SCHOOL OF MEDICINE AND DENTISTRY

STUDENT HANDBOOK
FOR THE PH.D. DEGREE PROGRAM IN

GENETICS, DEVELOPMENT, AND STEM CELLS.

2019

This handbook was prepared to supplement but not replace the Official Bulletin of Graduate Studies, which should be reviewed by all students.

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1. PREFACE

1.1. Program Goal

The primary goal of the GDSC graduate program is to provide state-of-the-art, research-intensive education for students seeking to obtain a Ph.D. degree in the study of development and disease using modern genetic approaches. The program provides students with the research and teaching skills necessary to become successful and independent scientists employed in academic, government, and corporate settings. Successful completion of the graduate program culminates in the granting of the Ph.D. degree in Genetics.

1.2. The Ph.D. program in Genetics, Development and Stem Cell Program (GDSC)

Students in the Genetics, Development and Stem Cell Program will receive a Ph.D. in Genetics. Although the Ph.D. in Genetics is primarily a research degree, it includes a breadth of education in areas that are not directly related to the thesis research project. To achieve the full potential of this career-oriented training program, students will participate in multiple training opportunities including formal graduate level courses, seminars and lectures, teaching assistantships, mentorship programs and science communication activities through conference presentations, peer-reviewed publications and outreach activities.

The GDSC Program is an interdepartmental degree program administered through the Department of Biomedical Genetics in the School of Medicine and Dentistry. The GDSC program currently encompasses 62 faculty, with specialties in 14 different disciplines. The faculty is composed of primary and secondary faculty in the Department of Biomedical Genetics, and additional faculty associated with the GDSC program through research interests in genetics, cancer biology, and animal and stem cell models of development and disease. This interdisciplinary nature of the program represents one of the key hallmarks and strengths of the program, challenging students to think outside the box and to apply their skills to distinct scientific questions.

The GDSC PhD Program is primarily responsible for education and counseling in the first two years of graduate studies leading up to the Qualifying Exam, with some continuing responsibilities for graduate student education in subsequent years. During the first two years students fulfill core course requirements and perform laboratory rotations. Following the first year of study, students select their research advisor and lab. Students in the GDSC program may select a research mentor from any of the program affiliated faculty, as well as faculty from other programs upon approval by the GDSC program director.

1.3. The GDSC Program Handbook and Related Resources

This handbook summarizes the policies that are unique to the Genetics, Development and Stem Cell (GDSC) PhD Program at the University of Rochester. Additional details and regulations concerning graduate study at the University of Rochester can be found in the online Trainee Handbook, which is part of the Graduate Education and Postdoctoral Affairs (GEPA) website. These include the Graduate Studies Bulletin (https://www.urmc.rochester.edu/education/graduate/trainee-handbook/policies-benefits.aspx) and the Regulations and University Policies Concerning Graduate Studies (http://www.rochester.edu/GradBulletin/PDFbulletin/Regulations10-12.pdf). It is expected that students and faculty mentors regularly consult all resources as policies, guidelines, and deadlines continue to evolve in response to the changing needs of the graduate program and to new or modified rules.

1.4. Program Administration

Director and Admissions Chair:
Chris Proschel, Ph.D. Office: KMRB 2-9629 Tel: (585)-273 5368
Program Coordinator:
Michael Powers Office: KMRB 2-9644 Tel: (585) 273-1447

2. ADMISSION TO THE GDSC PROGRAM

2.1. Prospective GDSC PhD Candidates

Building a strong team also means embracing a diverse group of students and mentors. Our faculty and students come from over a dozen different countries around the world, and have varied cultural backgrounds. We encourage both domestic and international students with a Bachelor or Master's degree, or their international equivalent, to apply.

2.2. What are the qualities of a successful PhD applicant?

Every GDSC program PhD graduate is unique, just as the novel discoveries that they contribute to the field of science are unique. Though there are many qualities that go into the making of a successful PhD candidate, some characteristics are shared by all our students and faculty: an open mind to new ideas, the commitment to make every moment count in both the classroom and the lab, and a hunger to learn and grow our knowledge and skill sets.

Candidates that have demonstrated their interest in research, both in their course work and through seeking out research opportunities, will be given preference. A solid foundation in biochemistry, molecular and cell biology will also prepare students for our rigorous training program.

2.3. What are the Admissions prerequisites?

The Admissions Committee takes a holistic approach to assessing student qualifications and goals. There are some important requirements for your application. These include a transcript of undergraduate training, a minimum of three reference letters. The **Graduate Record Examination (GRE)** or equivalent is *not required*, however test scores can be submitted voluntarily and will then be considered as part of a comprehensive evaluation. In addition, **The Test of English as a Foreign Language (TOEFL)** or the **International English Language Testing System (IELTS)** is a requirement for applicants whose primary language is not English. Test results should be submitted with institution code 2948.

2.4. How are Admissions decisions made?

Admission to the GDSC graduate program is on a competitive basis, and decisions are made by an Admissions Committee. After careful review of all application materials, prospective candidates are invited for an interview that will also provide an opportunity for applicants to meet faculty and student researchers in our program. In addition to prior academic training and performance, research aptitude, letters of reference, and personal statement will aid selection of the most qualified applicants.

Students may also apply to transfer into the GDSC program from any of the other UR Graduate Programs, pursuant to approval by the Program Director. Applicants will be required to submit a current curriculum vitae, copies of undergraduate and graduate school transcripts, and to interview with members of the Admissions Committee.

3. CURRICULUM FOR THE PhD IN GENETICS

3.1. Overview

The graduate curriculum consists of several key components: (1) core course requirements, (2) seminar requirements, (3) elective course requirements, and (4) experimental and/or computational research. In this context, research is the most important part of this Ph.D. program. As such, the Ph.D. degree is awarded only after a student has conducted an independent. research project, and successfully written and defended a dissertation that demonstrates a high level of research aptitude, intellectual competence and original thought. Students are expected to publish their thesis work in peer-reviewed journals by the time of their defense.

Additional requirements that constitute an important part of the PhD training program but that are not part of the course curriculum are: (1) Teaching assistantships, (2) Mentorship training, (3) Individual development plan (IDP) and career counseling, (4) Science communication and Outreach. These activities are detailed in section 8. In addition, the student will be subject to the requirements of the advisor's sponsoring department.

3.2. GDSC Program Course Requirements

A minimum of 96 credit hours are required for the Ph.D. degree. Of these, a minimum of 24 credit hours of course work and 8 credit hours of participation in GEN 503/504 are required, with the remaining credit hours awarded for satisfactory research work relating to the thesis project. Program course requirements are meant to be sufficiently flexible to accommodate students with diverse backgrounds and career goals. Students should consult with their advisor or the Graduate Studies Director for curriculum advice (students in their first year of studies are advised by the GDSC Program Director). Certain courses or their equivalent are specifically required. For information on requesting exemptions of this requirements see 3.9. A catalogue of course descriptions can be found at: https://cdcs.ur.rochester.edu/

3.3. Courses required in the first two years of study

Year 1 Fall Semester ***(16 Credits)***

Course Number	Title
IND 431 (5 Credits)	Foundations in Modern Biology I
IND 501 (1 Credit)	Ethics & Professional Integrity
GEN 503 (1 Credit)	Genetics Seminar*
GEN 507 (4 Credits)	Advanced Genetics & Genomics
GEN 595 (5 Credits)	Ph.D. Research Rotation**

Year 1 Spring Semester ***(16 Credits)***

Course number	Title
IND 432 (5 Credits)	Foundations in Modern Biology II
IND 419 (3 Credits)	Intro to Quantitative Biology
GEN 504 (1 Credit)	Genetics Seminar*
GEN 595 (7 Credits)	Ph.D. Research Rotation**

Year 2 Fall Semester ***(total 16 Credits)***

Course Number	Title
GEN 503 (1 Credit)	Genetics Seminar*
GEN 595	Ph.D. Research**
Electives	

Year 2 Spring Semester ***(total 16 Credits)***

Course number	Title
GEN 504 (1 Credit)	Genetics Seminar*
GEN 595	Ph.D. Research**
Electives	

* Required each semester throughout the course of study and includes yearly presentations beginning at the end of year 2

** The number of credits given for GEN 595 varies depending on if an elective is taken and how many credits is given for the elective. A total of 16 credits in the fall and spring semesters must be maintained.

3.4. Electives

Elective courses offer in-depth training in specialized areas that may be related to the student's research project but falls outside of the general course requirement share by all GDSC students. Electives are selected by the student should reflect the specific interests of the individual student and/or the requirements for specific degree-granting program that the student is interested in. A wide variety of courses are available for consideration and the student should consult with the Program Director, Ph.D. research advisor and course directors regarding the suitability and prerequisites of any given course. It should be noted that course offerings change constantly and the student should consult the course catalogue (https://cdcs.ur.rochester.edu/).

Fall Semester

Course Number	**Title**
GEN 508 (4 Credits)	Genomics and Systems Biology
PTH 507 (3 Credits)	Cancer Biology
BIO 426 (4 Credits)	Developmental Biology
NSC 512 (5 Credits)	Cellular Neuroscience
IND 426 (2 Credits)	Science Communication
MBI 406 (3 Credits)	Biomanufacturing
MBI 473 (3 Credits)	Immunology

Spring Semester

Course Number	**Title**
GEN 506 (4 Credits)	Stem Cell Biology (alt years-even)
BST 467 (3 Credits)	Applied Statistics in the Biomedical Sciences (R)
IND 443 (4 Credits)	Eukaryotic Gene Organization & Expression I
IND 447 (4 Credits)	Signal Transduction
NSC 525 (3 Credits)	Biology of Neurological Disease
IND 439 (2 Credits)	Leadership and Management for Scientists
MBI 421 (3 Credits)	Microbial Genetics and Physiology
MBI 456 (4 Credits)	General Virology
BCH 412 (5 Credits)	Advanced Topics in Biological Macromolecules

3.5. Genetics Seminar Series Requirement (GEN 503/504)

All students will register for the Department of Biomedical Genetics student seminar series: GEN 503 (Fall)/ GEN 504 (Spring). As part of course participation, students will present their research project at least once during every academic year. Students will present for the first time at the end of year one, at which time students will present their research work from one of their lab rotations. In addition, full credit requires attendance at a minimum of 60% of the seminars in each semester. If a student fails to attend 60% of the student seminars in a given semester, he/she will be given an "I" (incomplete) for the course.

In the following semester, the student must attend the number of seminars missed in the previous semester in addition to the 60% requirement. If the requirement is not met in the following semester an IE grade will be recorded on the student's permanent record.

Non-GDSC program trainees (PhD students and postdocs), who join a research group in the Department of Biomedical Genetics (BMG) are also required to participate in GEN503/504. Non-GDSC program students will present for the first time at the end of year one, at which time students will present their research work from their BMG lab rotation.

3.6. English Courses and Science Communication

The ability to effectively communicate ideas is a critical component of today's team-based research environment. To help GDSC graduate students achieve this goal, the office of Graduate Education and Postdoctoral Affairs (GEPA) offers several scientific writing and English language support programs. Students are encouraged to seek out these training opportunities early in their graduate training, and may be directed to attend English language programs by Program Director.

English Language courses are available through the University of Rochester Global Engagement English Language Program (http://www.rochester.edu/global/programs/english-language-program/). This program offers several classes in General English, Academic Speaking and Academic Writing. The same courses are offered during both Fall and Spring semester. To help identify the best fit, students may attend the first class and decide to drop out and take a different course. GEPA will fund up to $900 per PhD student to take these courses.

Training in **academic writing** (manuscripts, Qualifying Exam, fellowship applications and thesis) is provided through a number of workshops (such as the URBEST Manuscript Writing Bootcamp) and through the Office of Writing Services at the Center for Professional Development. These services are aimed at providing students with the necessary framework and tools to present their ideas and research in an effective manner. Students requiring basic English training should seek out the English language course offerings (https://www.urmc.rochester.edu/education/graduate/professional-development/writing-services.aspx).

3.7. Student Rotations (GEN 595)

All first-year students are required to complete three laboratory rotations during the first year. At the beginning of the academic year, faculty members will present short (15-30 minute) informal lectures (also known as "Fashion Shows") to the incoming students describing their research activities. The goals of this series are to acquaint students with ongoing research in the program and to alert them to opportunities for their laboratory rotations and future Ph.D. research. Attendance at these lectures is mandatory and critical for selection of laboratory rotations.

To sign-up for lab rotations, students are encouraged to first discuss their choices with the Program Director and Peer Mentors. Thereafter, students should contact the principal investigator to discuss a possible lab rotation. It is important that students are aware that lab rotations are a mutual evaluation of suitability and fit between the host lab and the student. Therefore, students should be prepared to be interviewed by the prospective PI for fit and interest, and should be familiar the with the PI's area of research. *While every effort will be made to accommodate the students' wishes, specific rotations cannot be guaranteed, as the number of available training spots per lab are limited.*

Students are expected to complete 3 projects in 3 different laboratories representing more than one area of interest before requesting assignment to a laboratory in which their Ph.D. research project will be completed. If advisable, a student will complete an additional rotation before requesting assignment.

Laboratory rotation dates are as follows:
Rotation #1: October 1 – December 15
Rotation #2: January 1 – March 15
Rotation #3: March 16 – May 31
Summer Rotation: July 1 – August 31

Rotation Proposal: *Prior* to starting a rotation, students must submit a one-page abstract describing the overall problem, hypothesis, approach and expected results of the rotation project. The abstract should include a title, the student and PI name, and should be submitted electronically as a Word document to the program director and coordinator. Proposals are due at rotation start. (Oct.1, Jan.1, March 16, July 1).

Rotation Report: *At the end* of each rotation period, students are expected to (1) give an oral presentation of their work to the host lab, (2) submit a written report to the Program Director and, (3) both student and faculty are required to complete a rotation evaluation that should be submitted to both the GDSC administrator and the Office of Graduate Education. These evaluations will also be used to fulfill the progress report requirements during the first year. Evaluation forms can be found at: https://www.urmc.rochester.edu/education/graduate/forms.aspx#AcademicSupportForms
The written report should include: Title, Abstract, Introduction, Results, Discussion, Methods and References. Figures should be incorporated in-line with the text. There is no page limit. Rotation reports and evaluations are due 2 weeks after end of the rotation.

3.8. Exemptions from Course Work Requirements

All entering students concerned with exemptions from core courses may appeal to the Program Director to determine whether an exemption is appropriate. The student will be required to submit a detailed course description and syllabus of relevant prior course work (as published by the originating institution), including any applicable course work, papers and exams. The request then needs to be reviewed and approved by the course instructor and the Senior Associate Dean of Graduate Education and Postdoctoral Affairs. The instructions and the form for making this request are found on the GEPA website on the forms page at the following link: https://www.urmc.rochester.edu/education/graduate/home/forms.aspx

3.9. Grading System & Performance Evaluations

All required courses, with the exception of Laboratory Rotations, Journal Club, Student Seminar, and Teaching Assistantships, are graded on an A/E system. These exceptions are graded on an S/E system.

A/E System	**S/E System**
A Excellent A-	S Satisfactory
B+	E Failure
B Good	I Incomplete
B-	IE Incomplete and Failure
C Poor	W Withdrawn
E Failure	**N** No Grade Reported
I Incomplete	
IE Incomplete and Failure	
W Withdrawn	
N No Grade Reported	

Satisfactory Progress
Though formally admitted to the Graduate Program in Genetics, Development and Stem Cells, the student must satisfactorily complete minimum course credit requirements, and pass the Qualifying Examination before being formally admitted to candidacy for the PhD degree. Thus, admission to the program does not guarantee a degree. Earning a PhD entails completing all coursework, passing the qualifying exam, moving a research project forward in a substantive and demonstrable manner, writing and defending a thesis, and completing additional program requirements as described in this Handbook in a timely manner.

Detailed policies regarding satisfactory progress can be found in the University's Official Bulletin, "Regulations and University Policies Concerning Graduate Studies": https://www.urmc.rochester.edu/education/graduate/trainee-handbook/policies-benefits.aspx.

One measure of progress is the grade earned in course work. Academic probation results when a student receives a C (or D) grade. **A second grade of C or lower is cause for immediate dismissal from the graduate program. Likewise, a single failing (F) grade results in immediate dismissal from the University.**

General expectations of Graduate Students:
Satisfactory progress is also measured by performance in the research setting, and by meeting required deadlines. The Program Director, Faculty Mentor, and Thesis Advisory Committee evaluate these metrics of progress and performance. Poor performance in these areas can also result in academic probation or dismissal. The following are general expectations of graduate students:

- Contribute to maintaining an environment that is intellectually stimulating, emotionally supportive, safe, and free of harassment.
- Be committed to their graduate education and demonstrate this by their efforts in the classroom and in research, clinical and/or other academic settings.
- Respect the space of others and understand that space, equipment and/or other resources are shared and that care must be exercised, with problems reported as they arise.
- Be knowledgeable of the policies and requirements of their specific graduate program, the Office for Graduate Education and Postdoctoral Affairs, and the institution, and strive to meet these requirements, including meeting the appropriate deadlines.
- Maintain a high level of professionalism, self-motivation, engagement, excellence, scholarly curiosity, and ethical standards.
- Maintain a detailed, organized, and accurate record of their research and/or academic progress as directed by their supervisor/advisor.
- Continuously strive to be knowledgeable of past and current literature that influences their field of study.
- Balance duties and allocate professional time to be academically effective.
- Meet with their thesis/dissertation/project committee at least annually and be responsive to the advice of and constructive criticism from the committee.
- Attend and participate in department meetings, seminars/colloquia, and journal clubs that are part of the educational program.
- Discuss policies on academic work hours, sick leave and vacation with the supervisor/advisor or graduate program director. The graduate student should consult with the supervisor/advisor in advance of any planned absences.
- Complete all pertinent institutional orientations and trainings such as animal training, clinical orientations, HIPAA training, human subject training, new graduate student orientation, safety training, Title IX training, etc.
- Acknowledge that they have primary responsibility to complete their degree or certificate and to develop a career following the completion of their degree or certificate. The graduate student

should seek guidance from available resources, including the supervisor/advisor, the thesis/dissertation/project committee, career counseling services, writing support services, and any other mentors.

Annual evaluations
The GDSC Director reviews the performance of first year graduate students at the end of each semester. Student progress is evaluated based on grades, instructor feedback, rotation evaluations, rotation reports, oral presentations, performance in Genetics Seminar. Students may be placed on academic probation or a mentoring plan based on these evaluations.

Second year students and beyond also receive a written evaluation of their performance from their advisor and thesis committee. The **annual evaluation form** can be found at: https://www.urmc.rochester.edu/MediaLibraries/URMCMedia/education/graduate/documents/Evaluation-Annual.docx)

After completing the Qualifying Exam, the student must meet with his or her Thesis Committee at least annually and file a written progress report with the Program Director within one week of the committee meeting, but **no later than June 1**. This report is reviewed by the GDSC Director and the Senior Associate Dean for Graduate Education. **Scheduling thesis committee meetings is the responsibility of the student and should be done in conjunction with the annual student seminar whenever possible.**

Please follow the guidelines below for annual evaluations:

- Entering into your First year: since you are just entering or will be entering the program you do not need to complete an annual evaluation form; however, you should draft an Individual Development Plan (IDP)
- Entering into your Second year: since you have just chosen a lab you do not need to complete an annual evaluation.
- Entering into your Third year: Please complete the annual evaluation in conjunction with your Qualifying Exam. You do not need to complete the committee report section.
- Entering into your Fourth year and above: You need to complete the entire annual evaluation. In some cases the committee may recommend bi-annual review meetings and reports.

3.10. Sample Timetable

First Year:

October	Begin lab rotation #1, October - December
January	Begin lab rotation #2, January - March
March	Begin lab rotation #3, March - May
May or June	***Select thesis advisor***
May or June	Research Presentation at GEN504 (Genetics Seminar)
June	1st Year Evaluation (Program Director)

Second Year:

Aug-Sep	Prepare GRFP Application (NSF)
Aug-Sep	Select members of QE/thesis advisory committee
Aug-Oct	Thesis research; Qualifying Exam preparation (i.e., set a date; discuss project goals with Thesis Advisor and Thesis Advisory Committee)
Feb-May	Pre-Qual Meeting (first meeting of thesis/QE advisory committee)
June	2nd Year Evaluation (PI/Mentor)

Third Year:

Aug-Oct	***PhD Qualifying Examination*** (Thesis Proposal): This must be completed by October 15 of the 5th semester in residence to maintain good academic standing.
Dec/March	F31 NIH Fellowship Application
June	3rd Year Evaluation (PI/Mentor)

Fourth Year:

Aug-Dec	Annual thesis advisory committee meeting and evaluation
June	4th Year Evaluation (PI/Mentor)

Fifth Year:

Aug-Dec	Annual thesis advisory committee meeting and evaluation; post PhD planning. Write dissertation, Start job applications; defend PhD thesis

4. CHOOSING A RESEARCH ADVISOR

4.1. When to select a mentor

Even if a student feels they have a specific lab in mind to conduct their PhD research, students are required to complete 3 rotations. After completing the research rotations (by June 1st of the first year), students may submit their choices for thesis advisor to the Program Director for approval. Eligible advisors must have the rank of Full, Associate or Assistant Professor with adequate funding support for the student. Every attempt will be made to place the students in their first-choice laboratory, but limitations of space and funding may, in some cases, make it necessary to assign a student to his/her second choice. If a student does not feel prepared to choose a thesis advisor at this time, he/she may elect to do an additional rotation in the summer after the first year.

4.2. Selecting a non-GDSC program advisor

If a student wishes to select a thesis advisor who is *not* a member of the GDSC Program, the student can remain in the GDSC Program with approval of the program director. In this case the student may also be required to attend the Departmental seminar series of the advisor's sponsoring department.

4.3. Co-mentorship requirements

If a student plans to have more than one thesis advisor as part of a collaborative project, the mentors and student must establish a mentoring plan. This is particularly useful and important for PhD candidates who plan to submit future fellowship applications.

a) At the beginning of the dissertation, the co-mentors submit a brief mentoring agreement which describes the nature of the collaborative project, the joint and/or distinct mentoring responsibilities of each PI, and an outline of how the co-mentorship will be handled at a practical level. This should include which lab meetings the student is expected to attend, how often at a minimum will the student meet with each PI/mentor, and in which lab the student will be working most of the time (for contact information purposes).
b) The co-mentors agree to jointly and separately (i.e. either together or individually in case one PI changes his mind later) to be responsible for covering the student's stipend.
c) If the co-mentors are in different departments, one Departmental administrator will be responsible for payroll related matters.
d) Students and advisors are expected to comment on the progress of the co-mentorship as part of the annual evaluation.

5. STUDENT PRESENTATIONS

Experience in organizing research data, interpretation of data, synthesis of information from diverse sources, and presentation to an audience of scientific colleagues represents valuable preparation for a career in science, whether in an academic or industrial setting. Therefore, students will be required to present a yearly seminar in the Genetics Seminar series (GEN 503/504). Students will present for the first time at the end of year one, at which time students will present their research work from one of their lab rotations. All research presentations should include background, hypothesis, approach, results and discussion of results. Presentations will be part of the annual student evaluation.

To development critical thinking skills, all students are expected to be active participants in the course by asking questions and providing constructive criticism to presenters. Active participation in GEN503/504 is expected and will be informally evaluated as part of the annual evaluation.

6. QUALIFYING EXAMINATION

At the end of the 4th semester, all students must complete the Qualifying Exam. The purpose of the Qualifying Examination is to determine whether the student is *qualified and competent* to continue work towards a Ph.D. in Genetics. It is not intended as a test of the proposed research problem *per se* or of the supporting experimental data, but rather as a means of determining the potential of the student for independent thought, his or her comprehension of the general field and capacity for exploring a relevant problem in a scientifically sound manner. For students in the Genetics Program, the QE procedure requires preparation of a written research proposal (see Section 6.4) and a closed, oral exam.

6.1. Selecting a QE Committee

The committee to conduct a qualifying exam must consist of at least **four full-time tenure-track faculty. This includes the advisor**. All members must be appointed at the assistant professor rank or higher. *Two* members must be members of the GDSC Program. The *third* member must be from outside the GDSC Program. The *fourth* member can be from any department or academic unit. The Senior Associate Dean for Graduate Education and Postdoctoral Affairs determines which member will serve as Chair for the exam.

Note:
(1) In the event that a student selects one or more co-advisor, only one advisor can act as voting committee member for qualifying and thesis exam purposes. Additional advisors may attend exam, but are not voting members.
(2) the QE committee need not be the same as the Thesis advisory committee (See section 7). Depending on the recommendations of the QE committee, Program Director or Advisor, a student may alter the composition of the committee to meet the advisory needs of the student and project going forward to completion of the thesis work.

6.2. Pre-QE Committee Meeting

In preparation for the Qualifying Examination, students are expected to complete a pre-QE committee meeting with their chosen QE committee members. The Pre-QE meeting should be scheduled at least **3 months prior to the Qualifying Examination**. The goal of the pre-QE is to ensure that students are better aware of the Qualifying Examination committee expectations, and therefore will be better prepared when taking the QE.

Students are expected to:

- Prepare a one page *Specific Aims* page of their proposal, which should be sent to committee members at least 3 days prior to the pre-QE meeting.
- Give a slide presentation during the pre-QE meeting that provides the introduction, background and hypothesis of their proposed work. This presentation need not be exhaustive, but should be sufficiently detailed to allow committee members to ask relevant questions and examine the merit and feasibility of the proposal. Overall, the pre-Q meeting should not take longer than an hour, and students should time their presentation to leave enough time for Q&A.

Faculty are encouraged to ask questions and provide constructive feedback. While the Pre-QE meeting is NOT an exam (i.e. there is no pass/fail or grade) and the student may not have all the answers ready, it is important that faculty examine whether there are fatal flaws in the proposal or major gaps in the student's knowledge. At a minimum this will allow the student to make improvements prior to the QE. If the committee finds that the proposal or the student's knowledge have significant deficiencies, making a successful completion of the QE unlikely, then the committee should make specific recommendations to the student and mentor and notify the Program Director.

The committee meeting should be documented using the standard annual evaluation form (https://www.urmc.rochester.edu/MediaLibraries/URMCMedia/education/graduate/documents/Evaluation-Annual.docx). The form should be filled out by the mentor and student after the pre-QE meeting, then circulated among committee members for comment before submitting to the Program administrator.

6.3. QE Scheduling Procedure

Students must complete the Qualifying Exam by **October 15th of their 5th semester**. **E**xceptions to the October 15 deadline, as a result of unusual circumstances, may be approved by the Senior Associate Dean for Graduate Education and Postdoctoral Affairs.

All core courses must be completed prior to scheduling the Qualifying Exam. However, in certain instances, if the 2nd elective has not been completed the exam may nevertheless be scheduled. In this case the award of the MSc degree will be held and not be conferred until the requirements are met (see Section 6.7). To prepare for this deadline, students should meet with the Graduate Studies Coordinator by the end of the 3rd semester.

Qualifying Exam Paperwork:

1. Appointment Form for PhD Qualifying Exam announces date, time, and location of the exam, the student's program, committee members and proposal title. This form is prepared by the graduate program coordinator and signed by the graduate program director. (https://www.urmc.rochester.edu/MediaLibraries/URMCMedia/education/graduate/documents/Appointment-for-the-PhD-Qualifying-Exam.docx)
2. Program of Study for the Degree Master of Science lists completed courses and grades earned that satisfy the course work requirements of the Master's degree. This form is prepared by your graduate program coordinator and signed by the graduate program director and the Senior Associate Dean for Graduate Education and Postdoctoral Affairs. (https://www.urmc.rochester.edu/MediaLibraries/URMCMedia/education/graduate/documents/Program-of-Study-Master-s-Degree.docx)
3. Proposal Title Page: Cover page with title for the thesis proposal abstract.
4. Proposal Abstract: Outline of a proposed research project that is presented to an advisory committee for approval. One page, 400 word limit, Arial 11pt font.

Time line for scheduling Qualifying exam:

At least **8 weeks** prior to exam date	Schedule Qualifying Exam date with appointed QE committee members. The student will poll the committee and advisor. Once a date/time/location has been set, students should obtain confirmation from the committee members to assure the date has been scheduled.
At least **6 weeks** prior to exam date	Inform GDSC Graduate Coordinator of planned exam date/time/location.
4 weeks prior to exam date	Submit the Title and Abstract page via email to the GDSC Graduate Coordinator, who will prepare and submit the QE paperwork to the Office for Graduate Education and Postdoctoral Affairs (GEPA) at least 10 working days prior to scheduled exam date.
2 weeks prior to exam date	Send copy of QE Thesis to the members of the Qualifying Exam Committee.
At least 1 week prior to exam	The assigned Chair of the exam committee will poll QE committee members to determine the acceptability of the thesis proposal document. If the Chair determines that each member of the committee finds the thesis proposal document to be of sufficient quality, the exam proceeds. An affirmative answer means only that committee members find that the proposal is sufficient on the whole and does not preclude changes to the document after the exam. If the thesis proposal document is determined by the committee not to be of sufficient quality, the student may be asked to make revisions and to reschedule the exam for a later date.

6.4. Qualifying Examination Research Proposal

Because a career in science will undoubtedly involve submission of research proposals for critical review (whether in an academic or industrial setting) we encourage GDSC students to engage in writing competitive proposals as early as possible. The QE provides such an opportunity, and the timing of QE coincides with the career stage at which U.S. residents typically apply for NIH fellowship grants. We therefore ask that the QE document be presented in the format required by **NIH Fellowship** proposal guidelines as described below and in the "Research Training Plan Section" of the Fellowship Instructions for NIH (Section F.340, https://grants.nih.gov/grants/how-to-apply-application-guide/forms-e/fellowship-forms-e.pdf).

Specific Aims (1 page limit):

- 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 have 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).

Research Strategy (6 page limit, single spaced)

A. Significance:

- Briefly sketch the background to the proposal and critically evaluate existing knowledge. Explain the importance of the problem or critical barrier to progress that the proposed project addresses. (Knowledge Gap)

- Explain how the proposed project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields. Describe how the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field will be changed if the proposed aims are achieved. (Innovation)

B. Approach:

- 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.
- Discuss in detail the experimental design and the procedures to be used to accomplish the specific aims of the work described in the proposal.
- Describe the protocols to be used and a tentative timetable for the investigation. Include the means by which the data will be analyzed and interpreted.
- Describe new methodology and its advantage over existing methodology.
- Describe how your methods for analysis and sample size are appropriate for your experimental plan. Include power analysis and description of statistical analysis. If appropriate, provide plans for participant assignment and intervention delivery.
- Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the aims.
- 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.

Preliminary Studies:

Include information on preliminary studies (including data collected by others in the lab) as part of the Research Strategy. Discuss your preliminary studies, data, and/or experience pertinent to this application. Preliminary data are included in the page limit of the Research Strategy section (6 pages). Preliminary data can be included as a separate section under Approach, or as part of each separate Aim.

References: Numbered format that includes all authors and the title of the article (no page limit).

General Format: Page limit applies to Arial font (11pt, single spaced) with 0.5 inch margins. Figures should be placed in-line with text with appropriate figure legends (Font Arial 9pt or greater). The committee may request larger spacing (double spaced or wider margins), but the page limit still applies for single spaced and 0.5 inch margins.

6.5. Oral Qualifying Examination

The oral QE begins with a closed meeting of the Examination Committee to review the student's academic record, research performance, and written proposal. The Committee will also decide on the general areas of questioning for the oral examination.

The student is expected to present the thesis research proposal as a formal presentation using computer slides and blackboard. The presentation should be timed to be approximately 45 minutes long. The committee will then examine the student orally. Alternatively, the committee may choose to ask question as the presentation proceeds. A typical examination will take between two and three hours. The candidate is judged on: the written and oral presentation; a grasp of the fundamental issues; the ability to apply the background from formal course work to problems related to the proposal; and a demonstration of critical assessment of results.

The Chair of the Examination Committee will moderate the examination and assure that each participant has adequate time to ask questions. The Chair is also expected to ask questions. While the focus of

questioning is usually related to the student's thesis proposal, questions aimed at assessing the student's general knowledge in Genetics are also possible and should be anticipated.

6.6. Results of the Qualifying Examination

Immediately following the oral examination, the Committee will meet in closed session to evaluate the student's overall performance (considering the oral examination, written proposal, academic record, and laboratory performance). The committee will then vote on the following outcomes:

1) Pass: student earns the Master's degree associated with the PhD degree and the student is admitted to candidacy for the PhD degree*. A three-fourths majority of the committee is required for passing the exam. All votes will be recorded.
2) Pass pending modifications: the student passes pending modifications to the thesis proposal, with 14 calendar days after the exam to make necessary revisions.
3) Fail: If the student did not pass the exam, he/she may be granted an opportunity to take a second exam. This is determined in consultation with the advisor, program director and the Senior Associate Dean for Graduate Education and Postdoctoral Affairs. The following course of action may be taken:
   a) the student may repeat the qualifying exam. It is recommended that an exam not be scheduled *earlier* than 5 months or *later* than 12 months after the first attempt;
   b) the student may be asked to leave the program. Under certain circumstances the Committee may decide that a second examination is not warranted. Such cases require a unanimous decision by the Committee. Examples of circumstances that could void a second examination include: the initial exam was scheduled after October 1st in the third year, without approval by the Associate Dean of Graduate Studies. the student has significant deficiencies in coursework (i.e., one or more "C/E" grades), performance on the initial exam was so poor that a re-examination is deemed unlikely to yield a favorable result.

*As a result of unusual circumstances, the advisory committee may determine that although the student has passed the qualifying exam, the student should not be admitted to candidacy for the doctoral degree. The student's program of study would be terminated at this point. A terminal Master's degree would be earned.

6.7. Program for the Degree of Master of Science

Upon successful completion of the Qualifying exam, and the required minimum of 30 credit hours of course work (of which no more than 6 may be credits for research), the student will be awarded a Master of Science (M.Sc.) degree.

The graduate program coordinator will complete a Program for the Degree of Master of Science form, setting forth the requirements for the student's degree. It will be filed with the office of Graduate Education & Postdoctoral Affairs at the time of registration, 15 working days prior to your Qualifying exam. This form must list all formal courses (both specifically required and electives), seminars and research credits that the student must complete in order to obtain the Master of Science degree a minimum of 30 credit hours of course work are required, of which no more than 6 may be credits of research.

7. THESIS ADVISORY COMMITTEE

Following selection of the research advisor, the student's thesis advisory committee is selected at the beginning of the second year. The thesis advisory committee performs several functions. It may help the

student choose specific elective courses in preparation for the chosen field of research. It provides advisory input during the development of the thesis research project with respect to scientific merit, techniques and methodology, relevant literature, etc. It gives final approval of the specific program presented for the thesis topic to be developed and (with exception of the advisor/advisors) participates in the Qualifying Examination. The advisory committee also mediates in case of tension between the advisor and the student. Finally, it, along with a representative appointed by the Dean's Office, is the examining committee for the thesis defense. Committee members may also provide more complete guidance in the selection of final courses in preparation for research and assist the thesis advisor. During the second year, the student in consultation and with approval of the research advisor must submit a list of suggested committee members to the Program Coordinator.

In addition to the mentor/PI, the thesis advisory committee should consist of at least four members:
1) three faculty members from the GDSC program,
2) one faculty member from outside the GDSC program. Prospective members outside the University of Rochester require Program Director approval.

Additional committee members may be included from either within or outside the University if it is considered useful or necessary. Thus, the minimum size of the committee, including the student's mentor, will be five members, but six is quite possible. In the case of joint co-advisors, a minimum of six members may be required. All members of the committee must be of the rank Assistant, Associate or full Professor.

8. ADDITIONAL PROGRAM EXPECTATIONS AND REQUIREMENTS

8.1. Fellowship Grant applications

Students are expected to apply for fellowships and grants early on in their course of research. Learning to compose competitive applications is a critical skill required for a successful career in research. Several opportunities exist for graduate students to apply for stipends, research funding and conference attendance and travel awards.

Per NIH requirements for institutional training grants, all trainees are required to obtain an Open Researcher and Contributor Identifiers (ORCID) ID. The ORCID ID is a "persistent digital identifier that distinguishes you from every other researcher and supports automated linkages between you and your professional activities, ensuring that your work is recognized." There is no fee to establish an ORCID profile and it can be linked to the one that you maintain within eRA Commons. A profile can be established via a link in Commons or by visiting the ORCID website directly: https://orcid.org/

The first major opportunity is to apply for a National Science Foundation (NSF) Graduate Research Fellowship Program (GRFP) award (www.nsfgrfp.org). GRFP Fellowships provide five years of independent stipend funding directly to the student. A wide area of STEM-related research is eligible for GRFP awards, with the exception of research with primarily disease-related goals and clinical research. This needs to be considered when preparing the application. Submission deadline is in Sept/Oct after the start of the second year.

After completion of QE, students are encouraged to apply for a Ruth Kirschstein NIH Training Fellowship (https://grants.nih.gov/grants/guide/pa-files/PA-18-671.html). In addition to providing awardees with significant funding resources, these training awards provide peer-reviewed accreditation of the applicant and a significant benefit to future career development. The process of applying for such a

fellowship also provides an invaluable training opportunity in how to prepare a research application and how to address reviewer's comments.

Due to the nature of the NIH and NSF rules, foreign nationals do not qualify for F31 and GRFP grants. These students are encouraged to seek out training grants offered by foundations and/or NY state agencies that do not impose a citizenship clause. Students can register in the GENIUS/SMARTS/SPIN databases at http://www.rochester.edu/ORPA/funding/index.html and receive funding opportunities on a daily basis. If you are interested in learning more about grants and fellowships, you may call the Office of Research and Project Administration (ORPA) for an appointment, x54031 (Hylan Building, Rm. 515 on River Campus) or you can visit them on- line at: http://www.rochester.edu/ORPA/.

8.2. Conference and Meeting Attendance

Attendance of at least one national or international conference over the course of the PhD training is required, and students must present their research in the format of a poster or oral presentation. An abstract or outline of each presentation is required for the file in the Department Office.

Throughout the year, various departments, centers, and programs sponsor poster sessions to showcase their research and to provide a forum for exchanging ideas. GDSC students who have passed their qualifying exams are expected to present their work at these sessions, and all students are expected to attend and actively participate.

8.3. Individual Development Plan

The Individual Development Plan (IDP) concept is a commonly used tool to help people define and pursue their career goals. Per the Expectations of Graduate Students, trainees will create an Individual Development Plan (IDP). In creating and developing the IDP, the trainee will work with his/her research advisor and other mentor(s) where appropriate. The IDP maps out the general path the trainee wants to take and helps match skills and strengths to career choices. Since needs and goals will evolve over time, the IDP should be revised and modified on a regular basis, no less that annually. The CPD recommends that SMD trainees use *Science* Career's myIDP tool, a unique, web-based career-planning tool tailored to meet the needs of PhD students and postdocs in the sciences.

8.4. Teaching Assistantship

Each student will be required to act as a teaching assistant in IND 431 or IND 432 for one semester. Usually, this will be during the third year, but may also take place in year 4. TA activities include small group workshop prep and moderating, pre-exam tutoring, exam proctoring and grading. However, for those students for whom English is a second language, the teaching assistantship can be delayed until the fourth year.

In addition, students are required to participate at least once GDSC-sponsored Science Outreach activities, such as the UR Pre-College Program summer course, "The Molecular Revolution: The Power of Genetics in the Stem Cell Era". This summer course is typically hosted by the Department of Biomedical Genetics in July and provides GDSC students with the opportunity to actively participate in teaching and outreach at multiple levels, including experimental design, lectures on specific topics and in-class activities. Through-out the process GDSC students will be mentored by the course director(s).

8.5. Outreach and Science Communication

To enable students to further improve communication skills, all GDSC students are expected to participate *at least once* in any of several, research and science-based competitions that take place every year. These include the Three Minute Thesis (3MT), Falling Walls and Born Seekers competitions. These opportunities are invaluable for student in their 3rd through 5th year, as they prepare to attend conferences and seek post-doctoral career opportunities. The requirement to participate in such a competition will be part of the annual review.

3MT: https://www.urmc.rochester.edu/education/graduate/professional-development/3mt.aspx
Falling Walls: https://www.falling-walls.com/
Born Seekers: http://www.bornseekersfellowship.com/fellowship.html

8.6. Peer Mentor Program

Established GDSC PhD candidates are expected to serve as Peer Mentors for new, incoming students. Peer mentors play an important role in helping the incoming students to navigate their first year in graduate school. The goal is to provide important information *from the perspective of a graduate student* for the new students. This includes giving advice about: expectations in graduate school, balancing classes and lab work, study habits, choosing a rotation and eventually a thesis lab. This mentorship helps students learn about how to read the scientific literature, improve scientific writing, and prepare for the qualifying exam. Mentorship is also intended to improve networking among the existing and new students.

The peer mentorship program provides mentors with a valuable experience in leadership, helping to build skills that will become part of the formal training experience (and as such, an activity that will be documented and listed in the CV).

Peer mentor responsibilities are:

1. Meet with the student frequently: the mentors should make themselves available to the student as much as possible, and meet at least once a month.
2. Provide advice on: Expectations in graduate school, balancing classes and lab work, study habits, choosing a rotation and thesis lab, but also residential matters, what to do in Rochester, etc.
3. Help students find the right resources: new students may not always remember all the resources they learn about during orientation.
4. Provide feedback to GDSC director as appropriate: as a fellow student mentors have a unique perspective on how a mentee is doing. Giving feedback to the GDSC directorship can be a big help in preventing problems later.

8.7. Attendance and participation in GDSC Sponsored Events

Students are expected to attend and participate in all GDSC and Department of Biomedical Genetics (BMG) sponsored events. This includes:

- Scientific events (e.g. Thesis defense by GDSC students, Second Friday Science Social, Genetics Day, Wilmot Cancer Institute Symposium, invited speaker presentations),
- GDSC Recruitment Events (e.g. chaperone applicants, poster session, student activity night)
- GDSC Social events (e.g. Fall Retreat, Spring Fling, Wilmot Warrior Run).

Participation in these events is important for both the growth of the individual student, as well as the program itself. Attendance may be taken and the program coordinator should be notified if a student is unable to attend.

9. GUIDELINES FOR THE PREPARATION AND REGISTRATION OF THE PH.D. THESIS

9.1. Requirements

- Qualifying exam has been passed no sooner than six months prior to the thesis defense.
- Completion of degree requirements within specific time limits (7 years unless extension granted by Senior Associate Dean for Graduate Education).
- Satisfactory completion of the appropriate number of credit hours for the program (90 credit hours with no grades outstanding excluding current term).
- *Program of Study* must be on file with all requirements met. Note that the *Program of Study* should be filed before student completes the Thesis Proposal exam and will be used as a guideline for completion of his/her degree work. It reflects the minimum courses/credits needed to complete the degree.
- Student must have maintained continuous enrollment since admittance into the Graduate Degree Program.
- All students are required to be the primary author on a peer-reviewed journal article submitted for publication prior to defending their PhD research.
- Committee must conform to the guidelines set by the Vice Provost for Research and Graduate Affairs Office. The Committee consists of four people including the advisor and an outside member. The outside committee member is defined as a tenure-track faculty member who is from **outside** of the GDSC program and Department of Biomedical Genetics. A person from outside the University may serve as the outside member with prior approval from the Senior Associate Dean for Graduate Education and the Vice Provost and University Dean for Graduate Studies. Refer to the University's Official Bulletin for Graduate Studies for more details.

9.2. Written thesis

A manual entitled "The Preparation of Doctoral Theses" is available online at **http://www.rochester.edu/Theses/** . It is the responsibility of the student to see that style, format, margins, paper, binding, etc. are in accordance with University regulations. If you have questions or concerns regarding the thesis preparation, please contact the Office of the University Dean for Graduate Studies, x54279. The thesis should consist of the following:

- Title Page (formatted as the example in the Graduate Thesis Manual)
- Curriculum Vitae
- Acknowledgments (where relevant)
- Abstract
- Table of Contents
- List of Tables (if applicable)
- List of Figures and/or Plates (if applicable); note figures may be placed in -line with the written text and need not be placed at the end of a chapter as was previously done.
- Foreword
- Text of the Thesis
- Conclusion
- Bibliography
- Appendices

The University Dean of Graduate Studies has set deadlines during the academic year by which a thesis must be registered in order to participate in graduation at the next Commencement. Please refer to the School of Medicine and Dentistry Graduate Student Academic Calendar for dates regarding registering the thesis, holding the defense and submitting corrected copies. **These dates must be adhered to; there are no exceptions**. Calendars are available online at:
https://www.urmc.rochester.edu/education/graduate/current-students/academic-calendar.aspx
Note: Defenses will not be scheduled after 3:30 P.M.

9.3. Overview of Due Dates

- **At least 6 months prior** to scheduling a defense: Meet with the Advisory Committee to request approval to begin writing thesis.
- **At least 4 months** to scheduling a defense: The program director, with input from you and your advisor, will identify **3 individuals** to serve as a Chair for your defense. Please fill out the Request for PhD Defense Chairperson and submit it to the program director along with a title page and abstract.
- **At least 6 weeks prior** to the date of defense: Notify graduate program coordinator of defense plans. Provide the names of your committee members, title, and abstract of your dissertation. The coordinator will prepare the necessary forms for thesis registration (Biomedical Science Program of Study, Program Statement on Completion of PhD Requirements) and will start a record in the PhD Defense Processing System in a SharePoint website. The system allows student's personal information, all necessary forms, and the required approvals to be collected electronically at various points through the process prior to defense.
- **At least 4 weeks prior** to the defense: Upload your PhD thesis and CV in pdf format to the PhD Defense Processing System, and complete the Alumni Update Form for your exit interview. Please ask your committee whether they prefer paper or/and electronic version of the thesis. The committee members have 2 weeks to review your dissertation. Please note that URMC Copy Center requires 4 business days to print and bind your thesis.
- **At least 10 full working days prior** to the date of defense: At this point provide the Chair of the committee with a copy of your thesis (paper and/or electronic). The coordinator approves your record in PhD Defense Processing System which triggers the emails to the committee members asking for their approval. After committee approval, the GDSC Program Director approves your defense. Next the Senior Associate Dean of the School and the University Dean review and approve your thesis online in the PhD Defense Processing System. Students will receive notification from the University Dean's Office confirming scheduling of the defense and the appointment of the Chair. The Chair of the defense and the committee will receive exam information from the University Dean via email.

NOTE: More detailed information on registering and finalizing the thesis is available at
https://www.urmc.rochester.edu/education/graduate/trainee-handbook/academic-resources/thesis-defense.aspx

10. FINAL EXAMINATION

10.1. Defense

Before the exam, the student's advisor will receive confirmation of the scheduling of the exam and name of the Chairperson of the Examining Committee appointed as the representative of the Dean of Graduate Studies.

The format of the Final Examination for the Ph.D. is as follows. A formal seminar open to the public is presented by the student during the first hour of the exam. The student's presentation should last approximately 50 minutes and 10 minutes are allowed at the conclusion for questions from the audience. Notes, slides, charts, and the usual visual aids for a seminar are permitted. The student and the Examining Committee will then adjourn to a private session where the second part of the exam will be conducted. Using oral examination, the committee will scrutinize the student's comprehension, execution, description and interpretation of the research described in the thesis.

10.2. After the defense

After the Defense, the Committee Chair notifies the Dean of Graduate Studies of the outcome of the defense. If the outcome is a pass, the student will receive an email with further instructions from the University Graduate Studies.

After the successful completion of both the public and closed exams, the student needs to complete **revisions to the written thesis** (if necessary) and submit them to faculty for approval. The Dean's Office receives the final approval from the faculty via email.

Publication of Thesis
The student uploads the final document to the UR ProQuest site **before the degree period deadline**. It is student's responsibility to be aware of the deadline for the current degree period and submit all required forms and documentation on time. Deadlines are listed on the academic calendar. It is strongly recommended that a student begin working on their ProQuest form before their defense to familiarize themselves with the site and learn what they have to do to complete the form. The form can be started, continued and/or amended.

If there is proprietary or confidential information in your dissertation, such as industry trade secrets or studies using a reagent obtained under the Material Transfer Agreement (MTA) with restrictions on publishing, the information should be removed from the dissertation, placed in an appendix that will be restricted from public view, and provided to the UR Graduate Studies Office on a CD or flash drive. Text should be in PDF format.

Some publishers may consider worldwide access to your dissertation on UR Research to be prior publication of the work. If your dissertation includes chapters or data that you plan to publish in the future, you should opt to **restrict access to the University of Rochester community only**, which this form permits for up to 2 years after the date your degree is awarded by the Trustees. Extensions of the UR- only restriction in order to delay worldwide access are permitted in some circumstances on request to the University Dean of Graduate Studies.

The option of a **complete embargo** (blocking access to anyone, including those within UR) is limited to 3 months. Use this option if your dissertation contains new information that could lead to an invention. It will be completely embargoed for a 3-month period after the date your degree is awarded by the Trustees, during which an Invention Disclosure Form may be submitted to the Office of Technology Transfer and patent protection obtained for the invention.

Exit Survey
To exit the program student will need to complete a two-part web-based survey. The first part of the survey contains a brief set of questions from the University of Rochester. When the first part is completed, the student will be automatically directed to the second part where questions about activities in the program, future plans and honest opinion on the quality of the PhD program will be asked. The

responses are completely confidential, but the student ID number is requested to verify the survey has been completed.

University Graduate Studies monitors the completion of the post-defense requirements and updates the student's record accordingly. Once they have all been met, and the final version of the student's PhD thesis was sent to ProQuest, the site will generate the final completion memo, a copy of which is sent to the graduate coordinator, the student, the dean's staff, International Services Office and University Housing. The Graduate Program Coordinator will prepare forms (Change of Status and 506 Appointment Forms) to terminate graduate student status.

The PhD stipend is to be terminated at the end of the pay period in which the student submits the final copy of the dissertation. SMD policy requires that students turn in the final copy of the dissertation within 30 days of the final oral examination. In extremely rare circumstances, the student may be unable to turn in the final dissertation within 30 days of the oral examination. In such cases, continuation of the stipend beyond the end of the pay period in which the 30th day falls is at the discretion of the advisor and the Senior Associate Dean for Graduate Education.

11. HEALTH INSURANCE FOR GRADUATING STUDENTS

Graduating students are encouraged to check their health insurance status **at least 60 days in advance** of graduation to assure continuing coverage and access to health care following graduation. For information about coverage options after graduation, please visit: http://www.rochester.edu/uhs/primary-care/mandatory-health-fee/health-insurance-for-full-time-students/insurance-and-health-information-for-graduating-students/ .

12. M.D./Ph.D. PROGRAM

M.D./ Ph.D. program students usually enter the Ph.D. portion of their combined degree work after the basic science years of the M.D. curriculum. During the second year of the M.D. program, they should discuss the Ph.D. Program with prospective faculty advisors and the GDSC Program Director. It is optimal for the student to complete two research rotations before choosing a permanent advisor.

A total of 96 credit hours are required for the Ph.D., M.D./ Ph.D. Program course requirements are meant to be sufficiently flexible to accommodate students with diverse backgrounds and career goals.

12.1. Curriculum

Year 1 Fall Semester *(16 Credits)*

Course Number	Title
IND 431 (5 Credits)	Foundations in Modern Biology I
IND 501 (1 Credit)	Ethics & Professional Integrity
GEN 503 (1 Credit)	Genetics Seminar*
GEN 507 (4 Credits)	Advanced Genetics & Genomics
GEN 595 (9 Credits)	Ph.D. Research Rotation**

Year 1 Spring Semester ***(16 Credits)***

Course number	Title
IND 432 (5 Credits)	Foundations in Modern Biology II
IND 419 (3 Credits)	Intro to Quantitative Biology
GEN 504 (1 Credit)	Genetics Seminar*
GEN 595 (4 Credits)	Ph.D. Research Rotation**

Year 2 Fall Semester ***(total 16 Credits)***

Course Number	Title
GEN 503 (1 Credit)	Genetics Seminar*
GEN 595	Ph.D. Research**
Electives	

Year 2 Spring Semester ***(total 16 Credits)***

Course number	Title
GEN 504 (1 Credit)	Genetics Seminar*
GEN 595	Ph.D. Research**
Electives	

* Required each semester throughout the course of study and includes yearly presentations beginning at the end of year 2

** The number of credits given for GEN 595 varies depending on if an elective is taken and how many credits is given for the elective. A total of 16 credits in the fall and spring semesters must be maintained.

12.2. Electives

One elective is required. Elective courses selected by the student should reflect the specific interests of the individual student and the requirements for specific degree-granting program that the student is interested in. A wide variety of courses are available for consideration and the student should consult with the Program Director, Ph.D. research advisor and course directors regarding the suitability and prerequisites of any given course. It should be noted that course offerings change constantly and the student should consult the course catalogue (https://cdcs.ur.rochester.edu/).

Fall Semester

Course Number	**Title**
GEN 508 (4 Credits)	Genomics and Systems Biology
PTH 507 (3 Credits)	Cancer Biology
BIO 426 (4 Credits)	Developmental Biology
NSC 512 (5 Credits)	Cellular Neuroscience
IND 426 (2 Credits)	Science Communication
MBI 406 (3 Credits)	Biomanufacturing
MBI 473 (3 Credits)	Immunology

Spring Semester

Course Number	**Title**
GEN 506 (4 Credits)	Stem Cell Biology (alt years-even)
BST 467 (3 Credits)	Applied Statistics in the Biomedical Sciences (R)
IND 443 (4 Credits)	Eukaryotic Gene Organization & Expression I
IND 447 (4 Credits)	Signal Transduction
NSC 525 (3 Credits)	Biology of Neurological Disease
IND 439 (2 Credits)	Leadership and Management for Scientists

MBI 421 (3 Credits)	Microbial Genetics and Physiology
MBI 456 (4 Credits)	General Virology
BCH 412 (5 Credits)	Advanced Topics in Biological Macromolecules

12.3. Other Requirements

- Two research rotations should be conducted prior to joining a laboratory for dissertation research. Students are encouraged to complete these rotations during the first two years of the M.D. program.
- The Qualifying Examination is required at the end of the second year of the Ph.D. studies.
- The teaching assistant requirement is waived.
- At least one meeting per year with the thesis advisory committee (normally held after the student's Genetics Seminar presentation).
- A satisfactory thesis must be written and successfully defended.

13. GENERAL POLICIES

This handbook was prepared to supplement but **not** replace the Official Bulletin of Graduate Studies, which super cedes program specific rules and should be reviewed by all students https://www.urmc.rochester.edu/education/graduate/trainee-handbook/policies-benefits.aspx#GraduateStudents).

13.1. Student Support Resources

The success of our program is measured by the success of our students. Providing trainee support is key to ensuring that our students achieve their full potential. Students who feel they are not achieving this potential are encouraged to seek help as soon as possible. Several resources are available to our students in addition to academic writing support, including tutoring support for course work, mental health counseling, peer support and career services. Contacts and information can be found on the Office for Graduate Education and Postdoctoral Affairs web site at:
https://www.urmc.rochester.edu/education/graduate/trainee-handbook/trainee-support-resources.aspx

13.2. Fostering a Professional and Respectful Learning Environment

URMC expects and requires learners, faculty, and staff to conduct themselves in a professional and respectful manner.

This expectation is summarized in the acronym *iCARE,* which stands for:

INCLUSION:
I will embrace diversity, be an ally for others, and acknowledge that everyone has their own story.

- Be welcoming – invite everyone to be involved
- Address my own biases and behaviors – take responsibility for my actions
- Ask – don't make assumptions about others

INTEGRITY:
I will be honest, ethical, and act in a fair and trustworthy manner.

- Be mindful of my actions – in my conversation topic, tone, volume, and body language
- Uphold professional and ethical standards – adhere to all regulations that apply to me
- Take pride in my work – both in quality and rigor

COMPASSION:
I will act with kindness, show empathy, and be responsive to individual needs.

- Communicate with kindness – use preferred names, smile, make eye contact, actively listen
- Be mindful and sensitive to others' feelings – act with empathy
- Value all team members and their roles – introduce new members

ACCOUNTABILITY:
I will lead by example, take responsibility for my actions, and support the efforts of my team.

- Introduce myself – greet others, say my name, and explain my role
- Answer questions clearly – ask about and address concerns, explain, involve, and update
- Take ownership of problems – work collaboratively with others to resolve

RESPECT:
I will be open and accepting of others' perspectives, and treat each person with dignity and cultural sensitivity.

- Treat all individuals fairly and equitably - regardless of personal identity
- Be courteous and friendly – to all colleagues, learners, patients, families, and visitors
- Speak positively – about colleagues, learners, departments, and the institution

EXCELLENCE:
I will advance personal and team goals, seek innovative approaches, be Ever Better – Meliora.

- Accomplish tasks and fulfill responsibilities –work to the best of my abilities and expertise
- Take initiative to help – offer assistance and support, and ask if there is anything else I can do
- Recognize my colleagues – thank them for their efforts both publicly and privately

Inappropriate behavior that negatively impacts our learning environment is prohibited. Inappropriate behavior includes but is not limited to: sexual harassment; any discrimination or harassment based on age, color, disability, domestic violence status, ethnicity, gender identity or expression, genetic information, marital status, military/veteran status, national origin, race, religion/creed, sex, sexual orientation, or any other status protected by law; humiliation; verbal, psychological or physical punishment; and/or the use of grading and other forms of assessment in a punitive manner.

All concerns or complaints regarding inappropriate behavior, either witnessed or experienced, should be reported. Specific procedures and contact information can be found at: https://www.urmc.rochester.edu/education/graduate/trainee-handbook/trainee-support-resources.aspx and https://sites.mc.rochester.edu/media/1924190/urmc-18_pr_conduct_full_pub_r6.pdf. All individuals who file a report will be advised about the follow-up and outcome of any reported incident.

13.3. Dealing with Problems and Grievances

While graduate studies are exciting and intellectually stimulating times in a trainee's career, occasionally problems can arise. There are many people to whom students can turn for advice and help when facing problems. This includes faculty advisor(s), thesis committee members, the graduate program director, the department chair and the Senior Associate Dean for Graduate Education and Postdoctoral Affairs. And students are encouraged to seek help and advice as soon as possible to resolve problems, including scientific and personal disagreements.

A grievance may be considered if the student has evidence that criteria have not been applied consistently. The informal procedure consists of discussing the problem or concern with the relevant faculty member. If the student is not satisfied with the outcome of the discussion with the relevant faculty member, the student should:

1. Alert the advisor of the problem or concern, unless the problem is with the advisor.
2. Alert the program director of the problem or concern, unless the problem is with the program director.

3. Alert the department chair of the problem or concern, unless the problem is with the Department Chair.

If the student is still not satisfied with the outcome of the discussion, the student should contact the Senior Associate Dean for Graduate Education and Postdoctoral Affairs within 10 days of receiving the faculty member's response (advisor, program director or chair). All materials and communications from previous contacts in the procedure should be assembled by the student and forwarded to the SAD-GEPA with a cover letter. The cover letter should contain information which describes why the results of the previous steps in this procedure were objectionable and/or unsatisfactory and a statement which explains how the student feels this problem can be solved. The SAD-GEPA has three options:

1. To rule that the problem is not grounds for a grievance; this ends the grievance.
2. To rule on the problem.
3. To refer the problem to an ad hoc committee appointed by the SAD-GEPA, comprised of three individuals who have not been involved in the procedure thus far. The committee will review all materials and refer their written evaluation to the SAD-GEPA who will act on the recommendations.

If the student is still dissatisfied with the outcome, the final step in this procedure is to assemble the materials as outlined in the previous step within 10 working days, attach a cover letter (see above) and forward these materials to the Dean of the SMD. The Dean will rule that the problem is not grounds for a grievance or rule on the problem.

SMD Ombudsperson

In addition, students can also turn to the Ombudsperson. The current names and contact information of these ombudspersons can be found at: https://www.urmc.rochester.edu/education/post-doctoral/ombudspersons.aspx

Each of these ombudspersons is a faculty member who can provide **confidential, neutral, independent,** and **informal** advice to help trainees address their concerns. Discussions with the Ombudspersons can be through phone or in-person.

The Ombudspersons provide a resource for and information about institutional policies, act as facilitators to help trainees resolve their problems and connecting trainees with those who can help, accompany the trainee in discussions of problems or issues with faculty or administrators, and act as an informal mediator between the trainee and faculty or administrators. The Ombudspersons can also help to effect positive change by providing feedback on patterns of problems and complaints to appropriate administrators.

Discussions with the Ombudsperson will normally operate under a rule of confidentiality. It should be understood, however, that if a problem disclosed to the Ombudsperson involves a violation of law or University policy, the Ombudsperson may be required to disclose the problem to the Senior Associate Dean for Graduate Education and Postdoctoral Affairs and the Office of Counsel. The Ombudsperson considers the interests and concerns of all parties to disputes, with the goal of achieving appropriate and fair outcomes. The Ombudsperson does not participate in any formal grievance process. The Ombudsperson is independent of the academic administration and only reports on patterns of problems to administrative officers in order to effect positive change for trainees. The Ombudsperson helps to identify formal and informal avenues for resolving conflicts, and works with trainees to determine the appropriate response for their situation. If a trainee is not comfortable taking their concerns to any of the people noted above, they may also contact the University Intercessor (https://www.rochester.edu/intercessor/).

13.4. Academic and Scientific Misconduct

Honesty is the cornerstone of academic integrity and scientific inquiry, and suspected infractions will be treated with utmost seriousness. Academic misconduct includes cheating on exams and assignments, plagiarism, or providing false information. Scientific misconduct includes a deliberate attempt to alter existing data, creating data that did not exist, or knowingly misrepresenting data to support an idea or to perform additional experiments. Scientific fraud also includes deliberately denying the existence of an experiment because the results of the experiment did not meet expectations, confirms the hypothesis, or were inconsistent with previous results. Plagiarism is also a form of scientific misconduct.

Any concerns regarding possible academic misconduct that should be brought to the attention of the Program Director. In consultation with the Assistant Director, the Chair for the Department for Biomedical Genetics and the Senior Associate Dean for Graduate Studies, the Program Director will conduct an investigation, and make specific recommendations to the Dean of Graduate Studies. For additional University guidelines regarding academic misconduct please refer to the University of Rochester's "Policy on Research Misconduct".
(http://www.rochester.edu/orpa/_assets/pdf/compl_miscon3.pdf)

Consequences may include the loss of research assistantship and/or employment with the university. Depending on the findings, it may also be necessary to notify state and federal agencies, which may need to conduct further review of the case. Any publications that include fabricated data will be corrected by notifying the journal editors. If work was conducted on a government grant, the governmental agency funding the study will be notified. This may restrict or prevent future employment on any government-funded research project.

13.5. Data Management, Access and Accountability

As with all research materials and results generated under the auspices of, and with resources provided by the University of Rochester, all data also remain property of the University (as further outlined in the University of Rochester Intellectual Property Policy; http://www.rochester.edu/ventures/for-ur-innovators/for-inventors-university-policy-on-intellectual-property-and-technology-transfer/). Therefore, students are responsible for the safe and accessible storage of data generated in the course of their research work. Proper storage includes: (1) the use of secure, redundant storage systems to prevent inadvertent data loss (i.e. University of Rochester Box cloud storage) and (2) the clear and accessible cataloging of data to allow ready access to the data by authorized third parties, including but not limited to the principal investigator. This applies to both published and unpublished data.

13.6. Space

The Department of Biomedical Genetics provides dedicated office space with swipe-card access for GDSC first-year students. Once a research advisor has been chosen, the student will usually be given a desk in the advisor's laboratory.

13.7. University-based training

Students are responsible for obtaining and maintaining compliance with all required training as is necessary for their work in laboratory settings. Such training includes, but is not limited to, lab safety, HIPAA, and UCAR protocols and procedures.

13.8. Work hours

Daily attendance in the laboratory is required unless a student is in class or attending an on-campus event. The following also qualify as excused absence: off-site research conference, illness, illness in the family.

Students should discuss expectations regarding work hours and attendance with the faculty member who runs the lab they are in. Scientific research often requires work days that are longer than the traditional 8-hour workday. Sometimes work will need to be performed on Saturdays and Sundays to initiate or complete research projects. Unexplained absences of a continuous nature may result in loss of laboratory privileges, reduction to or loss of financial support, or a failing grade on research credits (which would result in expulsion from the program).

13.9. Vacation policy

Each student is allowed 10 business days of vacation per year as mandated by NIH, plus University holidays. University holidays include Christmas Day, New Year's Day, Memorial Day, the 4th of July, Labor Day, and 2 days at Thanksgiving. While the scheduling of vacations is left to the discretion of the student**, prior approval from the advisor must be obtained** so as not to conflict with coursework, laboratory experiments and other duties. Before scheduling an extended absence from the University (i.e., more than 10 business days), students must obtain permission from their thesis advisor and the GDSC Director. **Students will not receive stipends if absent without authorization.**

It is important that all **international students** inform the GDSC Coordinator of their international travel (including Canada) at least 10 days in advance, as there are specific documents from the University that are needed in order to ensure successful re-entry into the United States. Travel within the U.S. does not require documentation. International students should refer to the University's *Travel Information and Documentation website* (http://www.iso.rochester.edu/travel/index.html) before traveling within the U.S. or abroad.

13.10. Parental leave

The University of Rochester School of Medicine and Dentistry (SMD) provides accommodation for its graduate students for the birth or adoption of children, as outlined in this policy. Graduate students are provided up to 8 weeks of leave following the birth or the adoption of a child. During this period, students may postpone course assignments, examinations, and other academic requirements but remain active full-time students, with access to university facilities (including student health insurance, library privileges, and housing) and to university faculty and staff.

While students will continue to be fully funded off any existing funding sources (e.g., fellowship, assistantship) during the leave period, students will be excused from regular teaching or research duties. However, it is the student's professional responsibility to work with their advisor or faculty member to prepare for the absence in advance of the leave. This includes reviewing the status and continuation of research projects, adequately preparing those who will assume teaching responsibilities during the student's absence, and arranging for a smooth transition in any other responsibilities.

Eligible graduate students are required to notify their Advisor and school Dean of Graduate Studies of the date of their intended time away at least 60 days prior (when possible) to the expected date of childbirth or adoption, using the Parental Leave Request Form. While applications for parental leave are required, the benefit is automatic. Please contact the SMD Registrar to discuss how Parental Leave may affect your credit hour status. For those on NIH training grants, the use of parental leave must be approved by the Training Grant PD/PI. If extended time is needed beyond the 8 weeks leave, written approval for an unpaid Leave of Absence must be requested, and approval obtained from the student's Advisor, Program Director, and the school's Dean of Graduate Studies. Note that individual fellowships, such as the NSF Graduate Fellowships, may require sponsor approval for extended leaves of absence. Specific guidelines should be consulted. For additional information for services and support, such as Child Care options, Family Health Insurance, available Lactation Rooms and Family Counseling, please visit:

https://www.urmc.rochester.edu/education/graduate/trainee-handbook/policies-benefits/family-friendly-policies.aspx

13.11. Inclement weather notifications

Situation	Email Communication to Trainees and Faculty
- Monroe County has issued a travel advisory - The University remains open	Dear students and postdocs, Please be advised that Monroe County has issued a travel advisory although the University remains open. Students and postdocs should monitor course and program communication channels for the status of those activities. Students and postdocs should attend courses or travel to the University for research or other program-based activities at their own discretion. Students engaged in clinical activities must follow any URMC requirements related to direct and indirect patient care. Your safety and well-being is our primary concern. Sincerely, Senior Associate Dean for Graduate Education and Postdoctoral Affairs
- Monroe County has issued a travel ban - The University remains open	Dear students and postdocs, Please be advised that Monroe County has issued a travel ban although the University remains open. Students and postdocs should not attend courses or travel to the University for non-essential research or other program-based activities Students and postdocs should maintain open lines of communication re: essential research activities with the appropriate parties. Students and postdocs must consult with program/department leadership and/or individual PIs/research advisors for clarity regarding which research activities are essential. Students engaged in clinical activities must follow any URMC requirements related to direct and indirect patient care. Your safety and well-being is our primary concern. Sincerely, Senior Associate Dean for Graduate Education and Postdoctoral Affairs
- The University closes	Dear students and postdocs, Please be advised that the University has closed due to inclement weather. All courses and non-essential research activities are cancelled. Students and postdocs should maintain open lines of communication re: essential research activities with the appropriate parties. Students and postdocs must consult with program/department leadership and/or

Situation	Email Communication to Trainees and Faculty
	individual PIs/research advisors for clarity regarding which research activities are essential. Students engaged in clinical activities must follow any URMC requirements related to direct and indirect patient care. Your safety and well-being is our primary concern. Sincerely, Senior Associate Dean for Graduate Education and Postdoctoral Affairs

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This copy of the GDSC Handbook was designed to be in line with current policies and regulations of the University of Rochester. As a result, this Handbook contains content from UR GEPA and Graduate Program resources.