

IOWA

Molecular Medicine Graduate Program

Graduate Student Guidelines

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A subprogram of the Biomedical Science Graduate Program at The University of Iowa Roy J. and Lucille A. Carver College of Medicine

The University of Iowa

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I. Introduction

The Interdisciplinary Graduate Program in Molecular Medicine (MMED) is a subprogram of the Biomedical Science Program at The University of Iowa whose course of study leads to a Ph.D. degree in Molecular Medicine. The Program does not offer a Master's degree (M.S.).

A total of 96 faculty members participate in the Program and may direct the Ph.D. dissertation research of Molecular Medicine graduate students. The primary departmental affiliations of the faculty include the Departments of Anatomy and Cell Biology, Biochemistry, Biology, Chemistry, Dows Institute for Dental Research, Internal Medicine, Microbiology and Immunology, Molecular Physiology and Biophysics, Neurology, Obstetrics and Gynecology, Ophthalmology and Visual Sciences, Otolaryngology, Pathology, Pediatrics, Pharmacology, Psychiatry and Radiation Oncology and Surgery.

II. Program Administration

A. Contacts:

Program Website:

<https://medicine.uiowa.edu/molecularmedicine>

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B. When Are You Required to Contact the Program Office:

Students need to contact the Program Office (copy Maggie) at each of these milestones:

I. Educational Milestones:

- Anytime your name, address, home phone number, cell phone number, or office/lab contact information changes
- When you make rotation mentor choices
- When you begin and complete TAs
- When you choose your mentor
- Anytime your funding source changes
- When you choose your committees
- When you have changes in your committee membership
- When you need Maggie to schedule committee meetings
- If you prefer to schedule your committee meetings independently, immediately upon scheduling the meetings
- As soon as you know you plan to defend in a particular semester
- As soon as you know your defense date
- Alumni—whenever you have a change of position, institution, name, or other contact information

II. Noteworthy Accomplishments:

For website updates and to assist the Program Administration with other Molecular Medicine Program public relations, promotional, and training grant goals, please contact the Program Office when:

a. Students

- You receive fellowships, grants, or other monetary awards
- You publish papers or chapters
- You receive any honors or awards
- You receive any positive media attention
- Anything else you think may be announcement worthy

b. Faculty

- You receive moderate or high level accolades of any sort
- You receive any positive media attention
- You receive any award related to your teaching
- You publish something particularly noteworthy
- You receive noteworthy grants or other monetary awards

c. Whom Should You Contact:

Although Maggie and Britt are both happy to assist you or guide you in the right direction, the table below lists the task distribution for some common Program Office requests.

First Contact	Question or Request
Maggie	Registration changes (adds, drops, and change of hours forms)
Britt	Website updates and corrections
Britt	Research rotations and rotation evaluations
Britt	Room reservations
Britt	Travel arrangements and reimbursements
Britt	Meeting arrangements
Britt	Invoice payments (e.g. restaurant or supply bills)
Britt	Reports for Committee meetings
Britt	Reports for Comprehensive Committee meetings
Britt	Poster printing
Maggie	Course evaluations
Maggie	Budget questions
Maggie	Policy questions
Maggie	Stipend questions
Maggie	U-Bill questions
Maggie	Grant and fellowship questions
Maggie	Complaints/concerns/problems
Maggie or Britt	At educational milestones listed above

III. **Financial Support (stipend, tuition, covered fees):**

Graduate students in the Molecular Medicine Program at the University of Iowa are normally fully supported (stipend, tuition, covered fees) throughout their training in the Program, contingent on satisfactory progress, for a period that normally runs 4 to 6 years (total expected training time). Whether the student is making satisfactory progress is determined by the student's mentor, the Student Advisory Committee, and the Program Director.

Graduate student appointments include a stipend, which is subject to change each year commensurate with the recommendation of the Office of the Associate Dean for Graduate and Postdoctoral Studies of the College of Medicine. The stipend is set to be competitive with peer institutions. Stipends for students appointed to federal training grants (T32s, F31s, see below) are typically capped at levels below the University of Iowa biomedical stipend level, and in such cases, the difference is made up by the Program, mentor, or from other funds.

Tuition and covered fees¹ include the following: (1) Base tuition and associated mandatory fees (technology fee, student activities fee, student services fee, student union fee, building fee, recreation facility fee, arts & cultural events fee, professional enhancement fee for graduate students, student health service fee); (2) All fees associated with registration changes, credit hour changes, and other changes that occur in connection with required and directly relevant courses. Fees that are NOT covered by the Program include: (1) Key deposits; (2) Fees associated with extracurricular or other elective courses not relevant to the program of study; (3) Fines, penalties, parking tickets, and other such violation-associated fees; (4) Mandatory fees associated with submitting a dissertation, including a degree application fee, a publication and binding fee, and a thesis fee; (5) Fees and regalia rental charges associated with participating in commencement.

Stipend, tuition, and covered fees are paid by either University and/or departmental funds, and/or by extramural sources. Graduate students receive support through the following mechanisms:

A. Training Grants:

Students in the early years of training may be appointed to federal traineeships, including the Pharmacological Sciences Training Grant (T32) and the Interdisciplinary Training Program in Pain Research. Such appointments are based on merit, and thus are considered honorific. Applications to training grants normally require submission of specific materials by certain deadlines, and interested students are encouraged to consult with their mentor and T32 Program Directors.

B. Teaching Assistantships:

Students in the second and subsequent years of training may be appointed to a graduate teaching assistantship from funds provided by the Graduate College. Such

¹ As of August, 2016, the University instituted a new policy whereby first-time matriculating students (students enrolling at Iowa for the first time) will be assessed a mandatory one-time University Records and Documents Fee (see [University Records and Documents Fee](#)). This \$225 fee will be covered by the Molecular Medicine Program for eligible students, beginning August 2016 and thereafter.

appointments may take place directly through the Molecular Medicine Program, or indirectly through an affiliated Department (i.e., Biology).

C. Other Means of Support:

Students may receive support from other sources, including University of Iowa Graduate College Fellowships and a variety of nationally competitive NIH, NSF, and other individual awards.

Note: ALL Molecular Medicine students are required to submit an individual pre-doctoral fellowship application before graduation. In most cases, this can be accomplished through the modification of student's comprehensive exam (see comprehensive exam section).

D. Summer Registration:

Graduate students in the Program normally do not register for summer term. There are four exceptions to this: (1) Some first-year students who may take courses during their first summer; (2) Students taking the Comprehensive Examination during the summer term; (3) Students who are defending their PhD during the summer term; and (4) Students who have a summer fellowship (e.g., from the Graduate College). Outside of these exceptions, students will not register for the summer. (This policy is broadly in effect for all of the biomedical science advanced degree programs at the University of Iowa.)

E. Tax Information:

Students should be aware that IRS regulations may require FICA withholding for summer stipend checks for students not registered for the summer term. This can amount to an income loss of about \$300, depending on the student's particular circumstances.

For students who are on a training grant fellowship (e.g., T32), it is recommended that the W-4 is changed to withhold taxes from paychecks each month for both federal and state. This will eliminate paying estimated taxes quarterly, and/or associated penalties. Consultation with the Benefits Office is recommended regarding tax matters.

IV. **Academic Standards:**

To be eligible for continuation of stipend support and tuition scholarships, graduate students must satisfy the following minimum conditions of satisfactory performance.

A. Registration:

The student must pursue continuous, full time studies (15 semester hours per semester prior to passing the Comprehensive Examination, then 1-2 sh registration after completion of the Comprehensive Examination). The Graduate College has a specific definition of "continuous, full time studies," with which Molecular Medicine students must be in compliance, and students are encouraged to consult with the Graduate College for further information.

B. Coursework:

The student must complete coursework in a timely manner. Core and elective courses for the Molecular Medicine Program are normally completed by the end of the second year (or by the end of the first year for MSTP students; see section III.J below).

I. English Proficiency:

For students whose first language is not English, the Graduate College specifies that a matriculating graduate student who's TOEFL score is below the required level must take the English Proficiency Examination (EPE).

The EPE is usually taken prior to the student's initial registration for courses. The student is required to enroll in and complete English as Second Language (ESL) course(s) as prescribed by the results of the EPE. All ESL course(s) should be completed within the first year.

C. Academic Standing:

I. Program Requirements:

The student must maintain a cumulative grade point average (GPA) of 3.0 in coursework. No research or independent study taken during a student's graduate training counts in the GPA for this purpose.

Any student receiving two or more U (unsatisfactory) grades in either the seminar (MMED:7290 Seminar in Molecular Medicine), research (MMED:7305 Molecular Medicine Research) or the BMED:7270/7271 Scholarly Integrity/Responsible Conduct of Research 1 or 2 courses will be subject to a progress evaluation by the Graduate Studies Committee.

The Program Head, acting on the recommendation of the Graduate Studies Committee, may rule that the student be dismissed from the Molecular Medicine Program.

Student progress is evaluated by grading of coursework, including the laboratory research course, as well as by the described mechanisms for evaluation of the Dissertation Plan presentation and Comprehensive Examination. Continuance in the

Molecular Medicine Graduate Program is dependent upon the student making satisfactory progress towards a Ph.D. degree.

II. Graduate College Policy:

The student shall be placed on academic probation by the Graduate College if, after completing 9 hours of graded (A, B, C, D, F) graduate work at The University of Iowa, the student's cumulative grade-point average falls below 3.00.

A student will be returned to good standing when his or her cumulative grade-point average becomes equal to or greater than 3.00. If, after completing 9 more semester hours of graded (A, B, C, D, F) graduate work at this University, the student's cumulative grade-point average remains below 3.00, the student shall be dropped from the degree program and denied permission to reregister within any Graduate College doctoral degree program. The student may apply for and be accepted into a nondoctoral degree or certificate program.

a. Laboratory and Seminar:

The student must maintain satisfactory laboratory and seminar performances as evidenced by grades of "S" in MMED:7305, Molecular Medicine Research, and MMED:7290, Molecular Medicine Seminar.

V. Supervision of Graduate Students:

A. Program Director:

The Director of the Program provides overall supervision of the graduate studies, including helping students to select (a) their research rotations in the first year and (b) their Ph.D. dissertation research advisor at the beginning of the second year. Students are encouraged to freely consult with the Program Director.

B. Director of Graduate Studies (DGS):

The DGS serves as Chair of the Graduate Studies Committee. The DGS works closely with the Director of the Program to monitor student academic progress as well as providing advice to students regarding rotations, curriculum and program policies.

The DGS also serves as the Program Liaison with the Graduate College by attending the Graduate College DGS meetings as the Molecular Medicine representative and reporting important information back to the program faculty and students. Students are encouraged to freely consult with the DGS.

C. Graduate Studies Committee:

This committee oversees the program of courses and directs the course of study for 1st and 2nd year students. The Committee evaluates undergraduate transcripts to ensure that prerequisites have been fulfilled and recommends remedial courses as needed. It reviews and evaluates new and current courses and approves new courses as electives as needed.

The Committee reviews the progress of each student during the pre-comps phase of study and meets each semester with students individually to discuss this matter. In

general, the Committee advises students on course requirements and research activities during their first two years. Students are encouraged to freely consult with the members of this Committee.

D. Ph.D. Dissertation Advisor:

After laboratory rotations are completed, the student is expected to have identified a member of the Molecular Medicine faculty with whom to conduct his/her PhD research and to serve as the student's Ph.D. dissertation advisor. The advisor is selected by mutual consent of the student and the faculty member after consultation with the Program Director and the Graduate Studies Committee.

E. Program Office:

The Molecular Medicine Ph.D. Program shares office space with the other interdisciplinary graduate programs. This office is located in room 357 Medical Research Center. It provides administrative and secretarial support for the Program Director, the Program committees, and the Program course instructors.

It also has information about the Molecular Medicine Ph.D. Program, materials for applying to the Program, and forms for completing coursework registration, for taking the comprehensive and final examinations, and other documentation associated with your status as a graduate student. It is a great place to start if you have any questions about the official or institutional aspects of being a graduate student at The University of Iowa.

VI. **Program Committees:**

Program Committees provide guidance and execution of the policies and procedures of the Program in all major areas that comprise a PhD training program. The Committees operate autonomously from the Program Director, with the Chair of each Committee serving as a liaison between the Committee and the Program Director.

Committee membership is guided by several principles:

1. There is multi-departmental representation, from both basic science and clinical departments;
2. Faculty members are qualified to serve and are interested in participating;
3. Committee membership is rotated (on a 3-year cycle) so that there is always a mixture of more experienced and less experienced members, ensuring continuity of committee purpose and function;
4. There is student representation on all appropriate committees (students have 1- or 2-year cycles). Faculty and students are invited (or volunteer) to participate on committees by the Program Director.

A. Executive Committee:

The **Executive Committee** sets overarching agenda and policy for the Program. The Executive Committee meets approximately once per semester, and more often as necessary, to review and discuss issues of general program importance.

B. Admissions Committee:

The **Admissions Committee** is responsible for all activities related to recruitment and admissions. A major function is the annual review of applicants, including selection of applicants for on-campus interviews, admission recommendations, and recommendations for nominations for special fellowships. Another vital function is participation in recruitment efforts, such as attending fairs and promotional activities at colleges and universities throughout the nation in order to promote our Program to undergraduates.

The Committee meets frequently during the admissions “season” (about once every two weeks during the December-through-March period), and on a couple of other occasions throughout the year.

C. Graduate Studies Committee:

The **Graduate Studies Committee** is responsible for advising students, for monitoring student progress in the Program, and for timely identification of students who are not making reasonable progress. The mission of the committee is to enhance the graduate student experience and facilitate successful and timely completion of the PhD degree in Molecular Medicine. The committee monitors principal facets of student progress, including coursework, laboratory rotations, thesis and research progress, and career development. In the post-comprehensive examination phase, the committee facilitates student productivity by focusing on progress in publications, grant applications, and postdoctoral training opportunities.

The Graduate Studies Committee is comprised by approximately 5 faculty members who represent the diverse topics and expertise of the Program (covering the range from cellular/molecular to behavioral/systems biology), together with the Program Coordinator. In cases in which students are not making satisfactory progress, and/or in which major problems are evident, the committee will bring the situation to the attention of the Program Director, and make recommendations for intervention.

VII. **Curriculum:**

The curriculum is a sequence of required and elective courses, which provides students with a broad exposure to areas including molecular biology, cell biology, biochemistry, and integrative sciences. It ensures a comprehensive exposure to conceptual and experimental aspects of molecular & cellular biology.

The first year of study involves courses required by the Biomedical Sciences Program (BSP) of which Molecular Medicine functions as a subprogram of study.

In the second year of study in the Molecular Medicine Graduate Program, students select from 1 of 3 research tracks for more specialized coursework. These tracks are 1) Metabolic Disorders, 2) Cardiovascular Biology, and 3) Molecular and Cellular Medicine.

Importantly, sufficient flexibility is provided so that students can adapt the program to permit specialization in their own area of interest, which is important due to the great diversity of

biological research problems that can be pursued using molecular biological approaches. It is expected that entering students will have a solid background in chemistry and mathematics, as well as the biological sciences. Prospective students should have taken undergraduate courses in introductory biology and chemistry, biochemistry, genetics, organic chemistry, physical chemistry, and calculus. Course work in molecular and cell biology is desirable. Deficiencies in a particular area, as determined by the Graduate Studies Committee, can be remediated by completion of appropriate courses during the first year of graduate study.

A. Required Courses:

All Molecular Medicine students are encouraged to take the following courses:

I. First Year Bsp Core Curriculum:

a. Fall

- BMED:5207 Principles Molecular & Cellular Biology (3 sh)
- PCOL:5204 Basic Biostatistics and Experimental Design (1 sh)
- MMED:8115 Molecular Physiology (4 sh) (MMED Recommended Course)
- MMED:6280 Critical Thinking in Molecular Medicine (1 sh) (MMED Recommended Course)

b. Spring

- MMED:5270 Pathogenesis of Major Human Diseases (3 sh)
- MMED:6260 Methods for Molecular and Translational Medicine (1 sh)
- MMED:6280 Critical Thinking in Molecular Medicine (1 sh) (MMED Recommended Course)
- Elective(s)

II. Second Year – Track/Theme-Specific Coursework:

a. Major Tracks

1. *Metabolic Disorders*
2. *Cardiovascular Biology*
3. *Molecular and Cellular Medicine*

1. Metabolic Disorders

- BIOC:7253 Metabolism I (1 sh – fall)
- BIOC:7255 Metabolism II (1 sh - spring)
- MMED:6230 Pathogenesis of Metabolic/Cardiovascular Disorders (3 sh - fall)
 - Anatomy
 - Physiology
 - Pathophysiology
 - Pharmacology
- MMED:6280 Critical Thinking in Molecular Medicine (1 sh – fall and spring)
- MMED:7310 Translational Medicine Education Rounds (1 sh – fall and spring)
- Elective (1 sh total)

2. Cardiovascular Biology

- MMED:6230 Pathogenesis of Metabolic/Cardiovascular Disorders (3 sh - fall)
 - Anatomy
 - Physiology
 - Pathophysiology
 - Pharmacology
- MMED:6280 Critical Thinking in Molecular Medicine (1 sh – fall and spring)
- MMED:7310 Translational Medicine Education Rounds (1 sh – fall and spring)
- Elective(s) (3 sh total)

3. Molecular and Cellular Medicine (General)

- MMED:6220 Mechanisms of Cellular Organization (3 sh - fall)
- MMED:6280 Critical Thinking in Molecular Medicine (1 sh – fall and spring)
- MMED:7310 Translational Medicine Education Rounds (1 sh – fall and spring)
- 3 sh of courses from the following list:
 - MMED:3310 Data Science and Bioinformatics (3 sh - spring)
 - MMED:6225 Growth Factor Receptor Signaling (1 sh - spring)
 - MMED:6226 Cell Cycle Control (1 sh - spring)
 - MMED:6227 Cell Fate Decisions (1 sh - spring)
 - Elective (1 sh maximum)

Molecular Medicine students also take the following seminar and professional development classes. These courses are in addition to the 18 sh of didactic course work included in the above requirements.

- MMED:6280 Critical Thinking in Molecular Medicine (1 sh) (*pre-comps* students should register each semester)
- BMED:7270 Scholarly Integrity/Responsible Conduct of Research 1 (0 sh)
- BMED:7271 Scholarly Integrity/Responsible Conduct of Research 2 (0 sh)
- MMED:7290 Seminar in Molecular Medicine (1 sh) (*all* students register each semester)

Molecular Medicine Program students should be aware of the stipulations and consequences of the University of Iowa Graduate College policy regarding academic probation, which applies when a student's cumulative GPA falls below 3.0: <http://www.grad.uiowa.edu/manual-part-1-section-iv-academic-standing-probation-and-dismissal>.

B. Elective Courses:

The following courses are currently approved as electives in Molecular Medicine. Other courses may be taken for credit as elective courses upon approval of the Graduate Studies Committee or the Director of the Program. The Graduate Studies Committee reviews new offerings and remains open to new ideas for courses.

APPROVED ELECTIVE COURSES AVAILABLE

Course No.	Title	Sem. Hrs.	Semester
Fall			
ACB:5218	Microscopy for Biomedical Research	3 sh	F & S
BIOC:5243	Biophysical Chemistry Module 1: Protein Structure, Function & Regulation	1 sh	F
BIOC:5245	Biophysical Chemistry Module 2: Protein Structure, Stability & Folding	1 sh	F
BIOC:5247	Biophysical Chemistry Module 3: Biophysics of Macromolecular Interaction	1 sh	F
BIOC:7251	Introduction to Protein Structures	1 sh	F
BIOC:7252	Enzymes, Carbohydrates, Nucleic Acids, and Bioenergetics	1 sh	F
BIOC:7253	Metabolism I	1 sh	F
BIOL:3172	Evolution	4 sh	F & S
BIOL:4213	Bioinformatics	4 sh	F
BIOL:5412	Fundamental Genetics – Graduate Lecture	3 sh	F
BIOL:5512	Fundamental Genetics – Graduate Disc.	1 sh	F
BIOS:4120	Introduction to Biostatistics	3 sh	F, S & Su
BME:5320	Bioinformatics Techniques	3 sh	F
CS:5110	Introduction to Informatics	3 sh	F
FRRB:5000	Radiation Biology	4 sh	F (odd years)
FRRB:7000	Redox Biology and Medicine	4 sh	F (even years)
FRRB:7001	Molecular & Cellular Biology of Cancer	3 sh	F
GENE:6150	Genetic Analysis of Biological Systems	3 sh	F
IMMU:6241	Writing a Scientific Proposal	1 sh	F (special permission needed from Instructor)
IMMU:7221	Advanced Topics in Immunology	3 sh	F
MMED:6220	Mechanisms of Cellular Organization	3 sh	F
MICR:6247	Graduate Immunology and Human Disease	4 sh	F
MICR:6267	Graduate Viruses and Human Disease	4 sh	F
MICR:6270	Graduate Microbial Genetics	3 sh	F

Course No.	Title	Sem. Hrs.	Semester
MICR:7217	Integrated Topics in Infectious Diseases	1 sh	F & S
MPB:5153	Graduate Physiology	4 sh	F
NSCI:5653	Fundamental Neurobiology	4 sh	F
NSCI:7235	Neurobiology of Disease	3 sh	F
PATH:5260	Translational Histopathology	3 sh	F
PTRS:6224	Activity Based Plasticity in Healthcare	4 sh	F
PTRS:7885	Biomechanical Analysis in Rehabilitation	3 sh	F (odd yrs)

Course No.	Title	Sem. Hrs.	Semester
Winter			
MED:5205	Practical Bioinformatics	1 sh	Winter
Course No.	Title	Sem. Hrs.	Semester
Spring			
ACB:8120	Gross Anatomy w/lab	6 sh	S
BIOL:3172	Evolution	4 sh	F & S
BIOL:4333	Genes and Development	3 sh	S
BIOC:5244	Enzyme Mechanisms and Ligand Interaction	1 sh	S
BIOC:5246	Structure Determination Techniques	1 sh	S
BIOC:5248	Molecular Dynamics & Macromolecule Structure	1 sh	S
BIOC:7254	Cellular Biochemistry	1 sh	S
BIOC:7255	Metabolism II	1 sh	S
BIOC:7256	Molecular Biology	1 sh	S
BIOS:4120	Introduction to Biostatistics	3 sh	F, S, SU
BME:5330	Computational Genomics	3 sh	S
EPID:6250	Genetics & Epidemiology	3 sh	S
GENE:6234	Basic Biostatistical Methods in Genetics Apps	1 sh	S
GENE:7191	Human Molecular Genetics	3 sh	S (even yrs)
IMMU:6201	Graduate Immunology	3 sh	S
MMED:3310	Data Science and Bioinformatics	3 sh	S
MMED:5270	Pathogenesis of Major Human Diseases	3 sh	S
MMED:6225	Growth Factor Receptor Signaling	1 sh	S
MMED:6226	Cell Cycle Control	1 sh	S
MMED:6227	Cell Fate Decisions	1 sh	S
MICR:6259	Graduate Pathogenic Bacteriology	3 sh	S
MICR:6268	Biology and Pathogenesis of Viruses	2 sh	S

Course No.	Title	Sem. Hrs.	Semester
MICR:6279	Graduate Bacterial Diversity	3 sh	S
MICR:7217	Integrated Topics in Infectious Diseases	1 sh	F & S
MICR:7269	Grad Topics in Viral Biology/Pathogenesis	1 sh	S
NSCI:5753	Developmental Neuroscience	1 sh	S
PCOL:5135	Principles of Pharmacology	1 sh	S
PCOL:5136	Pharmacogenetics & Pharmacogenomics	1 sh	S
PCOL:5137	Neurotransmitters	1 sh	S
PCOL:6207	Ion Channel Pharmacology	1 sh	S
PCOL:6208	G Proteins & G Protein-Coupled Receptors	1 sh	S
PCOL:6209	Steroid Receptor Signaling	1 sh	S
PHAR:5521	High Throughput Screening for Biomed Sci	1 sh	S
PHAR:5537	Enzymatic Basis of Drug Metabolism	3 sh	S (even yrs)

VIII. Ethics and Responsible Conduct of Research

A. Courses:

Courses entitled *Scholarly Integrity/Responsible Conduct of Research 1 and 2* are required for all graduate students in Molecular Medicine. These courses are designed to expand on and advance training in the principles of scholarly integrity and responsible conduct of research (SI/RCR). As a prerequisite, all individuals taking these courses will have completed basic SI/RCR training through completion of CITI online, web-based training.

Following verification of successful completion of all required CITI modules, graduate students **must** complete the 2-semester sequence (BMED:7270, BMED:7271) for meeting full SI/RCR training requirements per the CCOM Office of Graduate & Postdoctoral Studies and their respective departments and programs. Individuals may start the series in either the Fall or Spring semester and complete the series in the following semester (e.g., Fall > Spring; or Spring > Fall series). The workshops emphasize small group discussions and foster ongoing conversations that explore important aspects of the ethical and responsible conduct of scholarly research. Case studies are assigned that cover all core competency areas emphasized by NIH – data acquisition, management, sharing & ownership; conflict of interest & commitment; human subjects; animal welfare; research misconduct; publication practices & responsible authorship; mentor/trainee responsibilities; peer review; collaborative science; financial management; research safety; responsibility to society.

B. Academic Misconduct:

Any form of cheating or plagiarism with respect to curricula, coursework, or examinations is grounds for dismissal from the Program. The policy and procedures regarding academic

misconduct are defined in the University of Iowa *Graduate College Manual of Rules and Regulations* (<http://www.grad.uiowa.edu/manual-part-1-section-iv-academic-standing-probation-and-dismissal>).

All written work, including academic assignments, papers, exams and proposals, submitted by Program students will be routinely screened for the occurrence of plagiarism. Plagiarism is defined as the act of taking another's ideas, words, or creative works and presenting them as your own, or presenting them without proper attribution. If you have any uncertainty about what constitutes plagiarism, you are urged to contact the Director of Graduate Studies.

C. Scientific Misconduct:

The U.S. Public Health Service has a formal policy dealing with misconduct. It is described in a special July 19, 1985, issue of the NIH Guide to Grants and Contracts. At the very least we must respect this statement. It says in part: It is the policy of the PHS to maintain high ethical standards in research and to investigate and resolve promptly and fairly all instances of alleged or apparent misconduct. As defined by the policy, "misconduct" is: (1) Serious deviation from accepted practices in carrying out research or in reporting the results of research. This includes fabrication, falsification, or plagiarism of data. (2) Other examples include material failure to comply with Federal requirements affecting specific aspects of the conduct of research; e.g. the protection of human subjects and the welfare of laboratory animals. Misconduct does not include errors of judgment, errors in the recording, selection, or analysis of data or differences in opinions involved in the interpretation of data. Scientific misconduct is grounds for immediate dismissal from the Molecular Medicine Ph.D. Program.

D. Sexual Harassment:

The University of Iowa has specific guidelines and regulations on sexual harassment. These guidelines are available from the University and should be reviewed by all members of the Molecular Medicine Program. They are also posted on the University web site: <http://www.uiowa.edu/~our/opmanual/ii/04.htm>

E. Counseling Resources:

We need to be constantly vigilant about not only the scientific health and status of our students and faculty, but also about their mental health. Graduate school can be extremely stressful for students and faculty alike.

We would like to remind our students and faculty that if concerns arise about their mental health status, for whatever reason, it is appropriate to seek help. The University offers counseling services for students at University Counseling Service (3223 Westlawn, 335-7294) and for faculty at Faculty Services (5101A D, 335-2085). Individual faculty or students should feel free to contact those services directly or, if they feel it appropriate, to talk with the Program Director about the possible need for interventions.

IX. **Research and Laboratory Rotations:**

Students are encouraged to obtain a maximum of laboratory research experience during the first two years of their graduate studies. To ensure that students will obtain early involvement in laboratory research, students are required to register for research credits and do three laboratory rotations during the first year of graduate school. In general, these rotations will be done in laboratories of three different Molecular Medicine faculty members. However, in some cases, if approved by the Program, a student may be allowed to do two of their rotations in the same laboratory.

Incoming students are encouraged to identify potential labs for their rotations before arriving in Iowa.

**** A final decision for your dissertation laboratory is due by May 15 of year one.**

During the first semester, each student identifies specific Program faculty members in whose laboratories they will conduct these research rotations after he/she has (a) discussed possible projects with several Program faculty members and (b) consulted with the Graduate Studies Committee and the Director of the Program. Research rotations in laboratories of non-Molecular Medicine Program faculty members can be done under special circumstances, if approved beforehand by the Graduate Studies Committee. It is often better to delay finalizing second and third laboratory rotation commitments, in order to remain flexible and allow your choices to be guided by your experiences in classes and labs.

At the end of the first and second semester, each student gives a short 10-minute oral presentation describing one of his/her rotation research projects at the weekly Molecular Medicine workshop series. Student progress in each rotation is also evaluated by the faculty member supervising that rotation. The student must make satisfactory progress during laboratory rotations as indicated on the rotation evaluation form submitted by the rotation mentor and submitted S/U grades for MMED:7305 Molecular Medicine Research (see **Academic Standards**).

By the close of the second semester, students select a single laboratory for their PhD research. Upon successful completion of the Comprehensive Examination, taken at the end of the second year (see below), students are expected to devote the major portion of their effort toward their dissertation research.

A. Research and Laboratory Rotations:

During the first year in the Biomedical Sciences Program, the graduate students perform three different research laboratory rotations. Rotations serve as the primary mechanism to identify a faculty mentor for a thesis project and PhD program.

I. Rotations are designed to:

1. Facilitate the transition from undergraduate to graduate education.
2. Expose students to the breadth of research in the program.
3. Experience a wide range of experimental methods and techniques
4. Help students identify mentors, lab environments and research projects that are a good fit for them.

5. Help faculty identify students who are a good fit for their lab.

II. Timetable for the 2023 – 2024 rotations deadlines and schedule.

a. Deadlines for Rotation Submission approval:

Fall Rotation: August 18, 2023

Winter Rotation: November 6, 2023

Spring Rotation: February 5, 2024

b. Rotation Schedule

Fall Rotation: August 21 – November 10, 2023

Winter Rotation: November 13, 2023 – February 9, 2024

Spring Rotation: February 12, 2024 – May 3, 2024

Students submit their choice of thesis laboratory and subprogram on May 12 after completion of all rotations. Students will receive matriculation response from PI and subprogram by May 19.

B. Selection of a Rotation Laboratory:

Prior to selecting a laboratory for dissertation work and PhD program, students are expected to perform three laboratory rotations, with each rotation being approximately 10-12 weeks in duration. Students are encouraged to meet with specific faculty to discuss their research programs. Students can then make an informed decision about their laboratory rotations, with the guidance of their first-year faculty advisor and approval of the BSP.

Research rotations must be performed in laboratories in which the principal investigator (PI) holds a faculty appointment and graduate student training privileges in a participating subprogram of the BSP. Students can familiarize themselves with the research of various faculty by consulting the BSP and subprogram websites:

- Cancer Biology
- Cell and Developmental Biology
- Free Radical and Radiation Biology
- Molecular Medicine
- Molecular Physiology and Biophysics
- Pharmacology

When meeting with a professor to discuss the possibility of doing a rotation, students should ask about potential projects and whether that faculty member expects to take a new graduate student. Conversely, students should expect faculty to ask about the student's interests and research experience. Be prepared to make the most of these important conversations. Because the overarching goal of rotations is to match each student with a faculty mentor for a thesis project, students should (with rare exceptions) only rotate through laboratories that are likely to accept new graduate students. Students need to ask this important question during their discussion with potential rotation mentors.

Placement of students into laboratories for pursuit of a Ph.D. degree involves a matching process that takes several factors into account. First and foremost is the interest of the student. But faculty interests and resources are important too. The willingness of a faculty member to serve as the student's mentor will depend in part on the student's performance during their rotations. It is essential that students make every effort to demonstrate curiosity, drive, and aptitude during their rotations, especially in the case of laboratories that might have multiple rotators but resources to support only one new student at the end of the year. Other important considerations include the student's performance in didactic courses and whether the mentor has funds, bench space and time to support and mentor a new student trainee.

With permission of the BSP Director, students may rotate in the same lab twice. The Director will consider whether any other students are hoping to rotate in or join that lab. Second rotations in the same lab will generally only be allowed in the Spring rotation period.

C. Rotation Evaluation:

Upon the completion of each rotation, an evaluation by the faculty member of the student and by the student of the faculty member will be submitted to Biomedical Science Program. The program's director and curriculum director review the evaluation and evaluations are recorded in the student's file. The student's performance on rotations will be noted and a letter will be filed and sent to the student in cases where major problems (deficiencies) are indicated. This information is available only to the faculty and, of course, the student.

The rotations are graded as either "Satisfactory" or "Unsatisfactory". The grade is based upon several criteria including attendance and work habits in the lab. When not in classes or seminars, students are expected to spend the remaining portion of the day in the laboratory. A strong commitment to the rotation project makes it possible to fulfill the purpose and aims of the rotation. A "Satisfactory" grade is required in each of the laboratory rotations. If a "Satisfactory" grade is not obtained in one of the rotations, an additional rotation may be assigned. Failure to obtain a "Satisfactory" grade in the extra rotation will result in the student being placed on academic probation.

D. Matriculation into a Lab for Dissertation Research:

Near the end of the Spring Rotation, students should begin to solidify their preference for dissertation advisor and PhD subprogram. Students should discuss possible projects with faculty members they rotated with and consider as many dimensions as possible including the definition of the dissertation project, prospects for the research, and the scientific approach.

After approval to join a faculty member's laboratory for thesis research has been secured by the student, the student must submit a written request for approval to the BSP. The written request needs to include the name of the dissertation advisor and PhD subprogram the student is requesting to join. A final decision is made by the BSP director, curriculum director and the director of graduate studies of the respective subprogram and communicated in writing to the student.

X. **Selection of Clinical Mentor:**

After selection of the research lab by the close of the second semester, students will consult with their research mentor on selecting a suitable clinical mentor for the Translational Medicine Education Rounds course required during the second year of the program. Students in the Molecular Medicine Graduate Program obtain clinical insights into their area of specialty in biomedical research through selection of a clinical mentor to complement the expertise of their research mentor. The clinical mentor should be an expert in the clinical aspects of the student's future research project, and the clinical mentor will meet with students 1 hour/week to provide case studies, clinical scenarios, and physician shadowing opportunities which may allow students to gain new perspectives and insight into applications of biomedical research. The selection of the Clinical Mentor must be approved by the Program Director.

XI. **Teaching Requirement:**

An important aspect of your doctoral training includes gaining experience and proficiency in teaching and effectively communicating information to others. In order to meet this goal, all students in the program must satisfy the requirement by teaching a course with a minimum of 1 sh. This teaching requirement must be met prior to your final dissertation defense and graduation. It is recommended that it occur in year 3 following completion of the comprehensive examination.

The Molecular Medicine office will maintain a list of teaching possibilities:

Students are encouraged to discuss their course preferences with their mentors, the Graduate Studies Committee, and the Program Director. You may request to complete your teaching requirement outside the primary list by submitting a letter to the Graduate Studies Committee. A detailed course description, summary of teaching duties, and rationale for the request should be included with this letter. All students shall submit a list of their preferred courses (including time for completion) to the Graduate Studies Committee prior to completion of their 2nd year of training in the program.

Teaching assignments will be made by the Program Director in consultation with the Director of Graduate Studies and/or the Course Directors. The Course Director(s) shall provide the student with clear guidelines summarizing the expectations and duties for completing the assignment. The student shall receive guidance during the semester and constructive feedback at the end of the semester to assess his/her performance. The Course Director shall provide a written evaluation of the student's performance, and a satisfactory report is required for completion of this program requirement. Along with the course instructors, the student shall also receive feedback from students in the course as part of the overall course surveys that are conducted.

XII. **Dissertation Committee:**

Dissertation Committee Membership:

Before beginning the fourth semester (Year 2, Spring semester) of graduate training in the Program, the student shall identify his/her Dissertation Committee. The function of the Dissertation Committee is to advise and counsel the student during the research phase of

training. The five Dissertation Committee members will be chosen by the student in close consultation with the Dissertation Advisor. The Dissertation Advisor and at least three faculty members of the Dissertation Committee shall be active members of the Molecular Medicine PhD Program. At least two different University Departments must be represented among these four Molecular Medicine Program faculty. The fifth member of the Dissertation Committee may either be a member of the Molecular Medicine program or a graduate faculty member from outside the Program. When the Dissertation Advisor is a new trainer (has not graduated a student with a PhD), at least one member of the committee must be an experienced trainer (having previously graduated a student with a PhD) and willing to act as faculty mentor to the new trainer. The Committee must be approved by the Director of Graduate Studies and the Program Director.

[Note: At this same time, the student and mentor should identify another active Molecular Medicine faculty member, who shall serve as the Chair of the Comprehensive Examination Committee – see details below.]

XIII. **PhD Dissertation Plan:**

Dissertation Plan shall be written, submitted to the Program Office, and the Comprehensive Examination Chair by March 1 (Year 2, Spring semester). The Plan shall describe the dissertation research project, including any pilot studies that have been carried out as part of the student's research experience. The Plan is the foundation for the student's Ph.D. dissertation research project and comprehensive exam should the student choose an "on-topic" comprehensive exam (see comprehensive exam section).

*It is expected that this Plan shall arise from extensive discussions that have occurred while the student has been working in the laboratory of the Dissertation Advisor; however, the Plan itself must be prepared and written independently by the student. In addition, the Specific Aims of the comprehensive exam should **NOT** be included in this document.* Students may consult with other students, post-docs, and faculty who are not members of his/her Dissertation or Comprehensive Examination Committees.

A suggested format for each Plan is as follows:

A. Cover sheet:

Give the plan's title, student's name, and submission date. Provide a committee signature area (Molecular Medicine Program Office will provide this form).

B. Summary of Dissertation Project (1 page):

Summary of the intended research. Include the overall hypothesis for the research and how the work might impact the field. The Dissertation summary should not include the specific aims of an "on-topic" comprehensive exam (see also instructions for Specific Aims under Comprehensive Examination below).

C. Individual Development Plan (3 pages):

Individual Development Plans (IDPs) are tools used by graduate and postgraduate students to formulate career goals and promote progress towards their achievement. (Please see Individual Development Plan section below).

D. Reference List:

Provide a list of key references used to write the dissertation plan, including all authors, titles of papers, and full journal citations.

E. Appendix:

Attach electronic versions of 2-3 key papers for the Dissertation Committee.

The Summary of Dissertation Project should be 1 single-spaced page with 1 inch margins and a 11 point font size. This page limit encompasses only part A above (excluding References). The best research plans are simply and clearly written and have been revised by the student several times to achieve the most concise presentation.

The Dissertation Plan must be submitted to the Molecular Medicine Program Office for distribution to the Dissertation Committee and Comprehensive Examination Committee Chair at least one week prior to the oral presentation. A cover sheet for the Plan will be provided by the program office on which the title of the Plan, the student's name, and submission date will be entered. The Dissertation Advisor and Dissertation Committee must sign the cover sheet to approve submission and presentation of the Dissertation Plan.

The oral presentation constitutes the student's first Dissertation Committee meeting with the Dissertation Advisor serving as Chair and the Comprehensive Examination Chair also present as a temporary member of the Dissertation Committee. If any significant revisions are requested by the Committee, they are due one week following the Dissertation Committee meeting.

Committee approval indicates that the student has given an acceptable first presentation of his/her dissertation research project, that the subject has the potential for development into a successful dissertation, and that the student is making adequate progress in the program. The Dissertation Plan and its signed cover sheet will be included in the student's academic dossier found in the Program Office.

XIV. **Comprehensive Exam:**

Following approval of the Dissertation Plan, the student shall complete the Comprehensive Examination. It is a written and oral examination completed by each student by the end of his/her second full year of training in the Molecular Medicine Program. It is administered by the Comprehensive Examination Committee.

A. Comprehensive Examination Committee Membership:

The five-member Comprehensive Examination Committee is the Dissertation Committee *excluding* the Ph.D. Dissertation Advisor, plus the addition of a Chair. The Chair of the Comprehensive Examination Committee must be an active faculty member in the

Molecular Medicine Program and is chosen by the student in close consultation with the Dissertation Advisor. *Before* beginning the fourth semester (Year 2, Spring semester) of graduate training in the Program, the student shall identify his/her Comprehensive Examination Committee Chair. This Committee Chair must be approved by the Graduate Studies Committee and the Program Director.

By February 1, the Program Director and/or the Director of Graduate Studies shall meet with all second year Molecular Medicine graduate students to (a) describe the examination procedures, (b) discuss expectations for the specific aims, proposals and examination, and (c) answer any questions the students may have about the process.

B. Timetable:

Students are expected to complete the Comprehensive Examination, both written and oral components, before the beginning of their third year in the Molecular Medicine Program. The preliminary Specific Aims document (see below) can be submitted to the Comprehensive Examination Committee any time after approval of the Dissertation Plan, but must be submitted before April 1. The Committee evaluation of the Specific Aims will be returned to the student within 1 week. A rejected Specific Aims must be revised and resubmitted within 3 weeks. The Committee has 1 week to evaluate the resubmitted Specific Aims. The Specific Aims must be accepted by a majority vote of the Committee before a student can proceed with development of a full proposal.

Following acceptance of the Specific Aims, the student must submit the written proposal within 6 weeks. The Committee will have 2 weeks to review the written document. The oral presentation to defend the written proposal should be scheduled as soon after the 2 weeks as possible, or at the convenience of the Committee. Typically, the oral defense examination date is dependent upon the availability of the Committee members. It is expected that all examinations of second year students will be completed by July 15 (in advance of the end of Year 2 in graduate training).

Sample timelines:

February 15	Dissertation Plan Submission		
March 1	Oral Presentation of Dissertation Plan		
April 1	Submit Comprehensive Exam Specific Aims		
If Specific Aims Are Accepted		If Specific Aims Are Not Accepted	
April 8	Committee evaluates and accepts Specific Aims	April 8	Committee asks that Specific Aims be revised
May 20	Submit written proposal	April 29	Submit revised Specific Aims
June 3	Oral defense of proposal	May 6	Committee accepts revised Specific Aims
		June 17	Submit written proposal
		June 31	Oral defense of proposal

C. Topic and Preparation of Written Comprehensive Exam Specific Aims and Proposal:

The Comprehensive Exam Specific Aims and Proposal (see below for details) must be the products of the student's independent preparation and must be on a topic relevant to molecular medicine.

The student selects the topic which can be that of his/her dissertation research (on-topic) or on a different topic (off-topic), but note that on-topic proposals should facilitate the submission of a predoctoral fellowship application as required by the Program (see *External Fellowship Application Requirement* below). Ideas for off-topic proposals may arise from seminars, coursework, journal clubs, and/or the current literature. The proposal should be generated using the guidelines for an individual NIH F31 research fellowship, as revised for March, 2017. Instructions for writing NIH grants can be obtained from most Molecular Medicine faculty or from the University's Office for Sponsored Programs.

The student's dissertation advisor shall have no input into the development and preparation of the Specific Aims or Proposal, other than the normal discussions occurring in the course of the student's thesis research (Note: Both the student and the dissertation advisor shall sign the Comprehensive Examination Assurance Form that is submitted with the Comprehensive Exam document).

Students are encouraged to consult with other students, post-docs, and faculty who are not members of his/her Comprehensive Examination Committee. For the Comprehensive Examination, the student prepares and orally defends a written research proposal. A "mock" practice examination with fellow students prior to the actual Comprehensive Examination is strongly recommended.

Specific Aims

Purpose: The purpose of the specific aims is to describe concisely and realistically the goals of the proposed research and summarize the expected outcome(s), including the impact of the proposed research will exert on the research fields involved.

Content: The specific aims should cover:

- broad, long-term goals
- the specific objectives and hypotheses to be tested
- summarize expected outcomes; and
- describe impact on the research field

Suggestions:

1. Generally, the Specific Aims section should begin with a brief narrative describing the long-term goals or objectives of the research project and the hypothesis to be tested. This is followed by a numbered list of the Aims.
2. List succinctly the specific objectives of the research proposed, e.g., to test a stated hypothesis, create a novel design, solve a specific problem, challenge an existing paradigm or clinical practice, address a critical barrier to progress in the field, or develop new technology.
3. Make sure your specific objectives or hypothesis are clearly stated, are testable, and adequately supported by citations and preliminary data. Be sure to explain how the results to be obtained will be used to test the hypothesis.
4. Be as brief and specific as possible. For clarity, each aim should consist of only one sentence. Use a brief paragraph under each aim if detail is needed. Most successful applications have 2-4 specific aims.
5. Don't be overly ambitious. A small, focused project is generally better received than a diffuse, multifaceted project.
6. Be certain that all aims are related, but not so interdependent that the outcome of one aim could make others superfluous. Have someone read the aims for clarity and cohesiveness.
7. Focus on aims where you have good supporting preliminary data and scientific expertise.

D. Specific Aims:

The student shall provide each member of the Committee with a Specific Aims document describing a topic (see above) that will serve as the basis of their Comprehensive Exam Proposal. The student may consult with the Comprehensive Examination Committee to discuss the chosen topic and ensure that it represents an appropriate area for development. Instructions regarding the format and content of the Specific Aims document are given below.

In addition, the student should provide the Examination Committee a list of a few key references. The Comprehensive Examination Committee will decide if the Specific Aims are appropriate for development into a full proposal for subsequent examination. If the Specific Aims document is judged to be flawed or poorly developed, then the student will be asked to revise the Specific Aims. The Committee may make this decision via email or they may meet to fully discuss the submitted Specific Aims. The Committee may also request to meet with the student to more fully discuss the Specific Aims. When the Specific Aims document is accepted by the Comprehensive Examination Committee, the student may write the full proposal as described below.

The Specific Aims document is to be prepared in the form of an NIH-style Specific Aims page document and should:

- State concisely the goals of the proposed research and summarize the expected outcome(s), including the impact that the results of the proposed research will exert on the research field(s) involved.
- List succinctly the specific objectives of the research proposed, e.g., to test a stated hypothesis, create a novel design, solve a specific problem, challenge an existing paradigm or clinical practice, address a critical barrier to progress in the field, or develop new technology.

The Specific Aims must be one-page in length, single-spaced, with at least one-half inch margins (top, bottom, left, and right), in Arial or Helvetica font of size 11 points.

Examples of successful Specific Aims documents are available from the Program office. The following suggestions for writing an effective Specific Aims document are adapted from those found in a *Quick Guide for Grant Applications* provided by the NIH: (<http://deainfo.nci.nih.gov/extra/extdocs/gntapp.pdf>).

E. Comprehensive Examination Proposal:

The final version of the proposal should be prepared in the general narrative style of an individual NIH F31 research fellowship, as revised for March, 2017. Instructions for writing NIH grants can be obtained from most Molecular Medicine faculty or from the University of Iowa Division of Sponsored Programs. The best proposals are simply and clearly written and have been revised by the student several times to achieve the most concise presentation. The following is taken from the NIH F31 application instructions. The format for each proposal is as follows:

I. Cover sheet:

Include the application title, student's name, and submission date.

II. Project Summary/Abstract:

(30 lines of text, following the required text formatting and margin specifications – see below)

State the application's broad, long-term objectives and specific aims, if possible making reference to the health-relatedness of the project. Describe concisely the research design and methods for achieving the stated goals. This section should be informative to other persons working in the same or related fields and insofar as possible understandable to a scientifically or technically literate reader.

III. Specific Aims:

(1 single-spaced page)

State concisely the goals of the proposed research and summarize the expected outcome(s), including the impact that the results of the proposed research will exert on the research field(s) involved. List succinctly the specific objectives of the research proposed, e.g., to test a stated hypothesis, create a novel design, solve a specific problem, challenge an existing paradigm or clinical practice, address a

critical barrier to progress in the field, or develop new technology. (This will generally be a revised version of the earlier Specific Aims document submitted.)

IV. Research Strategy:
(6 single-spaced pages)

Organize the Research Strategy in the specified order and using the instructions provided below. Start each section with the appropriate section heading – Significance, Innovation, Approach. Cite published experimental details in the Research Strategy section and provide the full reference in the References Cited section.

a. Significance

1. Explain the importance of the problem or critical barrier to progress in the field that the proposed project addresses.
2. Explain how the proposed project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields.
3. Describe how the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field will be changed if the proposed aims are achieved.

b. Innovation

1. Explain how the application challenges and seeks to shift current research or clinical practice paradigms.
2. Describe any novel theoretical concepts, approaches or methodologies, instrumentation or interventions to be developed or used, and any advantage over existing methodologies, instrumentation, or interventions.
3. Explain any refinements, improvements, or new applications of theoretical concepts, approaches or methodologies, instrumentation, or interventions.

c. Approach

1. Describe the overall strategy, methodology, and analyses to be used to accomplish the specific aims of the project. Include how the data will be collected, analyzed, and interpreted.
2. Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the aims.
3. If the project is in the early stages of development, describe any strategy to establish feasibility, and address the management of any high risk aspects of the proposed work.
4. Point out any procedures, situations, or materials that may be hazardous to personnel and precautions to be exercised.

If an applicant has multiple Specific Aims, then the applicant may address Significance, Innovation and Approach for each Specific Aim individually, or may address Significance, Innovation and Approach for all of the Specific Aims collectively.

V. References Cited:

Provide full citations to literature referenced in the research plan, including all authors, titles of papers, and full journal citations.

VI. Appendix:

Attach electronic versions of 2-3 key papers for the Examination Committee. The proposal, including the Project Summary page, Specific Aims page, and Research Strategy, but exclusive of the References Cited, is limited to eight pages in length.

All text must be single-spaced, with at least one-half inch margins (top, bottom, left, and right), in Arial or Helvetica font of size 11 points. The proposals shall not include the personnel and financial pages of a conventional NIH grant.

VII. Comprehensive Examination Assurance Form (with signatures):

Form provided by the Program which must be submitted as a separate document at the time of the Comprehensive Exam submission.

a. Oral Comprehensive Examination:

The student defends their written proposal in the Oral Comprehensive Examination. This oral examination is intended to test the student's knowledge of important background material or subject matter needed for a full interpretation of the proposed experiments.

As described in the *Manual of Rules and Regulations of the Graduate College, The University of Iowa*: "This examination, administered only on campus, is intended to be an inclusive evaluation of the candidate's mastery of the major and related fields of study, including the tools of research in which competence has been certified."

The Comprehensive Examination Committee's questioning of the student is not strictly limited to the topics presented in the proposal. In practice, the examination will usually concentrate on subjects related to the proposal; however, the student should review and be prepared to discuss all aspects of fundamental molecular and cellular biology. The oral examination is usually about two hours in length.

b. Outcomes of the Comprehensive Examination:

Based on the student's performance on the Comprehensive Examination (oral and written), the Examination Committee usually makes one of three possible recommendations to the Graduate College.

1. Satisfactory

The student passes the Comprehensive Examination and proceeds toward completion of the Ph.D. degree.

2. Reservations

The Examination Committee has reservations on minor but essential and significant points. The student is given the opportunity to eliminate these reservations by revising the proposal within a time limit as specified by the Committee. The Comprehensive Examination Committee Chair will inform the student in writing and outline the deficiencies and remedies required to remove the reservations. The Committee may either ask for another

meeting with the student or make its decision based on the revised document provided by the student.

3. Unsatisfactory

The Examination Committee identifies major deficiencies, and the student is not recommended for continuation in the Ph.D. program.

However in accordance with the Manual of Rules and Regulations of the Graduate College, University of Iowa, the student may consult with his/her advisor and opt to make a second effort to successfully pass the Examination. If the student elects to try a second time, he/she will follow the instructions of the Comprehensive Examination Committee. This may include making significant revisions to the first proposal, additional preparation for the oral defense (e.g. an additional course), or may require development of a new proposal that would require submission of a new original Specific Aims document. The revised proposal or Specific Aims cannot be submitted sooner than 4 months and no longer than 6 months after the first examination. The examination process and timetable described above is followed. The same committee will administer this examination.

XV. External Fellowship Application Requirement

Following successful completion of their Comprehensive Exam (or before if circumstances warrant), students should begin working on submission of an external fellowship application to satisfy a program requirement. Obtaining an external fellowship is a noteworthy achievement for a graduate student that can promote their career advancement and conserve research funding resources of the mentor laboratory, and submitting a research proposal is a valuable training exercise for predoctoral students.

All Molecular Medicine students are therefore required to submit a fellowship to an external funding agency (e.g. NIH, American Heart Association, etc.) within one year of completing their comprehensive exam or by a date that is mutually agreed upon by the student, the Dissertation Advisor, and the Molecular Medicine program.

The student should discuss with their Dissertation Advisor the plan and time-table for proposal submission as soon as possible following (or before) completion of their Comprehensive Exam, and relay their plans for submission to the Program. Possible considerations here are the student's expected time to completion of degree, the specific requirements of the funding agency, the duration of the fellowship support, and the possible need to submit a revised application.

As an additional incentive for submission of extramural predoctoral fellowship proposals, the Graduate College awards graduate students \$500 for submission of an application and the College of Medicine provides a \$2000 fiscal year stipend supplement for a funded application. To qualify for the \$500 incentive, you will need to work with a Graduate College fellowships advisor prior to submitting your nationally competitive fellowship application, work with a faculty advisor prior to submitting your nationally competitive fellowship application, and apply

for an eligible nationally competitive fellowship. More information regarding the University of Iowa Fellowship Incentive Program is available through the following link:

<https://www.grad.uiowa.edu/fellowship-incentive-program>.

XVI. Post-comprehensive dissertation committee meetings

The Dissertation Committee shall meet with the student at least once a year (near the end of the third and subsequent years) and is available for consultation and advice at any time.

If at all possible, the student is strongly encouraged to coordinate and to schedule his/her presentation of research at the Molecular Medicine Workshop/Seminar with a Dissertation Committee meeting. The annual meetings are intended to help the student (and the mentor) evaluate his/her progress and to anticipate potential problems.

Prior to each Dissertation Committee Meeting, the student should prepare a brief report summarizing their research progress and enumerating future goals and distribute this report to the committee members several days prior to the meeting. Following Dissertation Committee Meetings, the student and mentor must file a brief progress report annually with the Molecular Medicine Program Office.

Prior to actual writing of the Ph.D. dissertation, the Committee should review with the student, in a special meeting if needed, all of the material to be incorporated into the dissertation. The purpose of this meeting, which usually occurs 4-6 months before the final examination, is to ensure that the student and the Dissertation Committee agree in general terms on the material to be included in the dissertation. Prior to this meeting, the student should prepare a more comprehensive progress report in the form of a thesis outline.

XVII. Individual Development Plans:

Individual Development Plans (IDPs) are tools used by graduate and postgraduate students to formulate career goals and promote progress towards their achievement. The Molecular Medicine Program, in concordance with NIH recommendations for their trainees, requires that all Program students complete a Individual Development Plan (IDP) and update this plan annually. Students will (together with their thesis advisor if applicable) complete/update their IDPs by January 15 of each year in the Program, after first taking advantage of an interactive, online career planning tool initially developed by FASEB (Federation of American Societies for Experimental Biology) (<http://myidp.sciencecareers.org/>). Information and an IDP form will be provided by the Program Office.

XVIII. Food & Beverage for Meetings

The Molecular Medicine Graduate Program does not expect students to provide food and/or beverages for Committee meetings, Comprehensive Exams, or defenses. Further the lack of food/beverages will not be looked at negatively by those attending. This is supported by the Graduate Student Senate Resolution Addressing Food at Meetings.

XIX. **Policy for Paid Leaves, Holidays, and Unpaid Leaves of Absence:**

Graduate Students in Biomedical Training Programs under the auspices of the CCOM Office of Graduate and Postdoctoral Studies (Effective Date 8/24/2016)

Kirschstein-NRSA trainees and fellows are eligible for other types of leave (vacations and holidays, sick leave, parental leave) Please refer to NIH Grants Policy Statement at <http://grants.nih.gov/grants/policy/nihgps/nihgps.pdf> and the revised NIH Parental Leave Policy for NRSA's NOT-OD-18-154 at <http://grants.nih.gov/grants/guide/notice-files/NOT-OD-18.154.html>

Currently enrolled University of Iowa PhD students with a 25% or more appointment employed as:

- Teaching Assistants (FT19)
- Research Assistants (FR19-01, FR19-02)
- Graduate students appointed on federal training grants or federal fellowships

A. Paid Leaves

PhD students are entitled to University-designated holidays and up to (15) working days per fiscal year of absence without pay deduction. All paid leave must be scheduled with the approval of the mentor. PhD students may be absent for the University-designated holidays unless the mentor specifically requires the PhD student to work. At such time, the mentor and the PhD student shall schedule alternate paid time off. Mentors will make an effort to minimize holiday work for PhD students and if they require work on a holiday, shall provide PhD student(s) with no less than thirty (30) days written notice, whenever feasible.

I. University-designated Holidays:

- New Year's Day
- Dr. Martin Luther King, Jr.'s Birthday
- Memorial Day
- Independence Day
- Labor Day
- Thanksgiving Day
- Friday after Thanksgiving Day
- Christmas Day
- A day before or after Christmas Day

Monday will be recognized as a holiday for all holidays occurring on a Sunday and Friday for all holidays occurring on a Saturday.

Any further paid leave should have the additional approval of the DEO/Director, which may be granted without financial support.

II. Sick Leave

PhD students may be absent due to illness without loss of pay not to exceed (18) days during a twelve month appointment.

If a PhD student has exhausted paid sick leave due to illness, they may request an unpaid leave of absence which will be granted at the sole discretion of the Program and mentor, and subject to any relevant policies of the Graduate College.

III. Family Illness Leave

PhD students may use available sick leave for care of and necessary attention to ill or injured members of the immediate family or for parental leave including birth and adoption.

IV. Bereavement Leave

PhD students may use available sick leave for three (3) work days when a death occurs in the employee's immediate family.

PhD programs may grant additional paid leave - Such leaves may be granted provided the Program and mentor determine that the PhD student is able to meet the time and effort obligations reflected in the percentage of appointment over the full term of the student's appointment.

V. Unpaid Leave of Absence

A PhD student may be granted an unpaid leave of absence during the term of their appointment, upon request to and at the sole discretion of the Program and mentor.

The Program and mentor shall authorize leave requests in accordance with the provisions of the Family and Medical Leave Act of 1993 for qualifying individuals.

VI. Summer Registration and Tax Information

Graduate students in the Program normally do not register for summer term. There are four exceptions to this:

- (1) Some first-year students who may take courses during their first summer;
- (2) Students taking the Comprehensive Exam during the summer term;
- (3) Students who are defending their PhD during the summer term; and
- (4) Students who have a summer fellowship (e.g., from the Graduate College).

Outside of these exceptions, students will not register for the summer. (This policy is broadly in effect for all of the biomedical science advanced degree programs at the University of Iowa.)

Students should be aware that a tightening of IRS regulations has led to FICA withholding for summer stipend checks for students not registered for the summer term. This can amount to an income loss of about \$300, depending on the student's particular circumstances

For students who are on a training grant fellowship (e.g., T32), it is recommended that the W-4 is changed to withhold taxes from paychecks each month for both federal and state. This will eliminate paying estimated taxes quarterly, and/or associated penalties.

XX. **Final Examination (Thesis Defense):**

The work for the PhD degree culminates in a final oral examination (Thesis Defense) administered on campus.

In accord with Graduate College rules, the Final Examination may not be held until the next session after satisfactorily completing the comprehensive examination; however, a student must pass the final examination no later than five years after satisfactorily completing the comprehensive examination. Failure to meet this deadline will result in a reexamination of the student to determine his or her qualifications for taking the final examination. The procedures to be followed are the same as those for the comprehensive examination (see Section IV.B. above).

The Final Examination is open to the public. Members of the faculty of the Graduate College are especially invited to attend and, subject to the approval of the Thesis Chair, to participate in the examination.

Thesis Defense (Final Examination): The student is required to present to each member of the Thesis Committee a complete copy of the thesis at least two weeks prior to the final defense date. At least two weeks prior to the scheduled exam, the student must submit to the Molecular Medicine Program office the title of your thesis so that the Program office can complete and submit the Graduate College Request for Final Examination form. The student should keep in mind that the date of final deposit for each semester (including summer semesters) is set by the Graduate College, and is the deadline for receipt of the thesis in order to graduate in that semester. Students who are in the final stages of preparing their thesis should check with the Molecular Medicine Program Office for important Graduate College deadlines.

After a formal Thesis Seminar by the student, the thesis committee shall conduct the Thesis Defense as described below.

1. The student, through MyUI, should file an Application for Degree in the Office of the Registrar.
2. The Thesis Defense shall be scheduled, publicized, and conducted in accordance with procedures set forth in the Manual of Rules and Regulations of the Graduate College of The University of Iowa. The Thesis Defense will be conducted immediately following the Thesis Seminar presented by the student. The Defense is an oral examination administered on campus.
3. During the Thesis Defense, the student will answer questions relating to the thesis work. These questions can cover a wide range of topics including the development of the hypotheses in the thesis, the relevant literature, experimental procedures, interpretation, and future directions. Intensive questioning on areas of knowledge constituting the immediate context of the investigation is expected.

Report of Final Examination (Thesis Defense): The report of the Final Examination is due in the Graduate College office not later than 48 hours after the examination. The final examination

will be evaluated as **Satisfactory** or **Unsatisfactory**. Two unsatisfactory votes will make the committee report unsatisfactory. In case of a report of unsatisfactory in the final examination, the candidate may not present himself or herself for reexamination until the next session. The examination may be repeated only once, at the option of the Molecular Medicine Program.

B. Publication Requirement:

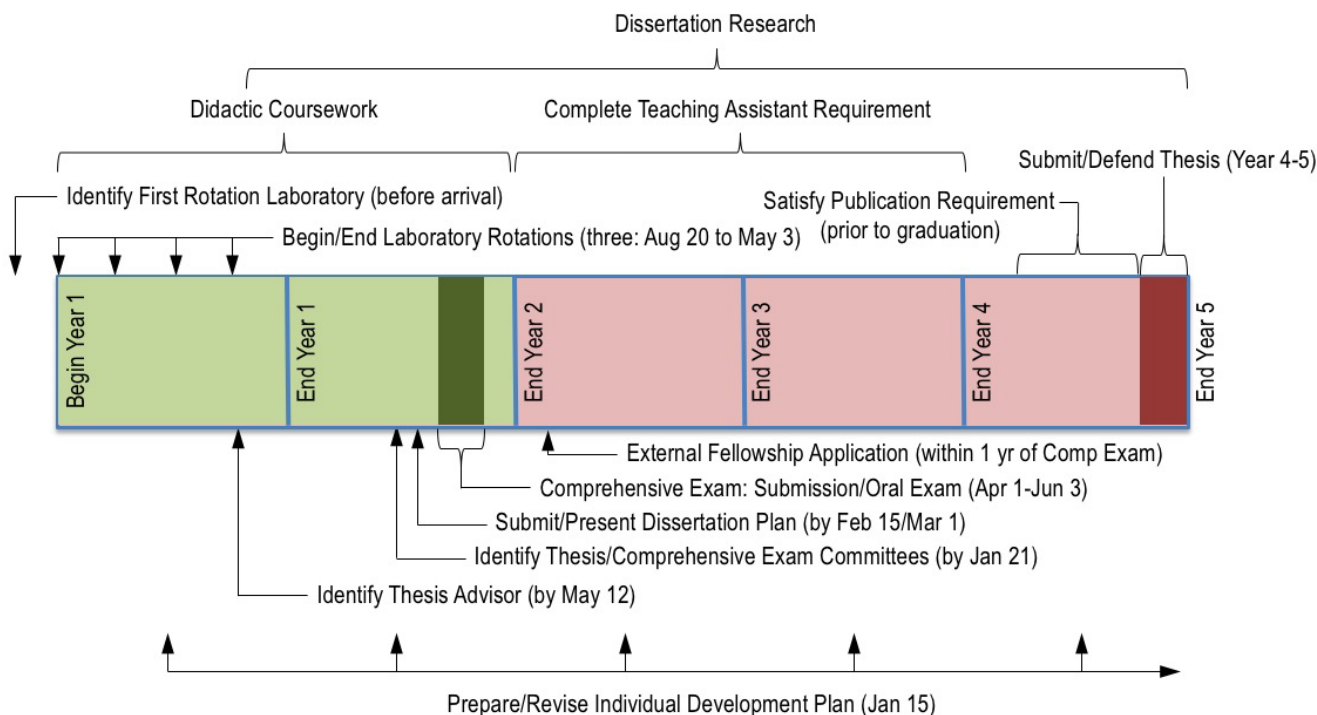
Prior to scheduling your dissertation defense, MMED graduate students must meet one of the following requirements.

1. Students must have one first-author publication accepted in a peer-reviewed journal. A co-first-authored peer-reviewed publication will count towards this requirement.

OR

2. Students have a first-author manuscript that has been deposited in bioRxiv and has been submitted for publication in a peer-reviewer journal. In addition, this manuscript that will be, or has been, deposited in bioRxiv **MUST** be reviewed and approved by the student's dissertation committee as acceptable prior to scheduling a defense.

Timeline: Molecular Medicine Graduate Program Training



XXI. **Petitions and Appeals Procedures:**

A. Petitions

Requests for waiver or deferment of a requirement may be submitted in writing to the Program Director. The request letter should be prepared by the student, in conjunction with the student's Advisor/Mentor, and should be signed by both. The letter should provide clear justification for the request. The Program Director will act on the request, by either making a decision directly or passing the request along to the Student Advisory Committee for a recommendation.

B. Appeals

All actions of the Molecular Medicine Program, the Program Director, the Student Advisory and other Committees, and other program units and staff are subject to appeal by the following procedure.

The student must specify in writing the action that is being appealed. This is to be in the form of a letter addressed to the Program Director.

After reviewing the letter of appeal, the Program Director shall appoint a committee of three members from the Molecular Medicine Program faculty. The committee members shall have no direct involvement in the action or incident that is being appealed, and shall be reasonably expected to render an unbiased opinion on the matter at issue.

This committee will examine all documentary information available to it, including items provided by the student and contained in the student's academic file and other Program files as appropriate.

This committee may meet with the aggrieved party or parties for oral discussions of the appeal, and may also meet with other individuals involved in the dispute.

Within one month of being convened, this committee shall present a written report to the Program Director, which will include recommendations for resolution of the appeal.

The Program Director shall report these recommendations to the Executive Committee and/or the Dean of the Graduate College.

The Executive Committee shall be the final arbiter on all appeals relating to Program Policies within its purview. The Dean of the Graduate College shall decide all appeals arising from rules and regulations of the Graduate College.

The Program Director shall inform the student(s) within one week following decisive action on the appeal.

XXII. **Sexual Harassment**

The University of Iowa has clearly stated guidelines and regulations pertaining to sexual harassment. A copy of these rules is available from the Graduate College, <https://www.grad.uiowa.edu/faculty-staff/policies/sexual-harassment-policy> and the University of Iowa Operations Manual, <https://opsmanual.uiowa.edu/community-policies/sexual-harassment>, and is required reading for all incoming students.

XXIII. **Counseling Resources**

The University of Iowa has clearly stated guidelines and regulations pertaining to sexual harassment. A copy of these rules is available from the Graduate College, <https://www.grad.uiowa.edu/faculty-staff/policies/sexual-harassment-policy> and the University of Iowa Operations Manual, <https://opsmanual.uiowa.edu/community-policies/sexual-harassment>, and is required reading for all incoming students.

XXIV. **Office of the Ombudsperson**

The Office of the Ombudsperson provides conflict management and problem solving to the entire campus community. Their services are confidential, neutral, informal, and independent. Appointments are suggested and can be scheduled by phone or by email, ombudsperson@uiowa.edu. Detailed information is available on their website: <https://uiowa.edu/ombuds/>.

XXV. **Appendix:**

Best Practices for Graduate Students and their Research Advisors

The progress, development and success of a graduate student hinges on the commitment of both the student and the research advisor. Basic principles of best practices in mentoring and graduate student life appear in the two lists that follow. Graduate students should be aware of what is necessary for their success and their advisors likewise should be aware of practices that promote their students' best interests.

Although the concepts of commitment and responsiveness underlying the lists of expectations apply to all disciplines, the specifics of these principles vary considerably among the biological sciences, physical sciences, social sciences, and humanities. The following guidelines are generally construed and are generally appropriate for students in the Molecular Medicine Program, but not every detail will apply to every student.

A. Expectations of Graduate Students

- a. A graduate student has the primary responsibility for successful completion of his or her degree. A graduate student should be committed to his or her graduate education and should demonstrate this by efforts in the classroom and in research. A graduate student is expected to maintain a high level of professionalism, self-motivation, engagement, excellence, scholarly curiosity, and ethical standards.
- b. A graduate student should meet regularly with the dissertation advisor and provide updates on the progress and results of ongoing research.
- c. A graduate student should be knowledgeable of the policies and requirements of the graduate program, the graduate college, and the institution. The student should strive to meet these requirements, including teaching responsibilities.
- d. A graduate student should work with the dissertation advisor to develop a thesis/dissertation project. This will include establishing a timeline for each phase of the work. The student should strive to meet the established deadlines.
- e. A graduate student should work with the dissertation advisor to select a thesis/dissertation committee. The student should meet with this committee at least annually (or more frequently, according to program guidelines) and be responsive to the advice of and constructive criticism from the committee.
- f. A graduate student should discuss policies on authorship and attendance at professional meetings with the dissertation advisor. The student should work with the advisor to submit all relevant research results that are ready for publication in a timely manner prior to graduation.
- g. A graduate student should attend and participate in meetings, seminars and journal clubs that are part of the educational program.

- h. A graduate student should contribute to maintaining a research environment that is intellectually stimulating, emotionally supportive, safe, and free of harassment.
- i. A graduate student should participate in the institution's Responsible Conduct of Research Training Program and practice those guidelines in conducting thesis/dissertation research.
- j. A graduate student should discuss policies on work hours, sick leave and vacation with the dissertation advisor or graduate director. The student should consult with the advisor in advance of any planned absences.
- k. A graduate student should acknowledge primary responsibility to develop a career following the completion of the doctoral degree. The student should seek guidance from available resources, including the dissertation advisor, career counseling services, thesis/dissertation committee, and any other mentors.
- l. A graduate student should comply with all institutional policies, including academic program milestones. The student should comply with both the letter and spirit of all best practices and policies of the institution.

B. Expectations of Dissertation Advisors

- a. The dissertation advisor should be committed to the education and training of the graduate student as a future member of the research community.
- b. The dissertation advisor should meet one-on-one with the student on a regular basis. The advisor should provide timely feedback on the student's written work to facilitate ongoing progress on the thesis/dissertation.
- c. The dissertation advisor should be knowledgeable of the requirements and deadlines of his/her graduate program as well as those of the institution, including teaching requirements and human resources guidelines. The dissertation advisor should guide the student in these areas to ensure academic and professional success.
- d. The dissertation advisor should help to plan and direct the graduate student's project, set reasonable and attainable goals, and establish a timeline for completion of the project. The dissertation advisor should anticipate conflicts between the interests of externally funded research programs and those of the graduate student, and should help keep these interests from interfering with the student's thesis/dissertation research.
- e. The dissertation advisor should help a graduate student select a thesis/dissertation committee. The advisor should assure that the committee meets at least annually (or more frequently, according to program guidelines) to review the graduate student's progress.

- f. The dissertation advisor should discuss authorship policies regarding papers with the graduate student. The advisor should acknowledge the graduate student's contributions and work with the graduate student to present and publish his/her work.
- g. The dissertation advisor should encourage the graduate student to attend scientific/professional meetings and make an effort to secure and facilitate funding for such activities.
- h. The dissertation advisor should provide an environment for his/her graduate students that is intellectually stimulating, emotionally supportive, safe, and free of harassment.
- i. The dissertation advisor should discuss intellectual policy issues with the student regarding disclosure, patent rights and publishing research discoveries.
- j. The dissertation advisor should not require the graduate student to perform tasks unrelated to his/her academic and professional development.
- k. The dissertation advisor should provide career advice and assist in finding a position for the graduate student following his/her graduation. The advisor should provide honest letters of recommendation and be accessible for advice and feedback on career goals.
- l. The dissertation advisor should lead by example and facilitate the training of the graduate student in complementary skills needed to be a successful researcher, such as oral and written communication, grant writing, lab management, animal and human research policies, the ethical conduct of research, and scholarly professionalism. The advisor should encourage the student to seek opportunities in teaching, if not required by the student's program.
- m. In disciplines where it is customary, the dissertation advisor should provide financial resources for the graduate student to facilitate the student's thesis/dissertation research. Advisors have the prerogative to pay their student's mandatory fees associated with submitting a dissertation, including a degree application fee, a publication and binding fee, and a thesis fee. However, they are not required to do so.

The University of Iowa prohibits discrimination in employment, educational programs, and activities on the basis of race, creed, color, religion, national origin, age, sex, pregnancy, disability, genetic information, status as a U.S. veteran, service in the U.S. military, sexual orientation, gender identity, associational preferences, or any other classification that deprives the person of consideration as an individual. The university also affirms its commitment to providing equal opportunities and equal access to university facilities. For additional information on nondiscrimination policies, contact the Director, Office of Equal Opportunity and Diversity, the University of Iowa, 202 Jessup Hall, Iowa City, IA, 52242-1316, 319-335-0705 (voice), 319-335-0697 (TDD), diversity@uiowa.edu.