MASTER’S & CERTIFICATE PROGRAMS

Graduate Handbook
INTRODUCTION

This handbook summarizes the graduate student requirements for the Master of Science degree in Cellular and Molecular Medicine (CMM) and the Graduate Certificate in Biomedical Sciences. It is meant to assist students in understanding and fulfilling CMM program requirements. However, it is not all-inclusive and does NOT serve as a contractual document. Students should also utilize resources made available by the Graduate College. The Advisor and the Thesis Committee will serve as guides and mentors. The Graduate Studies Director and the Master’s Oversight Committee will also provide guidance and oversee student progress. It is important for students to realize that successful completion of a Master’s Degree or Certificate Program in CMM is their responsibility. Each student must be focused and self-motivated to reach his/her goals.

TABLE OF CONTENTS

INTRODUCTION .................................................................................................................. 2
TABLE OF CONTENTS ....................................................................................................... 2
MASTER OF SCIENCE (M.S.) PROGRAM ................................................................. 3
  Objectives ....................................................................................................................... 3
  Administration ............................................................................................................... 3
  Application Materials ................................................................................................... 3
  International Applicants ............................................................................................... 4
  Financial Support .......................................................................................................... 4
  Coursework for the CMM-M.S. track ........................................................................... 4
  Coursework for the CMM-M.S.-Medical Track ............................................................ 5
  Information for both CMM M.S. Tracks ...................................................................... 5
  Advisor and Advisory Committee ................................................................................. 5
  GradPath ....................................................................................................................... 6
  Thesis ............................................................................................................................. 6

GRADUATE CERTIFICATE IN BIOMEDICAL SCIENCES ............................................. 6

ACADEMIC INTEGRITY ................................................................................................. 9

ADDITIONAL INFORMATION ....................................................................................... 9
  Student Roles in Program Governance ..................................................................... 9
  Student Resources ........................................................................................................ 9
  Satisfactory Academic Progress and Student Appeals .............................................. 10
MASTER OF SCIENCE (M.S.) PROGRAM

Objectives
This Master’s program is designed to educate students at the graduate level in biomedical sciences, with an emphasis on training in basic and translational clinical research, and to provide students with an advanced understanding of human anatomy and functional histology and cell biology.

Administration
The CMM Graduate Certificate and Master’s Advisory Committee, with the approval of the Department Head, administers all aspects of the graduate program including recruiting, admissions, setting of policy, student advising, approval of Thesis, and other matters relevant to graduate education. Dr. Lonnie Lybarger (lybarger@email.arizona.edu) is the Committee Chair and serves as the Graduate Advisor and Director of Graduate Studies of the program. Administrative support is provided by Barbara Kahn-Sales, Program Coordinator (bkahnsales@email.arizona.edu; 626-6655).

<table>
<thead>
<tr>
<th>Title</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Director</td>
<td>Lonnie Lybarger, Ph.D.</td>
</tr>
<tr>
<td>Department Head</td>
<td>Carol Gregorio, Ph.D.</td>
</tr>
<tr>
<td>Master’s Advisory</td>
<td>Herman Gordon, Ph.D.; Paul Krieg, Ph.D.; Lonnie Lybarger, Ph.D.; Jean Wilson, Ph.D.; Diana Darnell, Ph.D.; Clark Lantz, Ph.D.</td>
</tr>
<tr>
<td>Committee Members</td>
<td></td>
</tr>
<tr>
<td>Graduate Program Coordinator</td>
<td>Barbara Kahn-Sales, M.Ed</td>
</tr>
</tbody>
</table>

Application Materials
Students interested in pursuing a M.S. in Cellular and Molecular Medicine must apply through the University of Arizona Graduate College. Please visit the CMM website for additional information about the admissions process and to initiate an application. Note that admission to the M.S. – Medical Science Track is through a separate mechanism.

The following items are required for upload as part of the application process:
1. Transcripts of all college and university work.
2. GRE results (general exam is required, and subject exam is optional) or MCAT results
3. Statement of Purpose, explaining the reasons for pursuing graduate education, including past experiences and future goals.
4. Contact information for at least three people willing to write a letter of recommendation on your behalf. You should select individuals who are familiar with your work (one of these letters should be from your research advisor, if applicable). Potential letter writers will be contacted directly from the Graduate College with instructions on letter submission.
International Applicants

International applicants must demonstrate proficiency in spoken and written English. All Graduate Assistants (GA) whose native language is not English and who do not have a degree from a U.S. institution must have a minimum score of 550 (paper-based) or 213 (computer-based) on the Test of English as a Foreign Language (TOEFL) before their appointment as a GA.

A foreign student whose native language is not English must, within two years after entering the program, pass an English proficiency test (SPEAK or TSE test) with a score of 50 or higher.

Financial Support

The Cellular and Molecular Medicine CMM Master’s Program does not provide financial aid. However, students may contact the Financial Aid Office for assistance. The student is responsible for all expenses related to completion of the degree requirements.

Coursework for the CMM-M.S. track

The Master’s degree requires a minimum of 30 units of credit. Students must complete the courses below with a cumulative grade-point average of 3.0 or higher:

<table>
<thead>
<tr>
<th>CORE COURSES FOR CMM - MS Track:</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMM 501 (Human Gross Anatomy)</td>
<td>4</td>
</tr>
<tr>
<td>CMM 510 (Human Histology: an Introduction to Pathology)</td>
<td>3</td>
</tr>
<tr>
<td><strong>OR</strong></td>
<td></td>
</tr>
<tr>
<td>CMM 525a (Functional Human Histology)</td>
<td>4</td>
</tr>
<tr>
<td>CMM 565A (Fundamentals of Light Microscopy and Electronic Imaging)</td>
<td>3</td>
</tr>
<tr>
<td>CMM 577 (Principles of Cell Biology)</td>
<td>4</td>
</tr>
<tr>
<td><strong>OR</strong></td>
<td></td>
</tr>
<tr>
<td>CMM 504 (Cell Biology of Disease)</td>
<td>3</td>
</tr>
<tr>
<td>CMM 910 (Thesis)</td>
<td>5 units total</td>
</tr>
</tbody>
</table>

**CHOOSE ONE OF THE FOLLOWING:**

- CMM 603 (Current Topics in Biomedical Sciences)          | 2       |
- CMM 604 (Current Topics in Translational Medicine)       | 2       |

**CHOOSE ONE OF THE FOLLOWING:**

- PATH 515 (Mechanisms of Human Disease)                   | 4       |
- CBIO 552 (Cancer Biology)                                | 4       |

**ELECTIVES - SUGGESTED COURSES BELOW:**

- CMM 595H (Problems in the Biology of Complex Disease; 2 credits) | 2       |
- EPID 576A (Biostatistics in Public Health; 3 credits)          | 3       |
- CMM 605 (Medical Immunology and Infectious Disease; 4 credits) | 4       |

6 units total

The student will be required to complete at least 6 additional units with a grade of C or better. The courses listed above are suggestions, but reasonable and related courses outside of that list may also be acceptable.
Coursework for the CMM-M.S.-Medical Track

The Master’s degree requires a minimum of 30 units of credit.

Every student will be required to complete the following courses with a cumulative grade-point average of 3.0 or higher:

<table>
<thead>
<tr>
<th>CORE COURSES FOR CMM - Medical Track</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMM 501 (Human Gross Anatomy)</td>
<td>4</td>
</tr>
<tr>
<td>CMM 504 (Cell Biology of Disease)</td>
<td>3</td>
</tr>
<tr>
<td>CMM 510 (Human Histology: an Introduction to Pathology)</td>
<td>3</td>
</tr>
<tr>
<td>CMM 579 (The Art of Scientific Discovery)</td>
<td>3</td>
</tr>
<tr>
<td>CMM 604 (Current Topics in Translational Medicine)</td>
<td>2</td>
</tr>
<tr>
<td>CMM 605 (Medical Immunology and Infectious Disease)</td>
<td>4</td>
</tr>
<tr>
<td>CMM 696C (E= MC2 seminar)</td>
<td>2</td>
</tr>
<tr>
<td>PATH 515 (Mechanisms of Human Disease)</td>
<td>4</td>
</tr>
<tr>
<td>CPH 573a (Basic Principles of Epidemiology)</td>
<td>4</td>
</tr>
<tr>
<td>CMM 910 (Thesis)</td>
<td>5</td>
</tr>
</tbody>
</table>

Information for both CMM M.S. Tracks

Other courses in the biomedical sciences and medicine may be appropriate and will be considered. The student will be required to receive approval from his or her advisory committee for his/her final selection of courses.

A student must maintain an overall grade-point average (GPA) of 3.0. In accordance with the policies of the Graduate College, any student whose cumulative GPA falls below 3.0 will be on probation for the following semester. If the student’s cumulative GPA is still below 3.0 at the end of the probationary semester, he/she will be dismissed from the program.

Advisor and Advisory Committee

Each student will be assigned a member of the Master’s Oversight Committee as primary advisor when he or she accepts admission into the Master’s Program. The student’s advisory committee will consist of the primary advisor and at least two additional faculty members who have expertise related to the student’s area(s) of interest. The additional committee members will be chosen jointly by the student and the primary advisor. The members of the student’s advisory committee should be chosen, and the committee should meet, as soon as possible after the student enters the Master’s Program.

GradPath

There are many forms that must be submitted at various stages and milestones of the student’s graduate career. Many of these forms are completed online through the GradPath system hosted by the Graduate College. Please visit http://grad.arizona.edu/gsas/ to learn more.
about these forms and how to submit them. GradPath forms can be accessed through the Student Center in UAccess Student by clicking the dropdown menu in the Academics section.

Thesis

Every student is required to complete a substantial research project and to submit a written thesis that documents that research. Both laboratory, non-laboratory and hybrid projects will be considered. The student’s research project will be agreed upon by the student and the student’s advisory committee (to be made up of at least three faculty members, at least one of whom must be a member of the Master’s Advisory Committee). As a guideline, a laboratory-based thesis should be in the format of a publishable manuscript for an appropriate journal, and a non-laboratory-based thesis should be in the format of a New England Journal of Medicine review article and be 10,000-20,000 words (not including references). The student’s Thesis Committee will guide her/him in the preparation of the thesis. Per Graduate College policy, the thesis must be archived on the University’s open-access website.

Students who will be working in a laboratory must complete the University’s Online RCR Training (https://rgw.arizona.edu/research-compliance/rcr/online-training). It might be appropriate for students in laboratories to register for CMM 900 “research” units.

Students who will be working with patients or non-anonymized patient data must take the University’s HIPPA Training (https://rgw.arizona.edu/compliance/hipaa-privacy-program/hipaa-training).

GRADUATE CERTIFICATE IN BIOMEDICAL SCIENCES

This certificate program is designed to educate students at the graduate level in biomedical sciences, with an emphasis on training in basic and translational clinical research, and to provide students with an advanced understanding of human anatomy and functional histology and cell biology.

1. A bachelor’s degree is a prerequisite for entering the certificate program. A student may apply to the certificate program prior to receiving his/her bachelor’s degree, but must have received the degree before starting the certificate program. While it is expected that the applicant’s undergraduate major normally be in the natural sciences, students with degrees in other fields who have sufficient coursework in the natural sciences will be considered.

2. The certificate will require that the student complete a minimum of 12 units of credit, which can include up to 3 units of transfer credit as specified below.

   a. Every student will be required to complete the following courses with a cumulative grade-point average of 3.0 or higher:
COURSES FOR GRADUATE CERTIFICATE IN BIOMEDICAL SCIENCES | CREDITS
---|---
CMM 501 (Human Gross Anatomy) | 4
CMM 510 (Human Histology: an Introduction to Pathology) | 3
**OR**
CMM 525a (Functional Human Histology) | 3
CMM 565A (Fundamentals of Light Microscopy and Electronic Imaging) | 4

**ONE ADDITIONAL COURSE** (to be completed with a grade of C or higher) | CREDITS
---|---
CMM 504 (Cell Biology of Disease) | 3
CMM 577 (Principles of Cell Biology) | 4
CMM 595H (Problems in the Biology of Complex Diseases) | 2
EPID 576A (Biostatistics in Public Health) | 2
EPID 651 (Bioethics, Regulations, and Repercussions on Research) | 2
PATH 515 (Mechanisms of Human Disease) | 4
CMM 605 (Medical Immunology and Infectious Disease) | 4

*these courses are recommended, but other coursework in the biomedical sciences and medicine may be appropriate and will be considered as well. The student will be required to receive approval from his or her advisor for their final selection of courses.

b. A student must maintain an overall grade-point average (GPA) of 3.0. In accord with the policies of the Graduate College, any student whose cumulative GPA falls below 3.0 will be on probation for the following semester. If the student’s cumulative GPA is still below 3.0 at the end of the probationary semester, he/she will be dismissed from the program.

3. Every applicant must submit scores for either the GRE or the MCAT to be considered for admission.

4. International applicants will be considered for admission. All applicants must meet the requirements of the Graduate College concerning proficiency in the English language.

5. Concurrent enrollment in a degree program is permitted, except for the Master’s in Cellular and Molecular Medicine degree program. Courses that are counted toward the requirements of the Certificate Program may be counted toward the requirements of the Master’s Degree program at the discretion of the degree program.

6. Up to 3 units of graduate credit may be transferred from other institutions, at the discretion of the student’s advisory committee.

7. Student Advising. Students will receive advisement throughout their time in the certificate program, including advice on courses for the certificate program, career choices, possible future use of the certificate, opportunities for advanced education or professional training, and employment possibilities. Each student will be assigned a member of the Oversight Committee as primary advisor when he or she accepts admission into the certificate program. The student’s advisory committee will consist of the primary advisor and two additional
faculty members who have expertise related to the student’s area(s) of interest. One of these additional faculty members must be a member of the Oversight Committee, but the other may be any University of Arizona faculty member. The additional committee members will be chosen jointly by the student and the primary advisor. The members of the student’s advisory committee should be chosen, and the committee should meet, as soon as possible after the student enters the certificate program.

8. Every student will be required to file a Program of Study form, as specified by the Graduate College. This form can be found in GradPath. Information on accessing the forms in GradPath can be found on page 5 of this handbook.

9. A student in the Biomedical Sciences Graduate Certificate Program may apply to the Master’s in Cellular and Molecular Medicine degree program (or any other graduate programs). This requires completion of a standard application. For the CMM M.S. Program, course credits that have been taken for the Certificate will be counted towards the Master’s. Decisions about transfer credit requests will be made on an individual basis by the Admissions Committees of the degree programs.
ACADEMIC INTEGRITY

The University of Arizona Student Code of Conduct and other policies apply to students in CMM programs, and can be found here.

Principle: (from the above website) Integrity is expected of every student in all academic work. The guiding principle of academic integrity is that a student’s submitted work must be the student’s own. This principle is furthered by the student Code of Conduct and disciplinary procedures established by ABOR Policies 5-308 - 5-403, all provisions of which apply to all University of Arizona students. This Code of Academic Integrity (hereinafter "the Code") is intended to fulfill the requirement imposed by ABOR Policy 5-403.A.4 and otherwise to supplement the student Code of Conduct as permitted by ABOR Policy 5-308.C.1.

The most common issues for graduate students involve giving credit for ideas in writing. When answering a question about a paper, students need to paraphrase the language in their own words. It is not appropriate to lift phrases or sentences directly from the paper. Cutting-and-pasting anything from a document or the internet without attribution is plagiarism (http://www.merriam-webster.com/dictionary/plagiarism & http://www.turnitin.com/assets/en_us/media/plagiarism_spectrum.php). The penalties can be very severe, so be sure that you understand the rules.

Information on the University’s policies and procedures concerning Academic Integrity violations can be found at:

- http://deanofstudents.arizona.edu/policies-and-codes/code-academic-integrity
- http://deanofstudents.arizona.edu/academic-integrity/students/academic-integrity

ADDITIONAL INFORMATION

Student Roles in Program Governance

Student input and feedback are invaluable to building and maintaining strong training programs. Multiple mechanisms are available for students to shape the direction of the M.S. and Certificate Programs.

First, students are contacted annually by the Chair of the Master’s Oversight Committee to keep in contact and to offer meetings, as the students request.

Second, students are encouraged at any time to meet with members of the Master’s Oversight Committee if they have concerns or ideas regarding the program.

Student Resources

The CMM Department is committed to assisting all students as they participate in its programs. The Programs are designed for flexibility and CMM strives to be as accommodating as possible with respect to personal situations and considerations. Links to information on

Revised 6/21/2018 9
academic, professional, and personal resources available to graduate students can be found here. This includes information on Academic Services, Policies, and Procedures, Funding, Professional Development Resources, Child Care Subsidies and Family-Friendly Information, and Health, Wellness and Safety information.

**Satisfactory Academic Progress and Student Appeals**

**Academic Progress.** Students are required to demonstrate satisfactory academic progress toward degree completion. Beyond maintaining a minimum 3.0 grade-point average, students are assessed for their progress in many ways. In addition to informal feedback from the student’s Advisor, course instructors, and advisory committee, students will be formally evaluated using assessment tools that are applied for specific activities during program courses. Note that these tools are under development and will soon be available on the Program website.

Failure to make satisfactory academic progress is grounds for dismissal by the Dean of the Graduate College. The Graduate College will apply the CMM M.S. criteria for satisfactory progress if the program requests a student disqualification. Should the student’s Advisor and/or the Master’s Oversight Committee determine that the student is not making satisfactory progress, the student will be notified in writing, with a copy also sent to the Graduate College. This written notification will include steps for remediation and a timetable in which to complete the steps; these will be determined by the Advisor in consultation with the Master’s Oversight Committee.

**Incomplete Policy.** If a grade of “incomplete” is assigned to a student in any course, it is the student’s responsibility, in conjunction with the Director for that course, to complete this Report of Incomplete Grade. Instructions can be found on the form and they include the development of a plan for timely completion of the requirements for the course. Failure to complete the requirements as stated on the form may constitute a failure to make satisfactory academic progress. In this event, the steps outlined above will be followed.

**Student Appeals.** Students may appeal or rebut program decisions regarding satisfactory progress. Students should respond to the notification of unsatisfactory progress in writing, through a letter to the Master’s Oversight Committee. This will be followed by a meeting with the Committee. The student may also appeal to the Graduate College to determine whether the program followed the established program policies. Graduate College policies for how to appeal program decisions can be found here, along with information on how to deal with other types of potential grievances by graduate students.