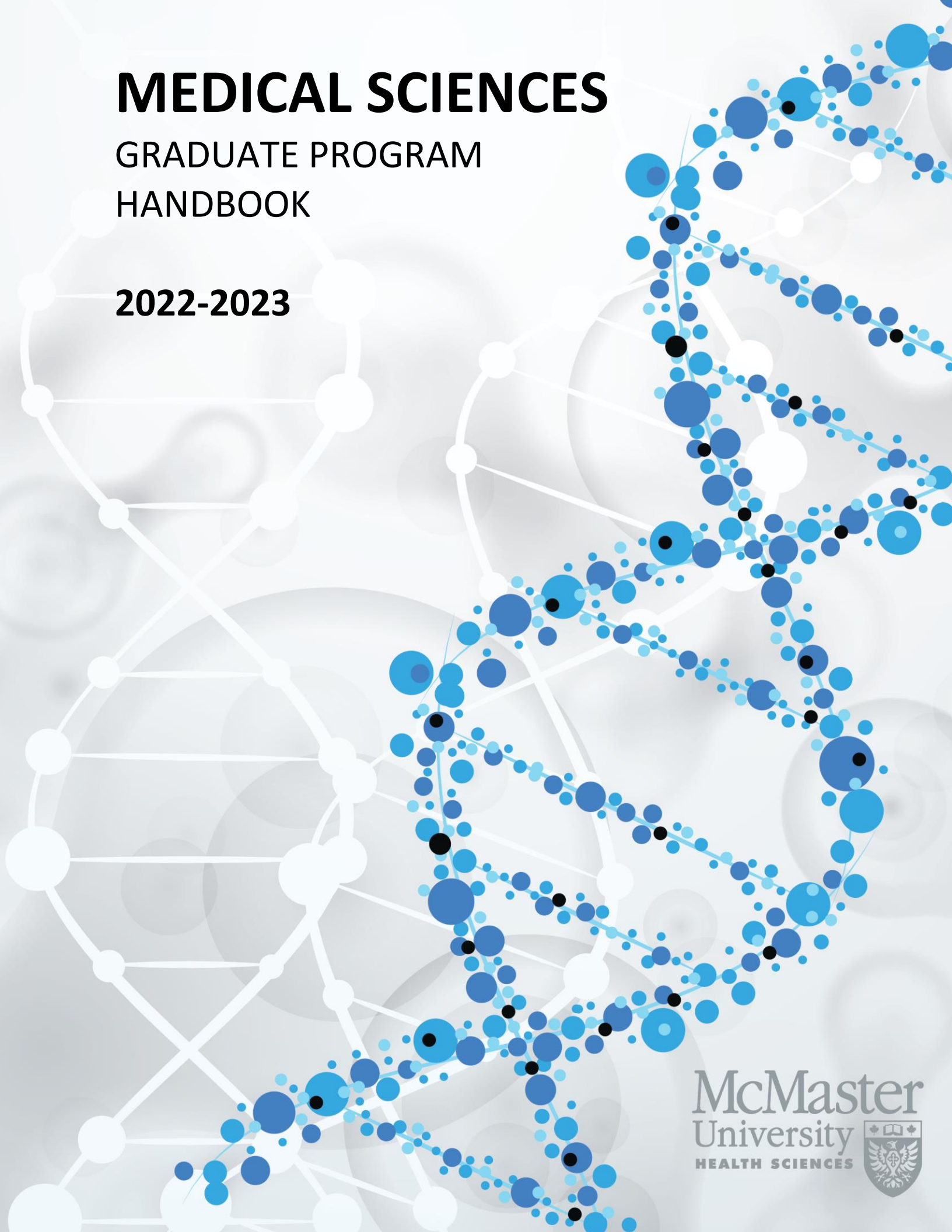
# MEDICAL SCIENCES

## GRADUATE PROGRAM HANDBOOK

**2022-2023**



McMaster University
HEALTH SCIENCES

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# Welcome from the Assistant Dean of Medical Sciences

McMaster University has a long-standing reputation as Canada's most innovative university and the 'Medical Sciences' program has been its flagship graduate program for over 40 years. The main strength of our program is our research faculty, whose laboratories are carrying out cutting-edge research in multiple health-related areas, including cancer, infection and immunity, cardiovascular disease, genetic disorders, metabolism and nutrition, physiology and pharmacology and epidemiology. McMaster also offers a unique interaction between basic scientists and clinical faculty that fosters opportunities for translational research. In addition to being leaders in their fields of research, our faculty members are also trained to provide students with high quality supervision. Our students are further supported by an excellent group of administrators and administrative staff, along with an established committee for each graduate student, offering individual attention. Our goal is to provide our graduate students with high-level training in technical research skills, further complemented by extensive development in communication and critical thinking skills. Additional opportunities in career development and training are also available to our students. Together, this training will prepare our students for making significant contributions in health and non-health related fields within academia, industry, government, and business. Finally, the city of Hamilton, where McMaster University is situated, is a great place to work and play with vibrant entertainment and extensive green space. Hamilton has also been ranked as a 'Top North American City' by FDI Magazine for its quality of life.

To summarize, graduate studies in Medical Sciences offers students unlimited opportunities for innovation and discovery in research, encourages intellectual and social interaction among students and faculty and provides the skills necessary for positioning candidates favourably for current and emerging job markets. Please take the opportunity to explore our website and learn more about McMaster's Medical Sciences Graduate Program.

# Medical Sciences Program Vision

***This document is not intended to replicate or modify the information contained in the School of Graduate Studies (SGS) Calendar available at https://academiccalendars.romcmaster.ca/index.php?catoid=45***

This purpose of this handbook is to outline the policies and procedures followed by the Medical Sciences Graduate Program, which supplement the policies and procedures contained in the SGS Graduate Calendar. Students and Faculty are encouraged to review the general and program specific sections of SGS Calendar for information about:

- Graduate studies at McMaster University
- General regulations of the School of Graduate Studies
- University policy, regulations, and governing bodies
- Graduate fees and financial assistance
- University services
- Scholarships, fellowships, bursaries and other awards
- Student appeals
- Degree program requirements
- The Medical Sciences Graduate Program

For further information on the topics covered by this handbook, students are advised to consult the staff in the Medical Sciences office (HSC-4H4), or email medsci@mcmaster.ca.

Students should consult the Graduate Calendar for sessional dates and other relevant information. Students are expected to follow University policies on both academic and research integrity and should be familiar with Sections 5.1 and 5.2. Academic Integrity and Code of Conduct of the School of Graduate Studies Calendar. Students are expected to read these policies and be familiar with them within the first month of enrolment in the program. In addition, all students are expected to keep a personal copy of their primary research records, analyzed data, figures, manuscripts and other documents to ensure their integrity.

# Administrative Organization of the Program

### ACTING ASSISTANT DEAN OF MEDICAL SCIENCES

Dr. Sandeep Raha ext. 76213, email rahas@mcmaster.ca

### PROGRAM FIELDS AND AREA COORDINATORS

Each of the five broad fields of research in the Program; Cancer/Genetics (CG), Blood/Vasculature (BV), Infection/Immunity (II), Metabolism/Nutrition (MN), and Physiology/Pharmacology (PP) is headed by an Area Coordinator. The primary role of the Area Coordinators is to provide students with additional guidance for development of their Education Plan, Supervisory Committee meetings and reports, and to assist in conflict resolution, if needed. The Area Coordinators work closely with the Assistant Dean of Medical Sciences and the Administrative Staff to ensure that all aspects of the Graduate Program run efficiently and according to the policies and procedures of McMaster University's School of Graduate Studies.

Blood & Vasculature Area (BV) - Patricia Liaw, ext. 40788, email: patricia.liaw@taari.ca
Cancer & Genetics Area (CG) – Roma Sehmi ext. 22963 email: sehmir@mcmaster.ca
Infection & Immunity Area (II) - Ali Ashkar, ext. 22311, email: ashkara@mcmaster.ca
Metabolism & Nutrition Area (MN) - Thomas Hawke, ext. 22372, email: hawke@mcmaster.ca
Physiology and Pharmacology Area (PP) - Alison Holloway, ext. 22130, email: hollow@mcmaster.ca

### PROGRAM STAFF (located in HSC-4H4)

George Bijelic, Manager, ext. 22735 - email: gbijel@mcmaster.ca
Daphne Kilgour, Graduate Officer, ext. 27458 - email: kilgoud@mcmaster.ca
Admissions Questions : msadmit@mcmaster.ca
All other inquiries: medsci@mcmaster.ca

## Admission to the Program

The Program welcomes candidates who show high scholarly promise and hold undergraduate degrees in the biological sciences including but not limited to Biology, Biochemistry, Medicine, Microbiology, Molecular Biology, Health Sciences, Pharmacology or Physiology. See our website for detailed information at http://fhs.mcmaster.ca/medsci/prospective_students.html

MD/PhD Program

Medical Sciences is one of 7 participating graduate programs within the MD/PhD program. Students interested in this program should consult the MD/PhD Program Admissions requirements at https://healthsci.mcmaster.ca/mdphd/education/future-students

Clinician Investigator Program

The McMaster University Postgraduate Medical Education Program offers a Clinician Investigator Program for physicians to pursue research training as part of their education, with completion of either a Master's or Doctoral degree. Interested individuals, who wish to complete a degree in Medical Sciences as part of Clinician Investigator training should contact the Medical Sciences Program and also the Director of the Clinician Investigator Program.

Clinician Investigator Program Director:

Dr. Zena Samaan, MBChB, MRCPsych,
Associate Professor, Psychiatry, McMaster University
Mood Disorders Research Unit
100 West 5th Street, Hamilton, ON L8N 3K7
Tel: 905-522-1155, ext. 36372
Fax: 905-575-6029
Email: samaanz@mcmaster.ca

## Financial Support of Students

Stipend: A minimum stipend for in-time, full time students in the program is approved each year by the Medical Sciences Program. The 2022-2023 regular support is $21,000/year for MSc and $24,000/year for PhD students. The stipend is comprised from several sources but typically includes a research scholarship from the supervisor, a graduate scholarship provided by the program and/or employment income from a Teaching Assistantship (TA) or Research Assistantship in lieu of TA (RA in lieu). Students are guaranteed the minimum level of support as outlined in their letter of offer for either 2 years at the MSc or 4 years for PhD level. Students are encouraged to finish their degrees on time as MSc students who enter overtime status (in third year) and PhD students who enter overtime (fifth year) are not guaranteed funding. Amounts provided from the various components may be adjusted for students who hold external or internal scholarships.

**Important note**: The level of graduate scholarship support decreases with the level of funding provided by external awards. For information of the composition of their individual funding, students should contact the Medical Sciences Program Office. Details about graduate payments is available from the School of Graduate Studies on the School of Graduate Studies website at https://gs.mcmaster.ca/current-students/fees-and-payment/

Students are encouraged to seek external funding opportunities as success in these competitions is important for their CV. Scholarship information can be found https://gs.mcmaster.ca/current-students/scholarships/ . Important information about the distribution of graduate payments is available from the School of Graduate Studies on the School of Graduate Studies website at https://gs.mcmaster.ca/current-students/fees-and-payment/

It is the students' responsibility to contact their supervisor a couple of months before their funding ends to discuss the possibility of further support. If the supervisor is willing to continue to financially support his/her students that will be overtime or out-of-time, the supervisor must inform the Medical Sciences program staff as soon as possible.

In some circumstances, the student may be asked to repay all or a portion of their funding (i.e., overpayment, degree completion prior to final month in program). It is the responsibility of the student to ensure he/she budgets their finances appropriately and is prepared in the event of a repayment. Each situation is unique, and you will be contacted by the program office or the School of Graduate Studies to arrange repayment.

### Teaching Assistantships

Each year, the Program receives an allocation of Teaching Assistantships (TAs) to help support our students. These TA positions not only provide financial support but also provide an excellent teaching experience for students. The number of positions available usually falls short of demand. Presently only domestic PhD students are provided a TA guarantee in their offers of admission however many of our MSc students also obtain TA opportunities. MSc and PhD students can receive a maximum of two years and four years of TA guarantees, respectively. TA awards and conditions

of employment are regulated by the collective agreement between the University and CUPE Local 3906.

### Awards

A variety of internal and external scholarships are awarded annually and graduate students are encouraged to submit an application to all for which they are eligible. Details on External Scholarships and Internal Scholarships, Bursaries and Travel Scholarships may be found on the AwardSpring tile within Mosaic. Students will receive e-mail notification outlining application procedures for the scholarships. Both internal and external awards may be used either to add to, or to make up, the minimum student stipend at the discretion of the student's supervisor and the program manager in accordance with policies outlined in Graduate Calendar.

All students who have successfully earned external funding must provide a copy of the award letter to the Medical Sciences program office via email at medsci@mcmaster.ca.

## Vacations

Full time students are provided two weeks of vacation plus statutory holidays and university holidays. Please see section 2.5.8 of the School of Graduate Studies Calendar.

## Leaves of Absence

If students require a leave of absence for specific reasons such as medical or parental leave they should consult the Graduate Calendar section 2.5.7. Leaves must be approved by the School of Graduate Studies. Any absence from the laboratory for any reason must be brought to the attention of the student's supervisor.

## Petitions for Special Consideration

In addition to requests for a leave of absence, other situations may require a Petition of Special Consideration. These might include requests for bereavement leave for the death of a family member. Students should consult section 2.5.9 of the Graduate Calendar.

## Employment Regulations

Full-time graduate students who wish to work at McMaster beyond their TA employment must consult section 2.5.4 of Graduate Calendar.

## Supervision and the Supervisory Committee

Each graduate student will have a supervisor who is a member of graduate faculty and additional faculty who will provide leadership and guidance to the student throughout the time that the student is registered in the Program. The Supervisory Committee will consist of 3 Faculty members (including the Supervisor), two of which must hold supervisory privileges in the Medical Sciences graduate program. Faculty members who agree to supervise students should see the Graduate Calendar outlining their responsibilities (see Section 1.2). In some cases, a fourth member may be added to the Supervisory Committee if additional expertise is warranted. A request for an external faculty to sit as a member of the Supervisory Committee requires a letter stating the reason for the request as well as the faculty members CV. The appointment of any committee member that is not a faculty member of McMaster University must be approved by the Associate Dean of Graduate Studies (FHS) and the Dean of the School of Graduate Studies.

### Supervisory Committee

The supervisor is responsible for assembling a Supervisory Committee usually consisting of the Supervisor and two other faculty members. Changes to the Supervisory Committee membership including the Supervisor are only considered under exceptional circumstances as outlined in the Graduate Calendar (see section 1.2.4 on The Supervisory Committee). If the supervisor leaves the University temporarily, is on extended research leave, or is required by the University to perform other duties which prevent effective supervision, the supervisor must make formal arrangements for an interim supervisor (usually another Supervisory Committee member) in consultation with the Assistant Dean of Medical Sciences and their Departmental Chair.

### Supervisory Committee Meetings

The Supervisory Committee must meet with the student within six months from the time that the student first registers in the Program. Before the first meeting of the Supervisory Committee, the supervisor will provide the Area Coordinator with an Education Plan for the student which may be downloaded from the website at: (https://fhs.mcmaster.ca/medsci/booklets_and_forms.html). The Education Plan, which must be completed by the end of the third month of registration in the Medical Sciences program, will name the chosen committee members, summarize the student's thesis topic, identify the required Graduate Courses (Masters, Doctoral or Extra Credit) to be taken by the student, identify the forum in which to present a research seminar (e.g. Smooth Muscle, Allergy and Immunology, Vascular Biology Group) and provide the date of the first supervisory committee meeting. If any changes are made to the Education Plan, the Area Coordinator must be informed by the Supervisor.

It is the responsibility of both the student and the Supervisor to schedule regular committee meetings. The purpose of these meetings is to discuss the progress of the student. The Area Coordinator will attend the first supervisory committee meeting as a non-voting observer to acquaint him/herself with the student and members of the committee. The Area Coordinators provide a useful channel of communication between graduate students and supervisors and can

assist the Assistant Dean of Medical Sciences and the Associate Dean of Graduate Studies (Health Sciences) in cases of conflict resolution. After the first meeting, each student is expected to meet with his/her Supervisory Committee at least once a year and in some cases, the committee may recommend more frequent meetings. A Supervisory Committee meeting may be particularly important if the student is having academic problems or difficulties with the research project. On these occasions, more frequent, follow up meetings may be recommended.

## MSc Supervisory Committee Reports

One week prior to each Committee Meeting, students will forward a written report to committee members outlining their progress to date and planned experiments. The report should be organized into sections including Introduction, Hypothesis, Specific Aims, Methods, Results, Discussion and Future Directions. The Report should not exceed 25 pages double spaced including Figures and References and should be viewed as a learning tool in the art of communicating science. At the end of the meeting, a Supervisory Committee Report Form will be completed and submitted electronically to the Medical Sciences office at medsci@mcmaster.ca. The MSc Supervisory Committee Report forms can be found on Medical Sciences website at:
http://fhs.mcmaster.ca/medsci/booklets_and_forms.html

On the report, each committee member must indicate whether the progress made by the student has been excellent, satisfactory, marginal or unsatisfactory. If a marginal or unsatisfactory grade is given by any one member, another committee meeting must be held within three months to re-assess the student's progress and the Area Coordinator or Assistant Dean may be invited to attend this meeting at the request of either the student or the supervisor. A student with unsatisfactory or marginal ratings on one or more supervisory committee reports may be required to withdraw from the Program.

## PhD Supervisory Committee Reports

One week prior to each Committee Meeting, PhD students will complete the Student Portion of the Committee Report using the online portal. Students should email medsci@mcmaster.ca to receive the personalized link to their committee report and ensure their committee members are captured in Mosaic correctly. The report should be organized into sections including Introduction, Hypothesis, Specific Aims, Methods, Results, Discussion and Future Directions. The Report should not exceed 25 pages double spaced including Figures and References and should be viewed as a learning tool in the art of communicating science. After the Student Portion has been submitted, the Supervisor and Committee Members will be automatically sent a link to review and rank the student's progress after the meeting. It is the responsibility of the student and Supervisor to ensure that PhD students have a committee meeting at least once per year or the supervisor will be penalized in the amount of $8,000. If a marginal or unsatisfactory grade is given by any one member, another committee meeting must be held within three months to re-assess the student's progress and the Area Coordinator or Assistant Dean may be invited to attend this meeting at the request of either the student or the supervisor. A student with unsatisfactory or marginal ratings on one or more supervisory committee reports may be required to withdraw from the Program. **The Medical Sciences internal deadline to complete and submit the PhD Supervisory Committee Report each academic year is October 31st.**

## Orientation and SGS Mandatory Courses

All graduate students, including part-time students, must complete two SGS courses within the first month of their first term after admission. These two courses are:

SGS 101- Academic Research Integrity and Ethics and
SGS 201 - Accessibility for Ontarians with Disabilities Act (AODA).

Students may not register for subsequent years or graduate until they have completed these courses**.** See section 2.6.7 of the School of Graduate Studies Calendar. A series of orientation sessions is provided for all new graduate students at the beginning of every year. These sessions include: Bio-safety training; Central Animal Facility orientation; WHMIS; Fire Safety lecture; Waste Management; Radio-isotope management (if required for their project); Health Sciences Library Tour. On-line health and safety courses must also be completed regarding slips, trips and falls, ergonomics, and asbestos. Most of these sessions are mandatory and students who do not attend the mandatory sessions will not be allowed to work in research laboratories or in the central animal facility. Annual update sessions are also required for WHMIS, Biosafety and Fire Safety. Depending on the nature of the research additional training may be required and recommended by their supervisor.

## Course Requirements for MSc and PhD Degrees in Medical Sciences

At the MSc level the candidate must complete, with at least B- standing, at least one half 700-level graduate course in Medical Sciences, and one graduate-level half course in Medical Sciences or any other Faculty (with approval from the supervisory committee and Assistant Dean of Medical Sciences).

A candidate for the Ph.D. degree must comply with the School of Graduate Studies Regulations for the Degree Doctor of Philosophy, including the completion of the equivalent of three half graduate courses beyond the B.Sc. or one additional half course in Medical Sciences beyond those required for the Master's degree. The three half courses beyond the B.Sc. must include at least one half 700-level graduate course in Medical Sciences, and two graduate-level half courses in Medical Sciences or any other Faculty (with approval from the supervisory committee and Assistant Dean of Medical Sciences). If the additional half course beyond those required for the Master's degree is taken outside of the Faculty of Health Sciences, the approval of the candidate's supervisory committee and the Assistant Dean is required.

Every opportunity is extended to the students enrolled in any graduate course to provide feedback to the course coordinator (e.g., relevance and quality of content, quality of instruction, workload, etc.) and program courses are formally evaluated. The Course Coordinator will provide each student with an opportunity to complete an anonymous electronic Instructor and Course Evaluation, which are reviewed by the instructor and Assistant Dean.

## Registration

Students must access the Mosaic system to register for courses and add or drop courses. If students have completed their course requirements, they must enrol in SGS 700 to indicate that they are continuing to conduct research.

A student wishing to take a course must obtain the permission of the Course Coordinator before registering for that course. **Once permission has been granted, students will forward the permission, along with their student ID number, to msadmit@mcmaster.ca and the Medical Sciences program staff will grant permission in Mosaic.** A course outline will be provided by the Course Coordinator to graduate students. The outline must specify the following: the content and duration of the course; the nature and timing of course assignments; the method of assessment that will be used to evaluate the student's work and any penalties that may be assessed for lateness. If the course is to extend beyond the academic term or session, or if assignments are to be due beyond the end of term or session, such arrangements must be specified clearly in the course outline. A Course Coordinator will be allowed some flexibility to shift the focus of the course as research in a particular field may evolve over time. However, the amount of work expected, the schedule of assignments and due dates, and the procedures for evaluation should not change without approval. The Course Coordinator is responsible for keeping students informed (in writing) of any changes to a course (e.g., lecture and assignment dates) as it progresses.

## Course failure

A student who fails to obtain at least a B- grade in a Graduate Course is normally asked to withdraw from the Graduate Program. In some cases, the student's Supervisory Committee, and Assistant Dean, may advise the Associate Dean of Graduate Studies (Health Sciences) that the student should: a) take an alternative course, or b) repeat the course. Such a recommendation should be made in writing to the Associate Dean of Graduate Studies (Health Sciences) within one month of the student's grade being announced, outlining the possible reasons for the failure. The Associate Dean will consider this request and decide on withdrawal recommendations on behalf of the Faculty's Graduate Admissions and Study Committee. If a student is ill or absent for personal or family reasons prior to an examination or course deadline, this must be brought to the attention of the Course Coordinator as early as possible, so that the examination or deadline can be deferred at the Course Coordinator's discretion. Excuses made after the fact will not be accepted.

# Withdrawal from the Program

Any student wishing to withdraw for personal reasons is expected to submit a Request for Change in a Graduate Student's Status form, accompanied by a letter outlining their reason for withdrawal. The form is available at https://gs.mcmaster.ca/current-students/forms-and-policies-for-graduate-students-staff-and-faculty/

## Research Seminar Requirement

In addition to the course requirement for the MSc and PhD degrees, all graduate students in Medical Sciences are expected to present at least one research seminar at McMaster during their MSc and PhD studies. These seminars should be to a research audience larger and external to the student's usual research group and provide the student with the opportunity to answer questions about their research. There are regular forums (e.g., Smooth Muscle, Allergy and Immunology, Vascular Biology Group, FHS Research Plenary, Medical Sciences Research Day) in which to present a research seminar (a poster presentation does NOT qualify). If there is no appropriate forum in which to present a seminar, the Assistant Dean of Medical Sciences should be consulted to discuss with the Supervisor and Area Coordinator where and when the student may present. This information should be included by the Supervisor on the student's Education Plan, MSc and PhD committee report forms or in a separate letter stating when the student fulfilled this requirement.

## Transfer from MSc to PhD Degree

The Program encourages students who are making excellent progress with their project and desire to continue onwards for a PhD degree to consider transferring directly into the PhD program without defending an MSc. Generally, a student who wishes to transfer to the PhD program prior to the completion of a Master's degree will be expected to have completed the course requirements for the MSc (one full course or equivalent) with at minimum a B+ average. If, however, the course requirement is not complete at the time that the student wishes to transfer (e.g. a desired half-course is not offered until the following academic year), then a letter seeking permission to proceed with the Transfer should be sent to the Assistant Dean of the Medical Sciences Program requesting the transfer and the student needs to complete a Petition for Special Consideration form to the Program, who will forward the request for consideration of approval by the Associate Dean of Graduate Studies (Health Sciences). Students wishing to transfer should see section 2.1.2 and 2.1.3 of the General Regulations and the statement entitled "Policy and Procedure for Transfer from MSc to PhD - Medical Sciences" of the School of Graduate Studies Calendar.

Please note that when a transfer has been completed and approved the term count in the PhD program will be counted from the date of initial registration in the PhD program. The student may begin work on the PhD only after the transfer is approved.

### Transfer procedure

The following instructions apply to students who are enrolled in the MSc stream within the Medical Sciences Graduate Program wishing to transfer to the PhD stream without defending their MSc degree. Students may not transfer from the Medical Sciences Program to another Graduate Program. The intent to transfer should be indicated at the students 2nd or 3rd supervisory committee meeting (no sooner than 8 months, and no later than 22 months after registration in the MSc program). Students to transfer from the MSc to the PhD program will. For the committee meeting, the student must submit a one-page outline of the PhD project, including hypothesis and specific aims. The supervisory committee will then reach a consensus on one of the following

recommendations:
1. Proceed to PhD without completing MSc 2. Do not proceed to PhD, but complete MSc degree. Following the meeting and the decision, the supervisor must submit a letter to the Assistant Dean of Medical Sciences indicating the rationale for the student to be transferred to the PhD program.

The following information is required to proceed with a transfer:

1. A copy of the Supervisory Committee Report;
2. A letter from the Supervisor to the Assistant Dean indicating the rationale for the transfer;
3. A "Request for change in graduate student status" form which can be found on the School of Graduate Studies website: https://gs.mcmaster.ca/resources/request-for-change-in-a-graduate-students-status/

All documentation should be submitted electronically to the Medical Sciences office at medsci@mcmaster.ca.

## PhD Comprehensive Examination

The purpose of the Comprehensive Examination in the Medical Sciences Graduate Program is to establish that a doctoral student has acquired the appropriate intellectual skills and abilities to continue their career trajectory as an independent scientist.

**The first attempt of the Comprehensive Examination must occur within twenty-one months of a student's registration in the PhD program** (see timing of examination details below)**.** In the event that a re-examination is required, it must be completed within twenty-three months of the student's initial registration in the program. Please note, comprehensive examinations cannot be scheduled in the month of August.

The central aims of the Comprehensive Examination are to evaluate the doctoral student's ability to acquire and critically appraise information on a health topic relevant to the Canadian Institutes of Health Research (CIHR) mandate, to formulate a hypothesis addressing an outstanding question in the field, and to design an experimental plan to test this hypothesis. These goals are to be achieved in the form of a CIHR-style grant proposal, acknowledging that creative writing is critical for the student's future success.

The key elements examined during the Comprehensive Examination are the efficient assimilation of essential information about the specific topic, the identification of important issues, the formulation of a hypothesis that brings order into the field under review, and the validity of the experimental plan. The student will be expected to present and defend his/her grant proposal. This includes providing reasoned arguments in support of his/her interpretation of the scientific area under study, demonstrating his/her ability to use the information acquired to formulate a hypothesis, and rationalization of the weaknesses and strengths of the experimental approach. The grading of the Comprehensive Exam is Pass with Distinction, Pass or Fail.

Only two attempts at the Comprehensive Examination are permitted under any circumstances. If a student fails both attempts at the Comprehensive Examination, he/she will be requested to

withdraw from the PhD Program. However, a student who has transferred from the MSc Program may be permitted to complete their MSc degree, if this is recommended by the Associate Dean of Graduate Studies (Health Sciences).

The Comprehensive Examination consists of written and oral components. The written component is a CIHR -style grant proposal. The oral component of the Comprehensive Examination requires the student to provide reasoned arguments in support of his/her interpretation of the scientific area under study, to demonstrate his/her ability to use the information acquired to formulate a hypothesis and develop a sound and logical experimental plan that addresses the hypothesis, to rationalize weaknesses and strengths of the experimental approach.

## Selection of topics

After careful consideration, the Student and Supervisory Committee must agree on the topic of the grant proposal that will be of interest and value to the student and which merits independent study. The topic may be related to the student's work but must be an extension thereof or a new direction and cannot be identical in content to the student's thesis, any projects ongoing in the lab, or any of the grants held or submitted by the supervisor. The topic may also be unrelated to the student's area of research. **Prior to submission of the proposed topic to the Medical Sciences Graduate Office, the topic must be approved by the appropriate Medical Sciences Area Coordinator or a designate.**

Responsibilities for ensuring that the proposed research is genuinely novel rests initially with the student, who could be considered guilty of academic dishonesty, if a proposed research plan was subsequently found to be copied from any existing funded or applied for grant proposal. Students must therefore declare any related work on the registration form, when registering for their comprehensive examination with the program, so that no misunderstanding can occur.

## Timing of the examination

The Medical Sciences program expects PhD students to take the Comprehensive Examination between **12 and 20 months after registration** and requires that students complete the examination within 23 months of registration. Students must submit a Petition for Special Consideration for approval for any exceptions. Students are normally expected to take the examination during the first or second term of the second year following their entry into the doctoral program and must complete their first attempt of the examination by the end of the twenty-first month. If necessary, their final attempt must be by the end of the twenty-third month following entry into the Medical Sciences Doctoral program. These time limits will be strictly enforced, except in cases of documented major medical problems or approved leaves. Any student who has not completed his/her first attempt at the Comprehensive Examination by twenty-one months will be considered to have failed the first attempt and will only be permitted one further attempt within the following two months. A student who has not completed the examination within twenty-three months of entering the PhD Program in Medical Sciences will be asked to withdraw from the Program. There are four specific annual windows (typically October, January, March, and May) by which the students must register for the Comprehensive Examinations.

## Time to prepare

As the Comprehensive Examination is part of a PhD student's graduate training the final choice of the topic must be approved by the student's supervisory committee and the area coordinator (or delegate). After submission of the registration form, the student is not permitted to spend more than five weeks in preparation of the written part of the examination. An additional week (seven calendar days) is allowed for the completed grant proposal to be appraised by the Examiners. During this period, the student is expected to prepare for his/her oral presentation.

Once the date of the examination has been set, it may only be delayed for reasons of ill health or a similarly weighty reason. If a student fails to complete the grant proposal in time without such a reason, the student will be considered to have failed the first attempt at the examination. After a second failure to submit the proposal on time, the student will be considered to have failed the Comprehensive Examination and will be asked to withdraw from the PhD Program.

## Composition of the examining committee

The examining committee will consist of **one external examiner (voting) who will be approved by Assistant Dean (Medical Sciences), the Area Coordinator (or designate) of the relevant Medical Sciences Area (voting) who will also chair the examination, a member of the supervisory committee (COMP advisor; voting), and the supervisor (non-voting). Only one member of the student's supervisory committee may be a voting member on the Examining Committee.** At least two of the examiners must be from the Graduate Faculty, defined as those faculty approved for participation in the Graduate Programs in Health Sciences. It may be appropriate in some cases to include a faculty member from another graduate department at McMaster. The final selection will be based upon the expertise and availability of the faculty suggested by the supervisory committee. In the case of a re-examination, the Examining Committee will, where possible, remain the same. The Assistant Dean (Medical Sciences) may act on behalf of the supervisory committee in approving topics.

## Composition of the re-examination committee

In the event that a candidate's first attempt of the oral component of the exam is considered unsatisfactory, the Assistant Dean of Medical Sciences (or appropriate delegate) **must** attend the candidate's second oral examination attempt. In such cases, the Assistant Dean (or designate) will not take part in the examination and will not vote on the candidate's performance. The purpose of their presence is to ensure that proper procedures are followed and that examinations are comparably conducted. The Assistant Dean (or designate) may be asked by the Examination Committee to comment on these points.

## Role of the examination chair

The Area Coordinator (or designate) of the relevant Medical Sciences Area will chair the comprehensive examination. The Assistant Dean or Medical Sciences Graduate Staff will designate an Alternate Chair if the student's supervisor is the corresponding program area coordinator. The Chair will ensure that the rules governing the conduct of the examination are observed by both the Examiners and the student and maintain comparable examination standards from one occasion to another.

The Chair must ensure that the examination takes place in a constructive atmosphere, and that the Examiners' questions are both pertinent (i.e., fall within the boundaries of the topic) and sufficiently probing. The Chair may also question the candidate. The Chair may wish to rephrase questions/answers for clarification or bring a line of questioning to a close if the limits of a student's knowledge or understanding have been reached. The Chair also makes brief notes of the Examiners' questions and of the student's responses.

## Role of the comprehensive examination advisor

The Comprehensive Examination Advisor will guide the student in preparing for the Comprehensive Examination by helping define the limits of a topic, strategies for effective grant writing and by offering help with interpretation of difficult points. The Comprehensive Examination Advisor normally meets with a student on two or three occasions prior to the examination but should not read or comment on the draft or final proposal prior to the examination. **A copy of the grant proposal must be provided to each examiner, and, in addition, an electronic copy must be submitted to the Medical Sciences Program office by 3 p.m. on the corresponding submission deadline date.** All examiners must read the research proposal. All voting examiners must bring their completed evaluation forms of the written grant proposal to the examination using the form provided by the program. These evaluations must clearly indicate whether the proposal is acceptable. These evaluations will later be forwarded to the student by Medical Sciences Program.

During the oral examination, each Examiner is expected to ask questions related to the topic of the grant proposal, and the strengths and weaknesses of the experimental plan. Examiners should ask questions that probe the depth of the student's knowledge and require the student to demonstrate reasoning abilities. Examiners should avoid providing answers to questions and should not prompt the student. Examiners may take notes of their questions and the answers if they wish but are not required to do so.

## Role of the Supervisor

The role of the supervisor is restricted to helping the student select possible topics for examination and suggesting possible examiners. Since the Comprehensive Examination is intended to provide an independent evaluation of the PhD student's abilities, the supervisor is not expected to help the student prepare for the examination. The supervisor must not make any demands (for laboratory work etc.) on the student during the five weeks that the student devotes to the Comprehensive

Examination. A supportive and encouraging attitude is expected, since this may be a stressful time for the student. The supervisor, as a non-voting member of the examination committee, will be allowed to ask questions and will be part of the deliberations. The Supervisor should not provide answers to questions asked by the Examination Committee or otherwise interfere with the evaluation of the student's ability to independently address questions.

## Preparation for a Comprehensive Examination

1. Each student who is required to take the Comprehensive Examination will be notified in writing by the Medical Sciences Program Office. This email will be sent after the student has been enrolled in the PhD Program for 9 months. Along with this email, the student will receive a schedule of registration dates and the registration form.

2. The members of the supervisory committee will agree on a comprehensive examination advisor. The Supervisor must reply to the Medical Science Program office indicating when the student intends to take the examination and the name of the comprehensive examination Advisor.

3. The student will meet with the comprehensive examination advisor to clarify the examination procedures and complete the Medical Sciences Comprehensive Examination Registration Form (available at https://fhs.mcmaster.ca/medsci/booklets_and_forms.html). It is the student's responsibility to submit the form (electronically) to the Medical Sciences Program Office by 3 p.m. on the day of registration. **Failure to submit the form by that time will disqualify the student from taking the comprehensive examination in the corresponding round.**

4. The student will prepare a CIHR-style grant proposal. It is expected that the comprehensive examination advisor will offer the student help in locating key references and review articles, as well as in the discussion and interpretation of difficult points, and the formulation of the hypothesis. However, the student should not expect the comprehensive examination advisor to comment on the text of his/her grant proposal prior to their submission. The comprehensive examination advisor must make him or herself available to meet with the student on two or three occasions to discuss aspects of the grant proposal.

5. The grant proposal will follow CIHR guidelines (10 pages maximum, including figures, tables, charts and photographs). A progress report, response to previous reviews, expertise and resources, budget and CV module as denoted by CIHR are not required. All text must be single-spaced, font size 12, with references cited by number. References given in the proposal must be cited in full, using a single consistent journal style, and must include the title and first and last page numbers. Students will be assumed to have read all references cited, unless the reference is unobtainable, in which case the secondary source must also be cited (e.g., reference # in [#]). Please note a) letters of collaboration are not required; b) a detailed budget is not required however, students are to assume an average budget of $100,000 to $150,000 per annum and a 3-5 year funding time-frame; c) students may include their own preliminary data; d) students do not have to be experienced in the technology but should have an understanding as to the strengths and limitations of the proposed research;

e) students should understand how the data acquired will be analysed and give consideration to N sizes necessary for the studies proposed.

6. The student will arrange a meeting for the examination and send the meeting details to the Graduate Program Staff who will attach the details to the calendar information for the student, the supervisor, the examiners, and the program area coordinator. The examination form will be sent to the Examination Chair. Students should feel free to contact the Examination Chair or the Graduate Program Officer at any time for a progress report, or if they experience difficulties of any sort. If the examination is being held in person, the examination room will be equipped with Computer, AV equipment & Smart Board technology.

7. The student must deliver a copy of the grant proposal to all members of the Examining Committee and submit an electronic copy of the grant proposal to the Medical Sciences Program Office by 3 p.m. on the submission due date. If a grant is received late without adequate reason, examiners will have the option of failing the student. The cost of providing copies of the grant proposal is the responsibility of the student. At this point, the student may contact the Examination Chair to review the final steps in the procedure and to clarify any questions they may have about the oral examination.

## Examination

The Examination Committee will meet 15 minutes before the scheduled time of the oral examination. The Chair will first brief the examiners on the aim of the examination and the procedures that will be followed. This briefing is of particular importance to faculty who function infrequently as examiners. The Examination Committee will also discuss the written evaluations of the grant proposal provided by each examiner and areas that require probing in the oral examination. These preliminary discussions will take place in the absence of the student or any observers. A maximum of 2 hours and 15 minutes will be allowed for the oral examination.

The Chair will then allow a brief recess during which the candidate and any observers may enter the room. AV equipment is to be set up prior to the examination. **The Chair will then allow 15 to 20 minutes for the student to present his/her proposal**. Although visual aids may be used and brief notes consulted, the student's presentation may not be read from a prepared text. No interruptions are permitted during a student's presentation.

Each examiner is expected to question the student at the end of the presentation. Questions should be fair and non-threatening, and the student should be given sufficient time to digest questions and to formulate answers. The Chair may rephrase or clarify questions asked by the examiners. The Chair should terminate any line of questioning that proves unproductive.

At the end of the examination, everyone except the Examining Committee is asked to withdraw from the examination room while the Committee assesses the performance of the student. The Chair secures the written votes of the Examiners (the Chair, the comprehensive examination advisor and the External) on the form provided. The student's supervisor is a non-voting member of the examination committee but will be allowed to ask questions and observe the Examining

Committee's deliberations. The supervisor will not vote and cannot influence the pass/fail decision or the pass with distinction decision. For a student to pass the unanimous approval of the examiners is required; abstentions are not permitted. In the case of a negative vote or votes the Committee will determine the requirements for re-examination of the student, specifically whether the written grant must be revised and whether the topic must be re-examined orally. The Chair will then communicate the decisions of the Examining Committee to the student verbally and send the original signed examination form to the Program Office, which will forward the completed form to SGS.

## Assessment of the examination

The examiners will evaluate the written and oral components of the examination separately and must unanimously agree that the student's performance is satisfactory in both written and oral components for a pass to be granted. The key elements examined in the written component of the Comprehensive Examination are, the significance, impact or importance of the work proposed; the likelihood that it will, directly or indirectly, lead to the creation of new knowledge, the originality, or novelty of the concepts and hypotheses being pursued in the application, the innovation shown in the approach to the research problem, and the appropriateness of the research plan, including its feasibility, statistical soundness and the use of the best available methodologies. Please refer to the criteria for assessment outlined in the table below. Failure to meet the designated length of the grant proposal or to address the topic adequately is unacceptable and will be considered as an unsuccessful first attempt, regardless of the student's performance in the oral examination. All examiners (the Chair, comprehensive examination advisor and the External) must bring the completed evaluation forms of the grant proposal to the oral examination. These evaluations must indicate clearly whether or not the grant proposal is acceptable. For the oral component of the Comprehensive Examination, the student is expected to provide reasoned arguments in support of his/her interpretation of the scientific area under study, to demonstrate his/her ability to use the information acquired to formulate the hypotheses, and to rationalize weaknesses and strengths of the experimental approach. Comprehensive knowledge of the basic concepts and facts relating to the disciplines that underlie the grant proposal and the field of the student's thesis work will be expected upon questioning by the examiners. After the examination, the Chair of the Examining Committee will summarize the opinions of the Committee with respect to the written proposal and oral examination, and within one week, will send this written summary together with the evaluations of individual examiners to the Medical Sciences Program Office, which will then forward copies to the Student, the Supervisor, and the Assistant Dean of Medical Sciences. These written reports are sent whether the student passes or fails. At the same time, if re-examination is required, the Chair of the Examining Committee will inform the student in writing.

## Criteria for Assessing the PhD Comprehensive Examination: Written Proposal

| Criterion | Pass | Fail |
|---|---|---|
| **Conforms to requirements and includes all components** | Conforms to the requirements outlined in graduate handbook including introduction and background, problem statement and research questions, literature review, research design and methods, feasibility, and timeline. Submitted within prescribed parameters (e.g., page length). | Does not conform to the requirements and does not include all components. |

| Criterion | Excellent | Satisfactory | Unsatisfactory |
|---|---|---|---|
| **Coherence (Conceptual Organization)** | Comprehensively summarized the evidence, commonalities, and discrepancies across literature to address the purpose/hypothesis of the proposal. Identified novel ideas and solutions. Reasoned persuasive arguments are presented to support interpretation of the issues under study. | Summarized the evidence to address the purpose/hypothesis of the proposal. Arguments are presented to support interpretation of the issues under study. | There is limited or weak summary of the evidence to address the purpose/hypothesis of the proposal. Arguments to support interpretation of the issues under study are weak. |
| **Presentation and Quality of Writing** | Paper is very well organized. Ideas flow very logically and clearly. Grammar and spelling are consistently accurate. | Proposal is well organized. Ideas flow logically and clearly. Grammar and spelling are mostly accurate. | Paper is not well organized. Ideas do not flow logically and clearly. Many errors in grammar and spelling. |
| **Significance** | Very clear statement of purpose/hypothesis of the proposal. Thorough support provided for importance of the research using relevant literature. Clear rationale for relevance of the research. The purpose is comprehensively addressed through the proposal. | Clear statement of purpose/hypothesis of the proposal. Some evidence provided for importance of the research. Some rationale for the relevance of the research. The purpose is addressed through the proposal. | Lack of clear purpose statement. Limited discussion of rationale for the research and relevance. Purpose is not well addressed in the proposal. |
| **Originality** | An innovative hypothesis is proposed with novel techniques/approaches. | Some innovation in the hypothesis and or methods is proposed. | Study proposed is very similar to recent work and there is little to no innovation in the hypothesis or approaches. |
| **Appropriateness of the Research Plan** | The research plan will test the hypothesis and proposes to use novel tools and appropriate methodology. The aims/objectives are integrated but are not dependent on one another. The proposed plan is feasible with sound justification for testing hypothesis and is within the ethical standards of the field of research. | The research plan will test the hypothesis and proposes to use appropriate methodology. The aims/objectives are somewhat integrated. The proposed plan is feasible with some justification for testing hypothesis and is within the ethical standards of the field of research. | The research plan does not adequately test the hypothesis. The rationale for the study is poorly described. Methods are poorly described and unsubstantiated and do not test hypothesis. The aims/objectives are not integrated well and depend on one another. |

**Criteria for Assessing the PhD Comprehensive Examination: Oral Defence**

| Criterion | Excellent | Satisfactory | Unsatisfactory |
|---|---|---|---|
| **Knows the material** | Critical appraisal and knowledge of a wide range of literature relevant to the proposal and leading to the research question. Comprehensively identified and presented methodological strengths and limitations of the included literature. | Critical appraisal and knowledge of the literature to support the research question. Identified and presented some of the methodological strengths and limitations of the included literature. | Limited critical appraisal of the literature and presentation of the methodological strengths and limitations of the included literature. |
| **Understand the fundamentals of the topic of the proposal** | Demonstrated a clear and cohesive understanding of the fundamental concepts related to the proposal. | Demonstrated a general understanding of the fundamental concepts related to the proposal. | Limited understanding of the fundamental concepts related to the proposal. |
| **Shows adequate critical analytical sense** | Consistently demonstrated critical analysis and thinking throughout all aspects of the oral exam. | Demonstrated a moderate amount of evidence of a critical analysis in the oral exam. | Limited or no evidence of a critical analysis throughout the oral exam. |
| **Can apply knowledge to answering questions** | Demonstrated a great ability to address questions that were posed during the oral defence. | Demonstrated a moderate ability to address questions that were posed during the oral defence. | Was unable to address questions that were posed during the oral defence. |
| **Ability to present and defend an argument** | Excellent ability to present evidence to support and defend arguments discussed during the oral defence. | Moderate ability to present evidence to support and defend arguments discussed during the oral defence. | Was unable to present evidence to support and defend arguments discussed during the oral defence. |

## Pass with Distinction

Students who are deemed by all the examiners to have performed outstandingly in both written and oral parts of the Comprehensive Examination will be awarded a pass with distinction. Generally, the oral and written examination would need to be considered within the top 10% (compared to their peers at the same career stage) to be considered 'With Distinction'.

## Re-examination

If a student fails one, or both, components of the first attempt at the Comprehensive Examination, the student will be given a maximum of three additional weeks to undergo re-examination of the

written and/or the oral component. If the revised grant proposal is judged to be unsatisfactory, the student will be deemed to have failed without a second oral examination and no further attempt at the Comprehensive Examination will be permitted. If the student fails the second oral examination following a second and successful attempt at producing an acceptable grant proposal, a failure will be recorded, and no further attempt permitted. If a student fails the oral component of the first examination but the written part is satisfactory, then no new grant proposal will be required, and the student will only be re-examined orally. Similarly, if a student fails the written part of the first examination but the oral component is satisfactory, then only a revised written grant proposal will be required, and the student will not be re-examined orally. The examination committee will reconsider the 2nd attempt at the written grant proposal. Only two attempts at the Comprehensive Examination are permitted under any circumstances. The composition of the Examining Committee should, whenever possible, remain the same for a repeat examination. The procedural rules of the repeat examination and its assessment are the same as for the first examination. If a student fails both attempts at the Comprehensive Examination, the student will be requested to withdraw from the PhD Program. However, a student who has transferred from the MSc Program may be permitted to complete a Master's degree, if a recommendation is made by the Supervisor and the Assistant Dean of Medical Sciences and approved by the Associate Dean of Graduate Studies (Health Sciences).

## Summary of examination procedures

1. The student receives notification of the Comprehensive Examination after 9 months in the PhD Program. The Student and Supervisor reply and indicate when the examination will be undertaken.

2. The Supervisory Committee will designate one of the Supervisory Committee members (not the Supervisor) to assist in the coordination of the comprehensive exam (referred to as "Advisor") and serve on the examining committee. The Advisor will advise the student in the preparation of the grant proposal.

3. The student, in consultation with his/her Supervisory Committee, will select a topic for the grant proposal. The supervisory committee will identify possible external examiners.

4. The student will register for the comprehensive examination on one of the three pre-set dates for each academic year by completing and submitting the comprehensive exam form. The student will then have five weeks to prepare the written grant proposal (11 pages, excluding the one-page summary, references, and figures).

5. The External Examiner selection is based upon the suggestions of the Supervisory Committee. The Medical Sciences Program Office will recruit the External Examiner and the Chair (Area Coordinator or designate) and arrange the date of the examination. The student is responsible for arranging the details of the virtual meeting.

6. The student will deliver a copy of the grant proposal to all members of the examining committee (Chair, External, Advisor) by 3 p.m. on the pre-set submission date. In addition, an electronic copy of the proposal must be e-mailed to the Medical Sciences Program Office. **Please note: if a student fails to submit their grant proposal to all committee members**

**on/by the pre-set submission date without adequate reason, the examining committee will have the option of failing the student's first attempt at the examination.**

7. Prior to the exam, all Examiners will assess the written grant proposal by completing the evaluation form.

8. The student will present a brief (15-20 min) overview of their grant proposal and defend the proposal to the Comprehensive Examination committee.

9. At the end of the examination, the Examination Committee will deliberate on both the oral defence and written document. The Chair will inform the student verbally of the result of the examination and send the original signed examination form to the Medical Sciences Program Office.

10. The Examination Chair will send the written evaluations of the grant proposal and a summary of the Committee's opinion of the student's oral performance to the student and the Medical Sciences Program Office. Copies of this letter and the evaluations forms will then be forwarded on to the student and supervisor.

# MSc and PhD Thesis Requirements

## Thesis format

Students should consult the School of Graduate Studies booklet entitled ”GUIDE FOR THE PREPARATION OF THESES”, that explains the style and format of the thesis. This can be found at https://gs.mcmaster.ca/current-students/forms-and-policies-for-graduate-students-staff-and-faculty/

## MSc Thesis Requirements

The customary format for the MSc thesis is the traditional integrated document consisting of separate sections including Introduction, Methods, Results, and Discussion. In recent years there has been a trend to a "sandwich thesis" format, whereby the thesis is constructed around a core of papers that the student has either published or submitted for publication.

Most MSc students will not have prepared sufficient publications within their 2 years of graduate studies in the Program allowing them to use the sandwich thesis format. If, however, this is not the case and MSc students wish to use the sandwich thesis format then they should be aware that the Medical Sciences Graduate Program has additional requirements for a sandwich thesis including the following items:

1. All of the student’s work must be presented in this format and based on published manuscripts, papers that are in press and papers that have been submitted for publication. Other experimental results can only be included in Appendices.

2. The student must be the first author on a majority of the papers and a major contributor to all the papers included in the body of the thesis.

3. In a ‘sandwich thesis’, the methods used must be described in detail, either in a separate chapter or in Appendices.

4. The student’s supervisor (or acting supervisor) and Supervisory Committee will be responsible to the Assistant Dean of the Medical Sciences Program for ensuring that the above Program rules are fully implemented.

"Sandwich theses" that do not comply with these regulations will not be accepted for Defence.

## Thesis preparation and defence

Independent of the format selected, the procedure for the thesis preparation and defence is as follows (see Appendix A for a quick guide):

1. The student requests permission to write the thesis. This request is formally considered at a Supervisory Committee meeting, usually after the student has summarized the research

which he/she has done to meet the objectives of the thesis. The committee must agree unanimously with the request. "Permission to write" indicates that the student has essentially completed the experimental work.

2. A first complete draft should be submitted to the Supervisor for critical comments. After revisions and approval by the Supervisor, a complete version should be given to each Supervisory Committee member for their comments. The length of the thesis should comply with Section 3.2 of the Graduate Calendar.

3. When revisions have been made, the student will submit a completed "Approval to Submit a Master's Thesis" form to the Medical Sciences Office at medsci@mcmaster.ca. Please note that a majority of the supervisory committee membership must have approved the thesis by signing this form before the oral Defence can be arranged. This form is available at: https://fhs.mcmaster.ca/medsci/booklets_and_forms.html.

   The form must include a list of three potential External Examiners for review and approval by the Assistant Dean of Medical Sciences. The External Examiner is normally a member of McMaster's graduate faculty whose research interests may lie outside the students' immediate area of research. Once the External Examiner has been approved, the Medical Sciences Office will notify both the student and Supervisor. At this stage the student may initiate scheduling of the oral defence with their Supervisory Committee and External Examiner. Once the oral defence date, time, and location has been set, students must notify the Medical Sciences Office so that the required paperwork can be prepared. The student then distributes a copy of the thesis to all examiners including the External Examiner no later than one week in advance of the oral defence.

4. The Examination Committee must consist of a minimum of four graduate faculty members, of which at least three are members of the student's Supervisory Committee. The Supervisor will appoint one member (not the student's Supervisor or the External Examiner) to Chair the examination. The MSc Defence will be open to the Faculty of Health Sciences community to attend. Prior to the start of the defence, the Examination Chair will ask all persons except the Examination Committee to leave the room to discuss the examination format and examiner responsibilities. The examination will consist of an oral overview (15 - 20 minutes) of the thesis given by the student, followed by a series of questions asked by the members of the Examination Committee in turn. All examiners are expected to ask at least one relevant question.

At the end of the Defence, the Examination Committee will consider their verdict in closed session. The Examination Chair does not normally have voting privileges. In the event of a split decision, the result will align with the majority of votes. Should there be an even split of votes then the Chair must vote to break the "tie". The Chair will then call the student into the room to deliver the committee's decision. If a re-examination is deemed necessary, the examination committee will remain the same.

When the student has successfully completed their oral examination and has made all required revisions to the thesis as recommended by his/her examining committee, they must file an electronic version of their final thesis to MacSphere and forward the "Final Thesis Submission Form"

and “License to McMaster”, which was previously signed by the Chair of their examination committee and later by the Supervisor, to the Medical Sciences program at medsci@mcmaster.ca. For detailed information consult https://gs.mcmaster.ca/current-students/completing-your-degree/masters-thesis/

A student may wish to have copies of their thesis bound for personal use and for their Supervisor however the Program does not require a bound copy. The cost of binding is borne by the student, not by the Program nor the University.

## PhD Thesis Requirements

The PhD thesis may be submitted in the traditional format or a "sandwich" format. For either format, the entire length of the thesis must not exceed 300 type-written pages, including all figures, tables, references and appendices. If the student chooses the sandwich thesis format, then both the Graduate School rules and the Medical Sciences Graduate Program rules for a sandwich thesis must be followed. For more information see **https://gs.mcmaster.ca/current-students/completing-your-degree/doctoral-degree/**

Students should refer to the SGS guidelines on preparing a sandwich thesis for details of the requirements. A **minimum** of three published or submitted but not yet published scholarly works must be included within the sandwich thesis. **Normally, at least one** of these must be published or ‘in press"’ at the time the thesis is submitted for defence. Students should discuss with their supervisor their thesis work publication plans as normally, requests to embargo a thesis are granted for one year only, with requests for a further one-year embargo considered on a case-by-case basis.

### Procedure Leading to the PhD Defence

1. For information concerning the details of PhD thesis defence see the Thesis Defence Scheduling timetable at https://gs.mcmaster.ca/current-students/completing-your-degree/doctoral-degree/. The majority of the Supervisory Committee members must approve the thesis before the oral Defence can be arranged.

2. Following acceptance of the final version of the thesis by the Supervisory Committee, the student in consultation with their supervisor will submit their request to defend the thesis electronically through the Mosaic system. The supervisor will be required to select between the Traditional Stream or Accelerated Stream. A Traditional Stream Defence process takes approximately 7-8 weeks while an Accelerated Stream Defence takes approximately 4-5 weeks.

### Traditional Stream

The student will receive a confirmation email (to their McMaster email account) with a secure link to submit the thesis title and the estimated date to submit their thesis for examination to the School of Graduate Studies (usually four weeks from the date of the initial request to defend). Once the

student has submitted this information, the supervisor will receive an email with a secure link to complete the "Nomination of an External Examiner to the AVP and Dean of Graduate Studies" electronic form. After consultation with the Supervisory Committee, the supervisor will complete and submit this form online for the approval of all the committee members. This must be done at least one month prior to the anticipated date of approval of the thesis for submission for defence. Potential examiners should be chosen for their expertise in the area of the student's research and must not be recent collaborators of the supervisory committee members. The Assistant Dean will approve the list of proposed external examiners. After approval is received, the School of Graduate Studies will contact an examiner and secure her/his agreement to read the thesis. The Supervisor must not contact potential examiners.

When the Nominations for External Examiners have been approved the student will receive a "Ready to Propose a Defence Date" email to complete the "Submission of a Doctoral Thesis for Examination and Identification of a Date for Oral Defence" form online. The student will submit the date and time of defence, which should be pre-approved by their supervisory committee. Once submitted, the committee will receive an email that will link them to the submission form to approve the date and time of defence. In addition, each member will indicate that they have read and judged the thesis in the form in which it is to be submitted. This should occur approximately 2 months and not later than seven weeks, before the anticipated defence. The Thesis Coordinator at the School of Graduate Studies (GH-212) and the Graduate Officer for the Medical Sciences program (HSC-4H4) will be informed of the student's request to defend via email and will have access to the online process. The student usually contacts the committee members to inquire whether they desire an electronic or hard copy of the thesis. The external examiner will be provided a link to complete an online report as to whether the thesis is acceptable for defence. This report will be due at least 1 week prior to the defence date. If it is acceptable, the School of Graduate Studies will confirm the date and time and will arrange the location for the examination.

The PhD Defence is organized by the Thesis Coordinator in the School of Graduate Studies. The Examination Committee will consist of the supervisor, two members of the supervisory committee, and an external examiner. A PhD Examination Chair, appointed by and representing the AVP and Dean of Graduate Studies, will oversee the PhD Defence; the examination Chair does not have voting privileges. If the External Examiner is unable to attend in person, the Chair the questions of the External will be asked by the Chair or Supervisor in proxy.

Doctoral degree candidates who have successfully completed their oral examination and who have made all required revisions must file an electronic version of their final thesis to MacSphere and forward the "Final Thesis Submission Form", which was previously signed by the Chair of their examination committee and later by the supervisor, to the Thesis Coordinator at the School of Graduate Studies.

## Accelerated Stream

In the accelerated stream, the process differs from the traditional stream in that the Supervisor, not the Thesis Coordinator, is responsible for personally inviting the External Examiner, selecting the date and time of the defence and identifying a Chair for the defence.

The Supervisor will input the External Examiner nominee information for approval by the Supervisory Committee and the Assistant Dean. Upon approval, the Supervisor selects the External Examiner, inputs the date, time and location of the defence and uploads a copy of the thesis.

All other steps in the process are as outlined in the Traditional Stream above.

## Performance Review and Appeals

Students wishing a review of a course grade or wishing to appeal an academic or non-academic matter or decision should consult the Graduate Calendar and the University Policy on Student Appeals (link below). Any appeals must be filed in a timely fashion as indicated in Section 2.5.9 of Graduate Calendar.

## Change of the Supervisor

Graduate student supervision is described in the section 3.1 Supervision of the Graduate Calendar. The section below outlines procedures specific to the Medical Sciences graduate program. In general, once a student has been accepted into the program under a particular faculty supervisor, this constitutes a contract between the parties, and it is expected that the students will complete their studies under the supervision of the same individual that was indicated as the faculty supervisor in their offer letter. Please note that supervision of a student is a significant investment for a faculty member and their research team. The Supervisor not only makes a major funding commitment to the student's stipend and laboratory supplies (and animals for some projects), but they also commit their time for supervision. Accordingly, students are expected to commit to working with the same faculty member (as stated on their offer letter) for the duration of their thesis. However, in extenuating circumstances in which the student/supervisor/laboratory working relationship is failing, the program outlines the following important considerations for both, students and their faculty supervisors.

Students:

- If you have any concerns regarding your position as a graduate student, first and foremost you should discuss them with your research supervisor in an effort to resolve the issues. Following these attempts if you feel that the situation has not improved, you may bring it to the attention of your Area Coordinator (or the Area Coordinator of another research area if your supervisor is also your Area Coordinator). Your Area Coordinator will consider discussing it with the Assistant Dean, Medical Sciences, or taking other steps, if needed.
- After following the steps above, if your situation with your current supervisor and lab does not seem viable, the Assistant Dean will suggest the following options:
    1. You can withdraw from the program.
    2. The program will offer additional assistance to both you and the supervisor in working further to improve the relationship.
    3. You may seek another graduate supervisor within the program.

- If you decide to pursue the option #3, please keep in mind the following:

    - The program has no obligation to assist you in finding another supervisor.
    - You must continue to meet both your academic and employment responsibilities, i.e., working in the lab with your current supervisor, TAing, completing your courses, etc. as specified by the requirements of your program. Failure to do so may result in being withdrawn by the program.
    - If you succeed in finding another graduate supervisor, you will need to complete the Petition for Special Consideration form with both your current and potential supervisors signing it. The transfer will be the subject of approval by the Assistant Dean, Medical Sciences and the Associate Dean, Graduate Studies, Health Sciences.
    - If the approval is granted, you will continue your graduate studies with your new supervisor, but your term count will not be reset and the program/university will not extend any obligations to your financial support, TA/RA, etc. beyond the regular time frame as specified by the program. For example, if you transfer to a different supervisor after 3 terms as a Master's student, your term count will continue as being term 4 and so on. The program will not continue your funding beyond 6 terms, and if you had a TA/RA in lieu of TA position in your first year, you will have it in your second year in accordance with the Collective Agreement, but not beyond. Your new supervisor may continue providing you with some support beyond term 6, but it will be at their discretion, and they will not be obliged to do so;
    - If you are a recipient of the external scholarship, the condition of your holding the award may be specific to the particular research project, so you should inquire with the granting agency whether your change of the supervisor will affect your eligibility to continue holding the award.
    - Students wishing to change supervisors should be aware that their contributions to research under the initial supervisor might, or might not, meet a threshold for authorship (or other intellectual property ownership) as a result of a change in supervisor. Such matters may require input of the supervisory committee.

Supervisors:

- Graduate student performance issues should be addressed by the channels and means described in other sections of this Handbook and the Graduate Calendar.
- Encourage timely conflict resolution when disputes arise. This may require consultation with the Supervisory Committee or the Assistant Dean of Medical Sciences.
- Your student may express their desire to switch labs and look for another supervisor. While they may or may not succeed in finding another graduate supervisor in the program, their search should not affect their duties as a graduate student in your lab and your responsibilities as their supervisor. Please note that until such transfer is officially approved by all appropriate parties, you are the official supervisor of the student and as such you are responsible for paying their research scholarship and providing appropriate supervision.

## Student Support Services

McMaster University provides an excellent environment for graduate students who are interested

in receiving specialized training beyond the regular curriculum and having access to a range of special intellectual opportunities and networking events. The School of Graduate Studies offers writing workshops (e.g., writing boot camps), programs on improvement of professional skills (e.g., effective networking, communication, career planning), seminars on etiquette through Mitacs (e.g., essential interpersonal, project management and entrepreneurial skills), a national non-profit organization, and seminars on how to submit a thesis. The Graduate Student Life and Research Training Team helps students balance their work and life and prepare for future success.

The campus libraries also provide academic skills support for students and create a more visible and accessible service. They offer Academic Skills Assistance (e.g., note-taking, time management, effective reading strategies, research, and exam preparation), Writing Support Services (thesis statement, writing style, reference systems), and ESL Support (e.g., the SpeakEasy program.

There are also a lot of resources for grad students available through the MacPherson Institute such as its library resources, learning technology support, teaching assistant network, teaching and learning project support and resources.

The Student Accessibility Services (SAS) Office provides academic accommodation assistance and support to students with disabilities. Services include, assistive technologies, learning strategies, support specialist, testing centre, note-taking support, and more.

The Student Wellness Centre provides services to both full and part-time graduate students that contribute towards your personal and academic success. The Centre is staffed by highly qualified service providers with a special interest in university student wellbeing. They provide student-centered, accessible, confidential, and caring services for you. The Centre is located in the Peter George Centre for Living and Learning, Room 210/201. For more information see http://wellness.mcmaster.ca/

The Ombuds Office offers impartial, independent, and informal dispute-resolution advice and assistance to students and all members of the University community
http://www.mcmaster.ca/ombuds/

**Appendix A: Quick Guide to the Master's Thesis Defence Process in Medical Sciences**