | Preliminary Examination | End of first year |
| After Joining Dissertation Laboratory | Establish Comprehensive Examination Committee | Within 9 months (typically by May 31) |
| | Complete Comprehensive Examination | Within 12 months * |
| After Passing the Comprehensive Examination | Dissertation Overview (Prospectus Meeting) and Admission to Candidacy | Within 6 months |
| Dissertation Phase | Dissertation Committee Meetings | Every 6 months |
| Annual Requirement | Annual Student Assessment | End of each academic year ** |
| Graduation | Application for Graduation | During the graduation term |
| | Submit Dissertation to Committee for Defense | At least 2 weeks before the defense |
| | Final Oral Examination (Dissertation Defense) | As scheduled by the Dissertation Committee |

* Beginning with students entering the CMP Graduate Program on or after September 1, 2027, the Comprehensive Examination must be completed within 12 months of joining their dissertation laboratory. Students entering before this date may be granted up to 16 months with Program Director approval.

** First-year IBGP students are exempt because successful completion of the Preliminary Examination serves as their annual academic assessment.

The CMP Graduate Coordinator prepares the required milestone forms using information provided by the student. Students are responsible for notifying the Graduate Coordinator in advance of committee meetings, examinations, and other Program milestones. Students should also promptly report changes to committee membership, dissertation title, or other milestone information to ensure that Program records remain accurate.

## 10. Financial Support & Appointments

### 10.1: Appointments and Support

CMP students receive financial support through one of several appointment mechanisms administered by the University of Pittsburgh School of Medicine. Most students are appointed as Graduate Student Researchers (GSRs), while others are supported through institutional training grants (e.g., NIH T32 awards) or individual predoctoral fellowships (e.g., NIH F30 or F31 awards).

- **Graduate Student Researchers (GSRs)** are generally supported through faculty research grants. Additional information is available in the Graduate Student Researchers (GSR) Academic Regulations.

- **Trainees** are generally supported through institutional training grants (e.g., NIH T32 awards). Additional information is available in the Predoctoral Fellows and Trainees Policy.
- **Predoctoral Fellows** are generally supported through individual predoctoral fellowships (e.g., NIH F30 or F31 awards). Additional information is available in the Predoctoral Fellows and Trainees Policy.

The School of Medicine maintains a common stipend for all PhD students, regardless of graduate program or educational background. Individual competitive fellowships that provide a higher stipend are exceptions to this policy. Fellowships that provide a lower stipend are supplemented to the School of Medicine stipend level.

### 10.2: Externship Opportunities

Senior students may participate in externships or other professional development activities with the approval of their Major Advisor. These activities should complement the student's graduate training and must not interfere with satisfactory academic or research progress. In accordance with University guidelines, students typically should not devote more than an average of 10 hours per week over the duration of the externship or related activity.

## 11. Policies, Resources, & Resolving Concerns

### 11.1: Policies & Resources

The following policies and resources apply to all graduate students in the University of Pittsburgh School of Medicine. Students are responsible for familiarizing themselves with these policies and resources. Current information is available on the School of Medicine Office of Graduate Studies Policies & Resources webpage.

- Leave of Absence
- Graduate Student Parental Accommodations Guidelines
- Financial Aid
- Educational Enrichment Account (for PhD programs that offer this)
- External Support for Graduate Students
- Tuition
- University of Pittsburgh Code of Conduct
- Academic Integrity Guidelines
- Research Integrity Policy
- Bias/Mistreatment
- Office of the Learning Environment (OLE)
- School of Medicine Ombuds Office
- Title IX
- Biomedical Graduate Student Association
- Graduate Student Unionization
- Drug and Alcohol Policies and Resources
- Building Emergency or Inclement Weather Policy for Students
- University Resources

## 11.2: Resolving Concerns

The CMP Graduate Program is committed to fostering a supportive, respectful, and collaborative graduate training environment. Students are encouraged to address questions or concerns promptly, as early communication often helps resolve issues before they become more difficult to address. Depending on the nature of the concern, students may find the following resources helpful:

- **Major Advisor:** Questions related to research, mentoring, laboratory expectations, and academic progress.
- **Program Director:** Concerns regarding Program requirements, mentoring relationships, committee issues, academic progress, or other matters affecting graduate training. Students who are unsure where to seek assistance are encouraged to contact the Program Director, who can help identify the most appropriate Program or University resource.
- **Health Sciences Ombuds Office:** Confidential, impartial assistance with conflict resolution and navigating difficult situations.
- **Office of the Learning Environment (OLE):** Concerns related to mistreatment, professionalism, or the learning environment.
- **Office of Institutional Engagement and Wellbeing (Civil Rights & Title IX):** Concerns involving discrimination, harassment, retaliation, sexual misconduct, or other matters related to civil rights and Title IX.

## 12. CMP Graduate Training Faculty

The following list of CMP Graduate Training Faculty is current as of September 1, 2026. For the most up-to-date faculty roster, please visit the CMP website.

### Full-Time Faculty

| Name | Email | Affiliation |
|---|---|---|
| Dr. Kalil Abdullah | abdullahkg@upmc.edu | Neurosurgery |
| Dr. Sameer Agnihotri | sameer.agnihotri@pitt.edu | Neurosurgery |
| Dr. Jonathan Alder | jalder@pitt.edu | Medicine/CCM |
| Dr. Christiano Alves | cra92@pitt.edu | Pathology |
| Dr. Cristian Apetrei | apetreic@pitt.edu | Immunology |
| Dr. Gavin Arteel | gearteel@pitt.edu | Medicine |
| Dr. Marija Balic | balicm@upmc.edu | Medicine |
| Dr. Jason Becker | beckerj@pitt.edu | Medicine |
| Dr. Juliane Beier | jibeier@pitt.edu | Medicine |
| Dr. Kambez Benam | kambez.benam@pitt.edu | Medicine/CCM |
| Dr. Afshin Beheshti | beheshti@pitt.edu | Surgery/Trivedi/MIRM |
| Dr. Bharat Bhushan | bhb14@pitt.edu | Pathology |
| Dr. Timothy Billiar | billiartr@upmc.edu | Surgery |
| Dr. Harry Blair | hcblair@pitt.edu | Pathology |
| Dr. Irina Bochkis | bochkisi@pitt.edu | Pathology |
| Dr. Cary Boyd-Shiwarski | crb44@pitt.edu | Medicine (Renal) |
| Dr. Tullia Bruno | tbruno@pitt.edu | Immunology |
| Dr. Ronald Buckanovich | buckanovichrj@mwri.magee.edu | Medicine |
| Dr. Sandra Cascio | sac131@pitt.edu | Ob/Gyn (Magee) |
| Dr. Stephen Y. Chan | chansy@pitt.edu | Medicine (VMI) |
| Dr. Divay Chandra | dic15@pitt.edu | Medicine |
| Dr. Yuan Chang | yc70@pitt.edu | Pathology/HCC |
| Dr. Yuanyuan Chen | yuanyuan.chen@pitt.edu | Ophthalmology |
| Dr. Yu-Chih Chen | cheny25@upmc.edu | Comp Biol |
| Dr. Charleen Chu | ctc4@pitt.edu | Pathology |
| Dr. Lan Coffman | coffmanl@upmc.edu | Medicine/MWRI |
| Dr. Christopher Cunningham | cunningc@pitt.edu | Otolaryngology |
| Dr. Jishnu Das | jishnu@pitt.edu | Immunology |
| Dr. Brian Davis | bmd1@pitt.edu | Neurobiology |
| Dr. Silmara de Lima | silmara.delima@pitt.edu | Ophthalmology |
| Dr. Marie DeFrances | defrancesmc@upmc.edu | Pathology |
| Dr. Charles Dela Cruz | delacruz@pitt.edu | Medicine |
| Dr. H. Henry Dong | dongh@pitt.edu | Pediatrics (Child) |
| Dr. Andrew Duncan | duncana@pitt.edu | Pathology |
| Dr. Mo Ebrahimkhani | mo.ebr@pitt.edu | Pathology |
| Dr. Toren Finkel | finkelt@pitt.edu | Medicine (AI) |
| Dr. Magali Fontaine | fontainemj@upmc.edu | Pathology |
| Dr. Zachary Freyberg | freyberg@pitt.edu | Psychiatry |
| Dr. Daniel Gao | danielgao@pitt.edu | Ophthalmology |
| Dr. Subhadip Ghatak | ghataks@pitt.edu | Surgery |
| Dr. George Gittes | george.gittes@chp.edu | Surgery (Child) |
| Dr. Delphine Gomez | gomezd@pitt.edu | Medicine (VMI) |
| Dr. Sarah Hainer | sarah.hainer@pitt.edu | Biological Sciences |
| Dr. Jing Hong Wang | jhw51@pitt.edu | Hem/Onc/HCC |
| Dr. Baoli Hu | baolihu@pitt.edu | Neurosurgery |
| Dr. George Hussey | gsh8@pitt.edu | Pathology/MIRM |
| Dr. Hun-Way Hwang | hunway.hwang@pitt.edu | Pathology |
| Dr. Smita Iyer | siyer.3@pitt.edu | Pathology |
| Dr. Eldin Jasarevic | eldin.jasarevic@pitt.edu | Obstetrics, Gyn and Rep Sci |
| Dr. Daniel Kass | kassd2@upmc.edu | Medicine |
| Dr. Brett Kaufman | bkauf@pitt.edu | Medicine |
| Dr. Neil Kelly | njk88@pitt.edu | Medicine |
| Dr. Erin Kershaw | kershawe@pitt.edu | Medicine |
| Dr. Corinne Kliment | ckliment@pitt.edu | Medicine/CCM |

| | | |
|---|---|---|
| Dr. Melanie Koenigshoff | koenigshoffm@upmc.edu | Medicine/CCM |
| Dr. Julia Kofler | koflerjk@upmc.edu | Pathology |
| Dr. Alison Kohan | akohan@pitt.edu | Medicine |
| Dr. Gary Kohanbash | gary.kohanbush2@chp.edu | Neur. Sur (Child) |
| Dr. Tatiana Kudryashova | tvk4@pitt.edu | Medicine |
| Dr. Robert Lafyatis | lafyatis@pitt.edu | Medicine |
| Dr. Eric Lagasse | eric_lagasse@yahoo.com | Pathology |
| Dr. Adrian Lee | leeav@upmc.edu | Pharm and CB |
| Dr. Gang Li | lig@pitt.edu | Medicine (AI) |
| Dr. Jing Li | jil601@pitt.edu | Immunology |
| Dr. Hang Lin | hal46@pitt.edu | Ortho Surg (BSP) |
| Dr. Silvia Liu | shl96@pitt.edu | Pharm and CB |
| Dr. Ekaterina Lobanova | lobanova@pitt.edu | Ophthalmology |
| Dr. Marcus Malek | marcus.malek@chp.edu | Surgery |
| Dr. Wendy M. Mars | wmars@pitt.edu | Pathology |
| Dr. Curtis McCloskey | cmr286@pitt.edu | Computational and Systems Biology |
| Dr. Melissa McGovern | mcgoverm@pitt.edu | Otolaryngology |
| Dr. Christina Megli | meglicj@upmc.edu | Obstetrics, Gyn and Rep Sci |
| Dr. George K. Michalopoulos | michalopoulosgk@upmc.edu | Pathology |
| Dr. Mark Miedel | mmiedel@pitt.edu | Pathology |
| Dr. Pamela Moalli | pmoalli@mail.magee.edu | Ob/Gyn (Magee) |
| Dr. Satdarshan (Paul) Monga | smonga@pitt.edu | Pharm and CB |
| Dr. Michael Morowitz | michael.morowitz@chp.edu | Pediatrics |
| Dr. Mousumi Moulik | mousumi.moulik@chp.edu | Pediatrics |
| Dr. Yvonne Mowery | yvm3@pitt.edu | Radiation Oncology |
| Dr. Benjamin Nacev | nacevba@upmc.edu | Medicine (HCC) |
| Dr. Niranjana Natarajan | nataraj1@pitt.edu | Medicine |
| Dr. Matthew Neal | nealm2@upmc.edu | Surgery |
| Dr. Jessie Nedrow | nedrowj@upmc.edu | Radiology(HCC) |
| Dr. Kari Nejak-Bowen | knnst5@pitt.edu | Pharm and CB |
| Dr. Toru Nyunoya | nyunoyat@upmc.edu | Medicine |
| Dr. Michael Oertel | mio19@pitt.edu | Pharm and CB |
| Dr. Steffi Oesterreich | oesterreichs@upmc.edu | Pharm and CB |
| Dr. Hatice Osmanbeyoglu | osmanbeyogluhu@pitt.edu | Biomedical Informatics |
| Dr. Tim Oury | tdoury@pitt.edu | Pathology |
| Dr. Ivona (Vasile) Pandrea | pandrea@pitt.edu | Pathology |
| Dr. Andrey Parkhitko | aparkhitko@pitt.edu | Medicine (AI) |
| Dr. Thomas Pearce | pearcetm@upmc.edu | Pathology |
| Dr. Julie Phillippi | phillippija@upmc.edu | Surgery/MIRM |
| Dr. Reben Raeman | reben.raeman@pitt.edu | Pharm and CB |
| Dr. Hooman Rashidi | rashidihh@upmc.edu | Pathology |
| Dr. Babak Razani | brazani@pitt.edu | Card. (VMI) |
| Dr. Sarah Ross | saross@pitt.edu | Neurobiology |
| Dr. Amrita Sahu | ams519@pitt.edu | Physical Medicine and Rehab |
| Dr. Nicole Scheff | nns18@pitt.edu | Neuro (HCC) |
| Dr. Iain Scott | scotti2@upmc.edu | Medicine (VMI) |
| Dr. Melanie Scott | scotmx@upmc.edu | Surgery |
| Dr. Daniel Shiwarski | djs87@pitt.edu | Bioengineering |
| Dr. Ian Sigal | ias6@pitt.edu | Ophthalmology |
| Dr. Kanhaiya Singh | singhk@pitt.edu | Surgery |
| Dr. Thing Rinda Soong | soongt@upmc.edu | Pathology |
| Dr. Alejandro Soto-Gutierrez | als208@pitt.edu | Pathology |
| Dr. Cynthia St. Hilaire | sthilaire@pitt.edu | Medicine (VMI) |
| Dr. Roderick Tan | tanrj@upmc.edu | Medicine (Renal) |
| Dr. Sina Tavakoli | sit23@pitt.edu | Radiology |
| Dr. Heth Turnquist | het5@pitt.edu | Surgery |
| Dr. Dario Vignali | dvignali@pitt.edu | Immunology |
| Dr. Flordeliza Villanueva | villanuevafs@upmc.edu | Medicine (VMI) |
| Dr. Nam Vo | nvv1@pitt.edu | Ortho Surg |
| Dr. Qingde Wang | wangq2@upmc.edu | Surgery |
| Dr. Alan Wells | wellsa@upmc.edu | Pathology |
| Dr. Zachary Wills | zpwills@pitt.edu | Neurobiology |
| Dr. Haodi Wu | haodi@pitt.edu | Medicine (VMI) |
| Dr. Yi Xuan | xuan.nano@pitt.edu | Surgery |

| | | |
|---|---|---|
| Dr. Vijay Yechoor | yechoorv@pitt.edu | Medicine |
| Dr. Lianghui (Lucy) Zhang | lhzhang@pitt.edu | Medicine (VMI) |

## Auxiliary Faculty

| Name | Email | Affiliation |
|---|---|---|
| Dr. Michael Becich | becich@pitt.edu | Bioinformatics |
| Dr. Aaron Bell | bellaaro@pitt.edu | Pharm and CB |
| Dr. Sarah Berman | bermans@upmc.edu | Neurology |
| Dr. Bryan Brown | brownb@upmc.edu | Bioengineering |
| Dr. Evan Delgado | delgadev@musc.edu | Pathology |
| Dr. Anthony Demetris | demetrisaj@upmc.edu | Pathology |
| Dr. Chris Donnelly | chrisdonnelly@pitt.edu | Neurobiology |
| Dr. David Gau | dave.gau@pitt.edu | Pathology |
| Dr. Samira Kiani | samira.kiani@pitt.edu | Pathology |
| Dr. John Kirkwood | kirkwoodjm@upmc.edu | Medicine (HCC) |
| Dr. Sungjin Ko | sungjin@pitt.edu | Pathology |
| Dr. Scott Kulich | kulichsm@upmc.edu | Pathology |
| Dr. Peter Lucas | lucas.peter@mayo.edu | Pathology (Adj) |
| Dr. Jianhua Luo | luoj@upmc.edu | Pathology |
| Dr. Kacey Marra | marrkx@upmc.edu | Surgery |
| Dr. Yuri Nikiforov | nikiforovye@upmc.edu | Pathology |
| Dr. Kenichi Tamama | tamamakj@upmc.edu | Pathology |
| Dr. Angus Thomson | thomsonaw@upmc.edu | Surgery |
| Dr. Thanos Tzounopoulos | thanos@pitt.edu | Otolaryngology |
| Dr. Yoram Vodovotz | vodovotzy@upmc.edu | Surgery |
| Dr. David Vorp | vorpda@upmc.edu | BioE/MIRM |
| Dr. Xiaosong Wang | wangx13@pitt.edu | Path/HCC |
| Dr. Zhou Wang | wangz2@upmc.edu | Urology/HCC |
| Dr. Sally (Morganroth) Wenzel | swenzel@pitt.edu | SPH/EOH |
| Dr. Reza Zarnegar | rezazar@pitt.edu | Pathology |
| Dr. Bokai Zhu | bzhu@pitt.edu | Medicine |

## 13. Current CMP Students & Their Mentors

The following list of current CMP students is current as of September 1, 2026.

| Name | Email | Major Advisor |
|---|---|---|
| Haley Arbore | HCA3@pitt.edu | Juliane Beier, PhD |
| Sanjana Basak | SAB781@pitt.edu | Delphine Gomez, PhD |
| Molly Behan | Behan.Molly@medstudent.pitt.edu | Corrine Kliment, MD, PhD |
| Yu Bian | yub29@pitt.edu | Bokai Zhu, PhD |
| Winnie Cheng | yuc186@pitt.edu | Toren Finkel, MD, PhD |
| Brian James Chew | brianchew@pitt.edu | Brett Kaufman, PhD |
| Tony Chiang | chc396@pitt.edu | Kari Nejak-Bowen, MBA, PhD |
| Joseph Collura | JLC272@pitt.edu | Melissa McGovern, PhD |
| Carlos Cosme | Cosme.Carlos@medstudent.pitt.edu | Babak Razani, MD, PhD |
| Rachel Covitz | RAC388@pitt.edu | Lianghui (Lucy) Zhang, MD, PhD |
| Andrew Craig | AMC340@pitt.edu | Jonathan Alder, PhD |
| Maria Dam Ferdinez | MDR167@pitt.edu | Curtis McCloskey, PhD |
| Rutuja Deshmukh | RCD36@pitt.edu | Adrian Lee, PhD |
| Ava Dou | yid62@pitt.edu | Dario Vignali, PhD |
| Jack Drda | Drda.Jack@medstudent.pitt.edu | Alison Kohan, PhD |
| Alysa Evans | ALE148@pitt.edu | Christina Megli, MD, PhD |
| Sofie Fischler | SOF52@pitt.edu | Tullia Bruno, PhD & Nicole Scheff, PhD |
| Benjamin Glennon | bjg78@pitt.edu | Christiano Alves, PhD & Amantha Thathiah, PhD |
| Jason Hong | Hong.Jason@medstudent.pitt.edu | Benjamin Nacev, MD, PhD |
| Eileen Liu Huang | eih18@pitt.edu | Melanie Koenigshoff, MD, PhD |
| Danielle Illy | DAI45@pitt.edu | Roderick Tan, MD, PhD |
| Niloofar Jaafari | NIJ89@pitt.edu | Thomas Pearce, MD, PhD |
| Alice Jiang | sij38@pitt.edu | Stephen Chan, MD, PhD |
| Dana Julian | drj21@pitt.edu | Julia Kofler, MD |
| Minjie Kuang | MIK371@pitt.edu | Heth Turnquist, PhD |
| Rusy Lee | HYL81@pitt.edu | Silmara de Lima, PhD |
| Jack Little | jol114@pitt.edu | Peter Lucas, MD, PhD & Linda McAllister-Lucas, MD, PhD |
| Zhenghao Liu | zhl311@pitt.edu | Alex Soto-Gutierrez, MD, PhD |
| Ugonna Mbaekwe | ugm1@pitt.edu | Corrine Kliment, MD, PhD |
| Christopher Merkel | CHM323@pitt.edu | Steffi Oesterreich, PhD |
| Kaylee Montanari | KayleeMontanari@pitt.edu | David Gau, PhD |
| Noor Nader | Nader.Noor@medstudent.pitt.edu | Tullia Bruno, PhD |
| Justin Navidzadeh | JUN46@pitt.edu | Babak Razani, MD, PhD |
| Nadine Oury | Oury.Nadine@medstudent.pitt.edu | Sarah Ross, PhD |
| Sita Paudel | SIP82@pitt.edu | Cristian Apetrei, PhD |
| Stephanie Podguski | s.podguski@pitt.edu | Corrine Kliment, MD, PhD |
| Ruvi Ranatunga | RNR17@pitt.edu | Christina Megli, MD, PhD |
| Yahira Rivera-Lopez | YAR59@pitt.edu | Henry Dong, PhD |
| Kienan Salvadore | kis111@pitt.edu | Lianghui (Lucy) Zhang, MD, PhD |
| Riley Sawka | RIS227@pitt.edu | Julia Kofler, MD |
| Justine Shamber | jus259@pitt.edu | Cynthia St. Hilaire, PhD |
| Kavisha Silva | KAS1028@pitt.edu | Jason Becker, MD |
| Claudia Sun | yas95@pitt.edu | Dario Vignali, PhD |
| Swathi Suresh | SWS80@pitt.edu | Kanhaiya Singh, PhD |
| Srishti Tiwari | SRT122@pitt.edu | Benjamin Nacev, MD, PhD |
| Karensa Tjoa | Tjoa.Karensa@medstudent.pitt.edu | Sameer Agnihotri, PhD |
| Aisha Vallopra | aiv7@pitt.edu | Cary Boyd-Shiwarski |
| Samuel Vazquez | SAV218@pitt.edu | Yuanyuan Chen, PhD & Ekaterina Lobanova, PhD |
| Kristin Wannemo | krw120@pitt.edu | Melanie Koenigshoff, MD, PhD |
| Gillian Williams | giw10@pitt.edu | Bharat Bhushan, PhD |

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|---|---|---|
| Jennifer Yan | JEY90@pitt.edu | Sandra Cascio, PhD |
| Tina Yang | jiy201@pitt.edu | Zachary Freyberg, MD, PhD |
| Tyler Yasaka | tyy4@pitt.edu | Paul Monga, MD |
| Hsuan Yeh | hsy15@pitt.edu | Henry Dong, PhD |
| Rebecca Zack | Zack.Rebecca@medstudent.pitt.edu | Charleen Chu, MD, PhD |
| Xiyun Zhang | XIZ327@pitt.edu | Christiano Alves, PhD |

## 14. CMP Alumni

The following list includes students who graduated from the CMP Graduate Program beginning with the 2006–2007 academic year.

### 2025–2026

| | | |
|---|---|---|
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