



UNIVERSITY *of* MARYLAND  
SCHOOL OF MEDICINE

GRADUATE PROGRAM IN LIFE SCIENCES

# **Cellular & Molecular Biomedical Sciences MS**

## **Student Handbook**

### **2018-2019**

Graduate Program in Life Sciences  
CMBS MS - Program Handbook



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## UMB Academic Calendar 2018-2019

<https://www.umb.edu/registrar/academic-calendar/>



### Academic & Registration Calendar 2018-2019

Summer 2018			
	Registration Begins	Registration Ends	Instruction Begins
Dentistry	April, 2018	May 30	May 31
Dental Hygiene	April, 2018	May 30	May 31
Graduate	April, 2018	May 30	May 31
Medical Technology	April, 2018	May 30	May 31
Nursing	April, 2018	June 1	June 4
Pharmacy	April, 2018	May 30	May 31
Physical Therapy, Years 1 & 2	April, 2018	May 25	May 29
Physical Therapy, Year 3	April, 2018	May 25	July 16
Public Health	April, 2018	May 20	May 21
Social Work	April, 2018	May 29	May 30

Memorial Day	May 28, 2018 (Monday)
Graduation Application Deadline	June 10, 2018 (Sunday)
Independence Day	July 4, 2018 (Wednesday)
Term Ends; Graduation Date	July 27, 2018 (Friday)

Fall 2018			
	Registration Begins	Registration Ends	Instruction Begins
Dentistry, Years 1 & 2	April, 2018	August 19	August 20
Dentistry, Year 3	April, 2018	May 28	May 29
Dentistry, Year 4	April, 2018	May 20	May 21
Dental Hygiene, Entry Level I	April, 2018	August 19	August 20
Dental Hygiene, Entry Level II	April, 2018	July 8	July 9
Dental Hygiene, Degree Completion	April, 2018	August 19	August 20
Dental Postgraduate	April, 2018	July 4	July 5
Graduate	April, 2018	August 26	August 27
Law, MSL	April, 2018	August 26	August 27
Law, All Others	April, 2018	August 26	August 27
Medicine, Year 1	April, 2018	August 8	August 9
Medicine, Year 2	April, 2018	August 12	August 13
Medicine, Years 3 & 4	April, 2018	July 8	July 9
Medical Technology	April, 2018	August 26	August 27
Nursing	April, 2018	August 24	August 27
Pharmacy	April, 2018	August 27	August 27
Physical Therapy, Year 1	April, 2018	August 1	August 27
Physical Therapy, Year 2	April, 2018	August 1	August 20
Physical Therapy, Year 3	April, 2018	August 1	October 8
Public Health	April, 2018	July 29	July 30
Social Work	April, 2018	August 24	August 27

Labor Day	September 3, 2018 (Monday)
Graduation Application Deadline	September 9, 2018 (Sunday)
Thanksgiving Recess	November 22-25, 2018 (Thursday-Sunday)
Term Ends; Graduation Date	December 21, 2018 (Friday)



<b>Winter 2019</b>			
	<b>Registration Begins</b>	<b>Registration Ends</b>	<b>Instruction Begins</b>
All Schools and Programs	November, 2018	January 2	January 2

MLK Jr. Day January 21, 2019 (Monday)  
 Term Ends January 22, 2019 (Tuesday)

<b>Spring 2019</b>			
	<b>Registration Begins</b>	<b>Registration Ends</b>	<b>Instruction Begins</b>
Dentistry, All Years/Programs	November, 2018	January 2	January 2
General Counseling	November, 2018	January 22	January 23
<b>Graduate</b>	<b>November, 2018</b>	<b>January 22</b>	<b>January 23</b>
Medicine, Year 1	November, 2018	January 22	January 23
Medicine, Year 2	November, 2018	February 11	February 12
Medicine, Years 3 & 4	November, 2018	January 8	January 7
Medical Technology	November, 2018	January 21	January 22
Nursing	November, 2018	January 25	January 28
Pharmacy	November, 2018	January 22	January 22
Physical Therapy, Years 1 & 2	November, 2018	January 1	January 2
Physical Therapy, Year 3	November, 2018	January 1	January 14
Public Health	November, 2018	January 1	January 2
Social Work	November, 2018	January 18	January 22

MLK Jr. Day January 21, 2019 (Monday)  
 Graduation Application Deadline February 10, 2019 (Sunday)  
 Spring Break March 17-24, 2019 (Sunday-Sunday)  
 Term Ends May 17, 2019 (Friday)  
 Commencement/Graduation Date May 17, 2019 (Friday)

**NOTE: Consult with your school or program for specific registration dates and times.**

## **Leadership & Key Contacts**

### **Graduate Program in Life Sciences Leadership**

**Dudley Strickland, PhD**

Associate Dean for Graduate and Postdoctoral Studies  
Director, Center for Vascular and Inflammatory Diseases  
Professor, Department of Surgery  
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**Sharron Graves, MS**

GPILS Program Administrator  
[sgraves@som.umaryland.edu](mailto:sgraves@som.umaryland.edu)

### **Cellular & Molecular Biomedical Sciences MS Program Leadership**

**Frank Margolis, PhD**

Program Director  
HSF II S203D  
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**Elice García-Baca**

Academic Program Specialist  
BRB Room 1-005D  
Phone: (410) 706-6042  
[egarcia-baca@som.umaryland.edu](mailto:egarcia-baca@som.umaryland.edu)

### **Cellular & Molecular Biomedical Sciences MS Program Office**

Bressler Research Building, Room 1-005D  
655 W. Baltimore Street  
Baltimore, MD 21201  
Fax: 410-706-6040  
<http://lifesciences.umaryland.edu/CMBS/>

## Welcome

These guidelines are intended to supplement the regulations of the Graduate School of the University of Maryland, Baltimore (UMB) and the Graduate Program in Life Sciences (GPLS). Items covered in this handbook are subject to change, and all questions should be directed to the Program Specialist.

Students are strongly encouraged to become familiar with the policies outlined on the Graduate School's website at <http://www.graduate.umaryland.edu>, and on the GPILS website at <http://lifesciences.umaryland.edu>. Additional regulations and expectations described in this handbook are program-specific and are designed to answer most questions students may have regarding the program and course of study.

## Overview of the Cellular & Molecular Biomedical Sciences (CMBS) MS Program

The Cellular and Molecular Biomedical Science (CMBS) MS program at the University of Maryland emphasizes medically-relevant scientific research and education, utilizing state-of-the-art resources. The program is designed as a 2-year curriculum for full-time students, but may be completed over 5 years for part-time, working students. Students will become fluent in the study and implementation of biomedical research and will be well-prepared as skilled researchers for careers in academic research centers, government, and industry, including biotechnology firms and pharmaceutical companies, or for advanced study leading to PhD or MD degrees.

### Program Description

Cellular and Molecular Biomedical Science combines traditional areas of biomedical study, including cancer biology, human genetics, molecular and cell biology, pathology, pharmacology, neuroscience, and physiology into a unique interdisciplinary graduate training program. Specifically designed to develop scientists for the post-genomic era, CMBS-MS students will gain knowledge, research skills, and familiarity with the state-of-the-art biomedical tools and methodologies to solve important and timely questions in biomedical science.

The CMBS MS Program is a flexible program tailored to the needs of individual students. It provides graduate training to prepare students to continue their studies in PhD programs, Medical School, Dental School, or other professional programs or for positions such as laboratory managers and skilled technicians. Students may select either a thesis or non-thesis option.

Graduates will also be prepared to fill the increasing demand for skilled laboratory managers and basic and translational scientific researchers in academic research centers, government, and industry, including biotechnology firms and pharmaceutical companies. This program is

also a great option for current industry employees and professional degree holders (MD, RN, PharmD, DDS) looking to advance their careers in the field of contemporary research.

For more information, please visit our website using the following link:  
<http://lifesciences.umaryland.edu/CMBS/>.

### **Expectations of Students**

As a student in the CMBS MS program, you are part of a professional community of scientists. Your training will provide numerous opportunities for scientific collaboration and personal interaction with other scientists both within and outside of the program. Following are expectations for conduct that apply to all members of our community, including students. Adhering to these expectations promotes a productive and positive experience for all members of our community.

#### **Professionalism**

- Maintain a high level of professionalism at all times in terms of communication, behavior and dress.
- Treat all faculty, staff and fellow students with respect.
- Keep your physical surroundings clean and in order. If you are sharing space (e.g., classrooms) or equipment (e.g., computers) with other individuals, always leave the area neat, clean and secured.
- Communicate concerns about the program in a respectful and professional manner.

#### **Responsiveness**

All communications will be sent to your University of Maryland email account. Reply promptly to email from faculty and administrative staff.

- Notify Program Director, academic specialist, course instructors, and mentors if there is a change in your email address or other contact information.
- Post a vacation message when you will be away from your email for more than 24 hours.
- Respond promptly to requests for information.

#### **Attendance**

Attend scheduled classes, meetings, and departmental seminars/journal clubs.

- Inform instructors if you must miss a class.
- Arrange a weekly schedule and a vacation schedule with your rotation (or thesis research) mentor.

### **Expectations of Advisors & Mentors**

The role of the Academic Advisor, the Program Director and the Academic Specialist is to serve as a resource for students on academic matters helping them assimilate into the program,

make course selections, identify prospective rotations, and choose a research topic and dissertation mentor. Specific expectations and guidelines for student advising are as follows:

### **Time Commitment and Availability**

The academic advisor should have regular contact with the student(s) he or she is advising. At a minimum, advisors should meet with advisees once per semester. Advisors should also be available for student questions during the semester in person or by email or telephone.

### **Course Planning and Selection**

The academic advisor should assist their student(s) with course selection and planning. Course descriptions can be found in the Graduate School Catalog at <http://www.graduate.umaryland.edu/catalog/>. For information on courses offered in each semester, the best resource is SURFS at [https://surfs.umaryland.edu/SIMS/bwckschd.p\\_disp\\_dyn\\_sched](https://surfs.umaryland.edu/SIMS/bwckschd.p_disp_dyn_sched).

Course requirements for the academic program and a list of suggested electives can be found in on [page 12](#) of this handbook.

### **Student Progress**

Advisors will be familiar with their students' timelines and milestones so that they can provide guidance and assess each student's progress in courses, rotations, and identification of a research topic and advisor. The steps to completing the MS degree is detailed in this handbook.

### **Assistance in Identifying Rotations and Research Advisors**

Many students, especially those not familiar with our department or campus, will be unaware of possible opportunities for research rotations. The advisor should help the student focus his or her interests and suggest possible opportunities or faculty members who could serve as rotation mentors and/or research advisors.

## **Summary of Graduation Requirements**

- All students must maintain a minimum cumulative GPA of 3.0 to meet academic standards.
- A minimum of 30 credits are required for graduation. Students must complete the required courses and the curriculum as detailed in the [CMBS MS Curriculum](#) section.
- All students must enroll in, and complete, CIPP 907 Research Ethics.

**Please Note:** A repeated course may only count once toward the 30-credit requirement.

Classes taken for audit do not count towards the 30-credit requirement for graduation.

*Special Note on Courses Taken at UMB While Not Formally Matriculated as a CMBS MS Degree Seeking Student:* A limited number of course credits taken at University of Maryland, Baltimore prior to matriculation into the CMBS MS Program (e.g. 6 as a non-degree student) may be

applied toward the 30 total credits, provided the credits were completed not more than 5 years prior to the date of matriculation into the CMBS MS Program.

### **Academic Standards**

The CMBS MS program follows standard Graduate School performance requirements regarding minimum grade point average, continuous enrollment, time to degree and academic integrity.

Students in the MS Program are required:

- To maintain a cumulative grade point average of 3.0 on a 4.0 scale. Final letter grades are assigned using a plus or minus grading system.
- Students must register every fall and spring semester, unless on an approved Leave of Absence.
- A Leave of Absence (LOA) must be approved by the Program Director.
- All requirements for the MS degree must be completed within five years after matriculation.

All students are expected to meet the highest standards of integrity. For further details, please visit the Graduate School website on Academic Performance and Progress in Master of Science Programs at <https://graduate.umaryland.edu/Policies/>.

## **Curriculum and Program of Study**

### **CMBS MS Curriculum**

The CMBS MS program requires a minimum of 30 semester credits. Depending on the preference of the student there is a non-thesis and a thesis option of study.

#### **Non-Thesis Option: Required Courses**

The non-thesis option consists of a range of 14-19 credits in required courses that include laboratory rotations and focused course work. The remaining credits are to be fulfilled with elective courses approved by the Program Director, who serves as the non-thesis student's academic advisor. Each CMBS MS student will be provided an individualized Program of Study that will focus on their educational and professional goals.

<b>Course Number</b>	<b>Course Name</b>	<b>Credits</b>
CIPP 907.01	Research Ethics	1
<b>Choose one</b>		
GPLS 600.01	Cellular & Molecular Basis of Translational Research	5-8
GPLS 601.01	Mechanisms in Biomedical Science (Core Course)	
GPLS 609.05	Lab Rotations CMBS MS	4-6
GPLS 630.01	Fundamentals of Biostatistics	3

<b>Choose one</b>		
GPLS 690.01	Current Topics in Vascular & Stem Cell Biology	1
GPLS 691.01	Molecular Neuroscience & Biophysics	
GPLS 692.01	Current Topics in Genome Biology	
<b>Total for Non-Thesis Option</b>		<b>14-19</b>

### Thesis Option: Required Courses

The thesis option is a research-based program in which the student selects a mentor and undertakes a research project culminating in a written thesis and public seminar. The thesis option consists of a range of 20-26 credits in required courses that include laboratory rotations and focused course work. The remaining credits are to be fulfilled with elective courses approved by the Program Director. Each CMBS MS student will be provided an individualized Program of Study that will focus on their educational and professional goals.

**Please Note:** Thesis students must be registered for at least 1 credit of course work in the final semester that they defend their thesis.

Course Number	Course Name	Credits
CIPP 907.01	Research Ethics	1
<b>Choose one</b>		
GPLS 600.01	Cellular & Molecular Basis of Translational Research	5-8
GPLS 601.01	Mechanisms in Biomedical Science (Core Course)	
GPLS 609.05	Lab Rotations CMBS MS	1-4
GPLS 630.01	Fundamentals of Biostatistics	3
<b>Choose one</b>		
GPLS 690.01	Current Topics in Vascular & Stem Cell Biology	1
GPLS 691.01	Molecular Neuroscience & Biophysics	
GPLS 692.01	Current Topics in Genome Biology	
GPLS 799.01	Master's Thesis Research	6
<b>Total for Thesis Option</b>		<b>17-23</b>

### Highly Suggested Courses

Courses that fall in this category are not required, but if offered students are highly encouraged to take them.

Course Number	Course Name	Credits
	Summer Bridge (Prior to Starting Program)	0

### Elective Courses

Suggested electives are listed below. If a student is interested in taking a course that is not listed below, they must have the course approved by the Program Director.

Course Number	Course Name	Credits
GPLS 616	Molecular Mechanisms of Signal Transduction	3
GPLS 624	Oncopharmacology	3
GPLS 645		
GPLS 665	Cancer Biology: From Basic Research to the Clinic	3
GPLS 701	Advanced Molecular Biology	3
GPLS 702	Basic Immunology	3
GPLS 709	Advanced Biochemistry	3
GPLS 716		
GPLS 717	Genomics of Model Species and Humans	2
GPLS 718		
GPLS 721	Microscopy Fundamentals and Modern Imaging Applications	2
GPLS 769	Advances in Immunology	2
GPLS 790	Advanced Cancer Biology	3
HGEN 601	Human Genetics I	4
PHAR 600	Principles of Drug Discovery	3
PHAR 601	Principles of Drug Development	3

*\*Course offered every other year.*

For course descriptions, faculty, and meeting times, please view the SURFS <http://www.umaryland.edu/surfs/>.

### **Registration**

The Program Specialist will register all new incoming students for their first semester courses. After successful completion of the first semester, all students are responsible for their own registration, unless a Leave of Absence has been approved.

### **The registration process is as follows:**

1. Meet with Program Director to discuss courses of interest and obtain approval.
2. Email list of approved courses to Program Specialist as student registration is locked by default.
3. When the Program Specialist has unlocked the student's registration, the student will be notified via email.

Students must then login to SURFS to complete the registration process **at least 6 weeks** before the start of the semester. Instructions detailing this process will be emailed to the student's university email account.

**Please Note:** If there is an outstanding balance on a student's account, he or she will not be able to register. This "hold" on the student's account must be taken care of by the student by contacting Students Accounts to pay their bill before they can register.

### **Non-degree Coursework**

The non-degree status is for students seeking to enhance their knowledge by completing one or more graduate courses, but who are not pursuing a degree. Should the student subsequently be admitted to the program, there is no assurance that credits earned as a non-degree student will be transferred. In cases where the program does grant such a request, no more than 6 credits will transfer for the degree.

### **Changing a Schedule or Course Registration(s)**

Students must register for coursework each fall and spring semester to maintain eligibility for a degree (registration is not required for summer or winter terms except under specific circumstances). Adjustments to course registrations should only be made prior to the start of the semester and should be undertaken in consultation with the students' instructors and/or advisors and Program Director. Following the start of the term, changes may only be made in accordance with stated Graduate School timetables. Further, students must file the necessary form(s) for registration changes with the appropriate university officials' signature(s) of approval before changes are complete or official.

#### **Adding a Course**

Week 1: Fall, spring or summer semester: Students may add course(s) through the end of Week 1 only. (Winter term: Students may add a course through the end of Day 2 only). Full refund will be given. Complete the Change in Registration Request form and obtain the necessary signatures.

#### **Dropping a Course**

Weeks 2 - 3: Fall, spring or summer semester: Students may drop course(s) through the end of week 3 with proper approvals and with no notation on their transcript (winter term, through end of day 2). Partial (80%) or no refund will be given depending upon the Drop date. Complete the Change in Registration Request form and obtain the necessary signatures.

#### **Withdrawing from a Course**

Weeks 4 - 8: Students may withdraw from a course(s) through the end of week 8 with instructor and advisor or Program Director approval. A notation of "W" will appear on the transcript. Withdrawn course(s) count as an attempt. No refund is given. Complete the Change in Registration Request form and obtain the necessary signatures.

Beginning the 9th week of the term (or from day 3 to end of winter term), students are not permitted to Drop or Withdraw from a course. The student must complete the course, negotiate/request an Incomplete, or request the instructor to grant a Withdraw Pass or Withdraw Fail (WP/WF). No refund is given. Complete the Change in Registration Request form and obtain the necessary signatures.

### *Withdraw Pass/Withdraw Fail*

If a course withdrawal is approved beginning 9 weeks after the start of a fall or spring semester course or after the first two weeks of a summer course, the student will receive a withdrawal mark of “WP” or “WF” for each course attempted. A withdrawal mark of “WP” means that the student was passing the course at the time of withdrawal and a withdrawal mark of “WF” means she or he was failing at the time of withdrawal. Each “WP” and “WF” mark will appear on the official transcript. “WP/WF” marks are not included in the calculation of semester, term or cumulative grade point averages. However, “WF” marks are included as course failures when determinations of academic probation or academic failure are made. There are no refunds for WP/WF marks. Completion of a signed, approved Course Withdrawal Request is required.

### *Incomplete*

Incomplete grades (“I”) are given under exceptional circumstance to a student who has made satisfactory progress in a course but, because of illness or other extenuating circumstances beyond their control, is unable to complete all the course requirements by the end of the semester. Students must complete coursework and faculty must assign a permanent letter grade within one year from the time the grade of I was issued. Incomplete grades not resolved within the designated timeframe will be converted to the grade of F. Students are ultimately responsible for completing coursework within the one-year period.

All forms are located on the Graduate School website at <http://graduate.umaryland.edu/Forms/>.

### **Waiving or Substituting Courses**

In exceptional circumstances, students may petition for a waiver or substitution of a required course if they can demonstrate and document that they have previously acquired the required course competencies. If a waiver or substitution is granted, 30 credits are still required for graduation. The documentation necessary to grant a waiver or substitution will require the name/title of the previous course(s), instructor(s), textbook(s), summary of course syllabus, and grade(s) received. In addition, waiving or substitution a required course me include an examination.

A request for a required course waiver/modification must be submitted early – at the start of the academic program, whether full-time or part-time.

If a student would like to request a waiver or substitution of a required course, please contact the CMBS MS Program Specialist to initiate the process.

## **Academic Policies and Procedures**

### **Cancellation of Registration - Withdrawal**

Registered students compelled to leave the university before the start of a given term must file a letter of cancellation of registration with the Graduate School. Failure to file this letter and to obtain approval by the Graduate School will result in loss of refund. Once the semester begins students are subject to the other schedule adjustment guidelines, policies and procedures (Add/Drop, Withdrawing, etc.) cited above.

### **Leave of Absence**

Students who wish to continue in a degree program, but cannot study in a specific semester or year, must take a leave of absence with the approval of their Program Director and the Graduate School. Students must complete a Leave of Absence Request form and present it to their Program Director and to the Graduate School for approval.

The Graduate School notifies students of leave approvals and of the terms of re-enrollment. While there is no minimum number of times a student may request a leave of absence, leaves do not extend the time required to complete degree requirements. Completion of a signed, approved Leave of Absence (LOA) Request is required.

All forms are located on the Graduate School website at <http://graduate.umaryland.edu/Forms/>.

### **Academic Misconduct**

Fabrication, falsification, plagiarism, cheating, improprieties of authorship, facilitating academic dishonesty or any other type of academic misconduct will not be tolerated. Students pursuing a CMBS MS are expected to maintain academic integrity and honesty at all times. Please refer to the Graduate School policies regarding academic misconduct at <http://www.graduate.umaryland.edu/policies/>.

### **Academic Dismissal**

Students must have a cumulative average GPA of 3.0 to graduate. Any student finishing an academic semester with a GPA of less than 3.0 will be placed on academic probation and be required to submit a remediation plan to the Program Director and the Graduate School. The Graduate School may dismiss students whose average GPA is low enough that achieving a 3.0 is highly unlikely. CMBS MS students will not be dismissed for grades of B- or below in the Core Course, unless the semester GPA is significantly lower than 3.0 and it is unlikely the student will recover.

### **Course Grade Appeal Procedure**

The Graduate School provides students with a mechanism for reviewing course grades alleged to be arbitrary or capricious. If a student receives a grade that he or she feels does not reflect performance in the course, please review the Graduate School policies listed at <http://www.graduate.umaryland.edu/policies/>.

### **Ombuds Committee**

The Ombuds Committee was created by the Graduate School for resolving disagreements between a graduate student and the graduate program with which he or she is involved. The CMBS MS program encourages students to use the mediation services of the Ombuds Committee if they become involved in a dispute that cannot be successfully resolved at the program level. A step-by-step list of procedures for utilizing the Ombuds Committee can be found at <http://www.graduate.umaryland.edu/policies>.

### **Appeal of Academic Dismissal**

The CMBS MS program abides by Graduate School policies for appeal of academic dismissal, which can be found at <http://www.graduate.umaryland.edu/policies/>.

## **Laboratory Rotations**

Research rotations provide students with opportunities to 1) learn how to function and flourish in a research setting; 2) learn a specific skill (e.g., laboratory technique, statistical method) necessary for thesis or continued lab work.

### **Expectations and Opportunities**

Rotations are a time of learning and growth, and the more time and energy students put into them, the more they will learn in terms of new knowledge and expanding research and career opportunities. During the rotation(s), students will work on projects that are mutually beneficial to the mentor and student.

To maximize the benefits of a rotation(s) it is suggested that students:

- 1) Agree upon a project and expectations with their mentor at the outset
- 2) Pay careful attention to what is going on in the research setting regarding his or her specific project and in general
- 3) Work hard
- 4) Work independently and collaboratively
- 5) Ask questions when they need help
- 6) Review readings recommended and/or assigned by the mentor, and those obtained through inspired literature searches.
- 7) Maintain **regular** communication with the mentor to discuss any challenges and outcomes that may occur while engaged in research.

### **Selection Process**

The selection of rotations is made by the student in collaboration with Program Director and are based on the student's needs and interests. Thus, students who have already identified their area of interest are encouraged to reach out directly with one or more potential mentors. Students who do not yet have a preferred research area should continue working with the Program Director prior to reaching out potential mentors.

## **Forms & Processes**

Fillable electronic lab rotation forms are located at <http://lifesciences.umaryland.edu/CMBS/Student-Resources/> and samples of the forms are shown in [Appendix C: Lab Rotation Forms](#). Every Lab Rotation requires three forms to be submitted to the Program Specialist:

1) ***CMBS Lab Rotation Proposal Form***

This form is to be completed by the student with input and collaboration from the mentor. The form is reviewed and signed by the mentor and Program Director, before submitting the signed form to the Program Specialist and **prior** to starting the rotation.

2) ***CMBS Lab Rotation Completion Form***

Upon completion of the lab rotation, the student completes this form which provides a synopsis of the lab experience. The form is reviewed and signed by the Program Director, before submitting the signed form to the Program Specialist. Form must be submitted within 10 days of completing the lab rotation.

3) ***CMBS Lab Rotation Evaluation & Grade Form***

The mentor is required to complete an evaluation of the work performed by the student, for the student to receive credit. Once the form is completed, the mentor will submit the form to the Program Specialist.

## **Responsibilities of the Lab Rotation**

### **Environmental Health and Safety – Lab Safety Training**

All students (full-time and part-time) working in a laboratory are required to attend initial laboratory safety training and maintain annual training. For more information on the training and a schedule of sessions, please visit the EHS site <http://www.umaryland.edu/ehs/training/>.

### **Student**

The student is expected to take an active part in the lab rotation and research opportunities. This is important, as it also prepares students for acquiring skills needed to obtain a job or further academic advancement upon graduation. Finally, students should have a high level of professionalism when communicating with the mentors and colleagues during the lab rotation.

During the lab rotation, the student needs to be in regular contact with the mentor and in some cases, the Program Director. It is also necessary to inform the Program Specialist regarding any plans or concerns a student has for securing a lab rotation.

### **Mentor**

The mentor supervises the student's progress in completing all goals, objectives, and associated activities throughout the lab rotation. In addition, the mentor should be available to meet with the student on a regular basis and, when necessary, advise the Program Director of any problems that arise.

The mentor is required to submit an evaluation and grade of the student's performance upon completion of the lab rotation.

## **Thesis**

The CMBS MS thesis is a graduation requirement for students that have elected the Thesis option for their program of study. Students are required to enroll in GPLS 799.01 Master's Thesis Research for 6 credits. Students will work with their thesis advisor to choose a course of study that forms a coherent structure and provides advanced expertise in the chosen area of emphasis.

### **Mentor**

Students choosing to pursue the thesis option will select a research mentor. The mentor will guide all aspects of the research program, assist in course selection, and advise the student in their thesis preparation and presentation. The Program Director will advise the student as needed, in addition to approving all necessary paperwork that must be submitted by the student.

Mentors may be selected throughout the University and must be a member of the Graduate Faculty. The Program Director is recognized by the University as the student's academic advisor, so in rare cases off-campus mentors may be chosen. In this case, the student should arrange to have the mentor's CV forwarded to the Program Director for approval.

The GPILS website is a great resource for a researching potential mentors <http://lifesciences.umaryland.edu/about/Faculty--Staff/Graduate-Program-Faculty/>. It is **strongly** recommended that students begin the process of identifying a thesis mentor in their first semester and arrange a laboratory rotation for the start of their second semester.

### **Thesis Project**

The research undertaken as part of the thesis is guided by the thesis mentor and the student. In most cases, the mentor will provide substantial input into the project goals and design. It is important that the student and mentor design a project that is consistent with the time frame of the CMBS MS degree, i.e., 2-3 semesters of dedicated research time.

### **Thesis Proposal**

The CMBS MS program does not have a strict requirement for a thesis proposal. However, it is strongly recommended that students write a short proposal of the thesis research, which should include:

- Introduction
- Hypothesis
- Methods
- Preliminary results as appropriate

- Timeline

The thesis proposal should be filed with the Program Specialist, Program Director and thesis committee.

### **Thesis Committee**

The thesis committee should consist of 3-5 members, including the thesis mentor. At least one member of the committee must be a regular member of the Graduate Faculty, all faculty are listed on the Graduate School website at <https://www.graduate.umaryland.edu/About/Faculty-and-Staff/Graduate-Faculty/>.

The committee should be selected as early as possible and certainly as soon as a potential thesis project has been selected. Committee members should be selected by the student and the thesis mentor who are able to assist the student in aspects of their thesis research. The names of the thesis committee should be forwarded to the Program Director as soon as available and formally filed with the Graduate School using the *Nomination or Members for the Final Master's Examination Committee* form, located at <https://www.graduate.umaryland.edu/Forms/>.

It is expected that the student will meet with the committee at least once a semester to evaluate progress and provide advice and input.

### **Thesis Requirements**

The thesis does not have a specified length or page requirement. However, the written document should be complete and follow the guidelines set forth by the Graduate School using the Thesis and Dissertation Style Guide <https://www.graduate.umaryland.edu/Current-Students/Information-for-Graduating-Students/>. CMBS MS theses are filed electronically, although it is appropriate to provide the mentor and members of the thesis committee a bound hard copy.

A finished draft of the thesis should be provided to the committee at least 4 weeks before the scheduled seminar. The committee will determine if the thesis is defensible and provide feedback and suggestions for the final written document. If the thesis is deemed indefensible, the student must address the issues raised by the committee before moving forward on the thesis.

### **Final Exam**

The final exam consists of a public seminar and a closed oral exam.

#### **Public Seminar**

The public seminar should be scheduled upon confirmation by the committee that the thesis is defensible and publicized through the Program Director. CMBS MS thesis seminars are about 40 minutes in length, followed by questions from the audience.

### Oral Exam

The oral exam is closed to the public and includes only the thesis committee. One member of the committee will be assigned as the Dean's representative and be responsible for communicating the results of the final exam to the graduate school, as well as serving as the chair of the committee. The oral exam should not exceed 2 hours in length, and specific guidelines for all aspects of MS theses exams are provided at <https://www.graduate.umaryland.edu/Forms/> under the heading Graduation and Degree Certification Forms.

### Final Approved Thesis

Upon successful defense, a copy of the final thesis should be submitted to the Program Director and the Academic Specialist.

## Graduation

At the beginning of the semester during which a student plans to graduate, he or she should consult the Graduate School Academic Calendar and deadlines <http://www.graduate.umaryland.edu/Current-Students/Academic-Calendar-and-Deadlines/> as well as <http://www.graduate.umaryland.edu/Forms/> for the current forms and deadlines.

**Please Note:** students must be registered for at least one credit in the semester during which he or she plans to graduate, including summer and winter semesters.

If a student misses the application for graduation, they will have to wait until the next graduation cycle. No exceptions.

## Finances

Tuition and fee information can be located at <http://www.umaryland.edu/financialservices/student-accounting/tuition-and-fees-by-school/>. The CMBS MS program does not offer stipends, scholarships, or assistantships. Faculty mentors **ARE NOT** required to provide payment for MS students in their laboratories. You must make this clear when approaching faculty members in pursuit of a lab rotation or thesis research with them. You may be eligible for financial assistance and should consult the UMB Office of Financial Aid at <http://www.umaryland.edu/fin/> for additional information.

For student employment opportunities, please refer to <https://www.umaryland.edu/fin/student-employment/> for more information. In specific circumstances, students may be employed on campus as, for example, laboratory technicians.

## International Students

The Office of International Services will assist international students with document processing and facilitate visa services and support. Additional information may be obtained at <https://www.umaryland.edu/ois/>. International student support may also be obtained from <https://www.umaryland.edu/services/international-services/>.

## Applying to GPILS PhD Programs

The CMBS program does not transfer students into GPILS PhD programs. Rather, students must submit a complete application with all required documentation, including application fee by the scheduled deadlines. To be eligible to apply to any of the GPILS PhD programs, MS students must achieve a grade of B or better in GPLS 601 Mechanisms in Biomedical Sciences (Core Course).

## Appendix A: Sample Program of Study

Each student admitted to the program will receive a Program of Study (PoS). This is a guide, and assists in planning course enrollment. For example, below is what a full-time PoS looks like for a student that is planning on completing the degree:

- In 2 Years
- While taking 9 credits per semester
- With the thesis option

Course Number	Course Name	Credits	Designation
<b>Summer, Prior to Program Start</b>			
	Summer Bridge		Suggested
GPLS 609.05	Lab Rotations CMBS MS	1	Required
<b>Fall, Semester 1/Year 1</b>			
GPLS 601.01	Mechanisms in Biomedical Science	8	Required
GPLS xxx.xx	Required Course (GPLS 690, GPLS 691, or GPLS 692)	1	Required
<b>Thesis Option: Identify/contact possible research mentors.</b>			
<b>Spring, Semester 2/Year 1</b>			
GPLS 609.05	Lab Rotations CMBS MS	2	Required
GPLS xxx.xx	Elective Course	3	Elective
GPLS xxx.xx	Elective Course	3	Elective
CIPP 907.01	Research Ethics	1	Required
<b>Thesis Option: Confirm research mentor as early as possible.</b>			
<b>Summer</b>			
<b>Thesis Option: Work on thesis proposal.</b>			
<b>Fall, Semester 3/Year 2</b>			
GPLS 630.01	Fundamentals in Biostatistics	3	Required

GPLS xxx.xx	Elective Course	3	Elective
GPLS xxx.xx	Elective Course	3	Elective
<b><i>Thesis Option: Research and thesis committee meeting.</i></b>			
<b>Spring, Semester 4/Year 2</b>			
GPLS xxx.xx	Elective Course	3	Elective
GPLS 799.01	Master's Thesis Research	6	Required
<b><i>Thesis Option: Research and thesis preparation. Thesis defense prior to graduation.</i></b>			

For part-time students, it is suggested that the required courses are taken upfront to ensure these have been met as early on as possible.

## Appendix B: Frequently Used Contacts and Phone Numbers

### UMB Graduate School

620 W. Lexington Street, 5th Floor  
Phone: 410-706-7132  
Fax: 410-706-3473  
[gradinfo@umaryland.edu](mailto:gradinfo@umaryland.edu)  
<http://graduate.umaryland.edu/>

### 24-hour National Graduate Student Crisis Line:

1-800-GRAD-HLP

### Office of International Services:

Gina Dreyer  
[gdreyer@umaryland.edu](mailto:gdreyer@umaryland.edu)  
SMC Campus Center, Suite 302  
621 W. Lombard Street  
Phone: 410-706-3171

### American Association for Cancer Research (AACR):

Phone: 215-440-9300  
Toll Free: 1-866-423-3965  
Fax: 215-440-9313  
Email: [aacr@aacr.org](mailto:aacr@aacr.org)  
<http://www.aacr.org/>

### Counseling Center

Emilia K. Petrillo, LCSW-C  
Executive Director  
[epetr001@umaryland.edu](mailto:epetr001@umaryland.edu)  
601 W. Lombard St., Suite 440  
Phone: 410-328-8404  
Hours: Monday-Friday, 8:30 AM to 5:00 PM  
Website: <http://www.umaryland.edu/counseling/>

### Writing Center

Isabell C. May, PhD  
Director  
[imay@umaryland.edu](mailto:imay@umaryland.edu)  
621 W. Lombard St., Suite 307  
Phone: 410-706-7725  
Hours: Monday-Friday, 10:00 AM to 4:00 PM  
Saturday, 10:00 AM to 2:00 PM  
Website: <http://www.umaryland.edu/counseling/>

**Graduate Student Association (GSA):**

You are encouraged to participate in the GSA, which offers special services for graduate students, including grants for lab supplies, travel fellowships, and use of laptop computers. If you are interested in becoming an active member or representative in the GSA, please email them at [gsa@umaryland.edu](mailto:gsa@umaryland.edu) for further information.

GSA website: <http://graduate.umaryland.edu/gsa/>

GSA President email: [umb.gsa.president@gmail.com](mailto:umb.gsa.president@gmail.com)

GSA Public Affairs email: [umb.gsa.pro@gmail.com](mailto:umb.gsa.pro@gmail.com)

## Appendix C: Lab Rotation Forms

### CMBS Lab Rotation Proposal Form



UNIVERSITY of MARYLAND  
SCHOOL OF MEDICINE

Cellular & Molecular Biomedical Science  
MS Program

GRADUATE PROGRAM IN LIFE SCIENCES

#### CMBS Lab Rotation Proposal Form

**Prior to starting your lab rotation, please complete this form. It must be signed by the proposed mentor, the Program Director and returned to the Academic Program Specialist before the rotation begins. Your rotation will NOT be approved without this form!**

Student name:

Mentor name and title:

Proposed rotation dates: \_\_\_\_\_ to \_\_\_\_\_

Expected schedule for laboratory work:

The goals of this rotation are:

I expect to gain experience with the following techniques:

PLEASE NOTE: MS students do not receive a stipend; they do not require funding from their mentors. Mentors may hire MS students as laboratory technicians full or part-time at their own discretion. This is unrelated to the MS program.

Signatures:

Student: \_\_\_\_\_ Date: \_\_\_\_\_

Mentor: \_\_\_\_\_ Date: \_\_\_\_\_

Program Director: \_\_\_\_\_ Date: \_\_\_\_\_

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## CMBS Lab Rotation Completion Form



GRADUATE PROGRAM IN LIFE SCIENCES

Cellular & Molecular Biomedical Science  
MS Program

### CMBS Lab Rotation Completion Form

**This form is to be filled out and turned in within 10 days of lab rotation completion. It must be signed by the Program Director, and then turned in to the Academic Program Specialist.**

Student name:

Mentor name and title:

Rotation dates: \_\_\_\_\_ to \_\_\_\_\_

The goals achieved during this rotation were:

What did you learn from this experience?

Did you receive adequate training and guidance? Please explain:

Would you recommend this lab to other students? Please explain:

\_\_\_\_\_  
Signatures:

Student: \_\_\_\_\_ Date: \_\_\_\_\_

Program Director: \_\_\_\_\_ Date: \_\_\_\_\_

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## CMBS Lab Rotation Evaluation & Grade Form



Cellular & Molecular Biomedical Science  
MS Program

GRADUATE PROGRAM IN LIFE SCIENCES

### CMBS Lab Rotation Evaluation/Grade Form

**CMBS STUDENTS:** Complete the top portion of this form and provide it to your mentor immediately upon completion of your lab rotation.

Student name:

Mentor name and title:

Rotation dates: \_\_\_\_\_ to \_\_\_\_\_

Credits (1-3): \_\_\_\_\_

**MENTORS:** Please turn in the grade for your lab rotation students within 10 days of rotation completion to the CMBS Academic Program Specialist.

Email: [egarcia-baca@som.umaryland.edu](mailto:egarcia-baca@som.umaryland.edu)  
Office: BRB 1-005D

Please rate the student's performance on a scale of 1=Excellent to 5=Poor

	Research ability and potential
	Written and/or verbal communication skills
	Perseverance and independence
	Laboratory ability
	Originality
	Accuracy

Please provide a summary of the student's performance.

Would you accept this student for a Thesis Project or as an employee in your lab?  Yes  No

Grade (Pass/Fail): \_\_\_\_\_

Signature: \_\_\_\_\_

Mentor: \_\_\_\_\_ Date: \_\_\_\_\_

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