CHEMICAL BIOLOGY GRADUATE PROGRAM

Graduate Student Handbook

2026 to 2027 Academic Year

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Welcome to the Chemical Biology Graduate Program

Welcome, and congratulations on joining the Chemical Biology Graduate Program at McMaster University. You are now part of a community that sits deliberately at the meeting point of chemistry, biochemistry, and biology, where the most interesting scientific questions rarely respect the boundaries of a single discipline. Whether your work leans toward synthesis, molecular mechanism, cell biology, drug discovery, or the development of new tools to probe living systems, you have chosen a program built around the idea that the best science happens when these perspectives are brought together.

Graduate research is a genuine apprenticeship in discovery. Over the coming years you will move from learning what is known to producing knowledge that did not exist before you generated it. That transition is demanding, and it is meant to be. You will read deeply, design and troubleshoot experiments, present your thinking to colleagues who will question it constructively, and learn to defend your conclusions with evidence and clarity. The milestones described in this handbook, from your first supervisory committee meeting through to your thesis defence, are not hurdles placed in your way. They are structured opportunities to step back, take stock of your progress, and benefit from the collective expertise of faculty who want you to succeed.

You will not do this alone. Your supervisor, your supervisory committee, the program office, and your fellow students form a network of support that is one of the real strengths of an interdisciplinary program of our size. We are small enough that people know one another, and broad enough that there is always someone nearby working on something genuinely different from your own project. Make use of that. Attend the seminars, ask questions outside your comfort zone, and treat your peers as collaborators rather than competitors. The relationships you build here will outlast your degree.

This handbook is your practical guide to the program. It brings together the specific requirements, milestones, and resources of the Chemical Biology Graduate Program. Please read it early, return to it often, and never hesitate to contact the program office when something is unclear. We are genuinely glad you are here, and we look forward to seeing the science you will do.

On behalf of the Chemical Biology Graduate Program,

Profs. Ryan Wylie and Anthony Rullo

The Program Director and Associate Director

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About the Program

The Chemical Biology Graduate Program (CBGP) at McMaster University offers MSc and PhD degrees at the interface of chemistry, biochemistry, and biology. The program is jointly supported by the Faculty of Science and the Faculty of Health Sciences. Its defining feature is interdisciplinary training: students learn to integrate chemical, biochemical, and biological approaches to solve problems at the molecular level in human health, drug discovery, and the design of new tools for studying and controlling living systems.

Graduate courses in the program are taught in an inquiry style and focus on the current literature at the interface of the contributing disciplines. Most courses are led by at least two faculty members so that students encounter complementary viewpoints on each topic. This collaborative, cross-disciplinary culture extends from the classroom to the research environment and is reflected throughout the milestones and expectations described in this handbook.

How to use this handbook

This handbook is a complement to the Faculty of Science handbook, that covers general policies that apply to all graduate students under the School of Graduate Studies (SGS). This handbook is the set of requirements and procedures specific to the Chemical Biology Graduate Program. Where the program sets a standard that is more detailed or more demanding than the general framework, the program standard is the one to follow.

In the event of any discrepancy between this handbook and the SGS Graduate Calendar, the Graduate Calendar prevails. Students and faculty are encouraged to consult the Calendar directly at the McMaster Academic Calendar.

Contact Information

The program office is the first point of contact for administrative matters. Most program announcements are sent by email to your McMaster address, so please activate and monitor your McMaster email account. Program office hours are normally Monday to Friday, 8:30 to 4:00. Forms and milestone reports should be returned to chembio@mcmaster.ca unless otherwise indicated.

Role	Name	Contact
Program Director	Dr. Ryan Wylie	wylier@mcmaster.ca
Associate Director	Dr. Anthony Rullo	rulloa@mcmaster.ca
Graduate Coordinator	Tammy Feher	chembio@mcmaster.ca
Program email (all submissions)	Chemical Biology Graduate Program	chembio@mcmaster.ca
Associate Dean, Graduate Studies (Science)	Dr. Laura Parker	adeangss@mcmaster.ca
Associate Dean, Graduate Studies (Health Science)	Dr. Steve Hanna	hannas@mcmaster.ca
Thesis Coordinator (SGS)	School of Graduate Studies	gthesis@mcmaster.ca

General University and Faculty Information

The following information reflects the general policies and services of McMaster University, the Faculty of Science, and the School of Graduate Studies. It applies to all graduate students in the program.

Key University Policies and Resources

All graduate students are responsible for familiarizing themselves with the University policies that govern their studies. The following are particularly important:

- The School of Graduate Studies Graduate Calendar, the authoritative source for all degree regulations.
- General Regulations on Supervision, and the University policy on Supervisory Relationships.
- Academic Integrity Policy and the Senate Statement on Academic Ethics.
- Research Integrity Policy and the Intellectual Property Policy.
- Policy on Discrimination and Harassment: Prevention and Response, and the Sexual Violence Policy.
- Student Code of Conduct, and the Student Appeal Procedures, Accommodations, Appeals and Petitions.
- Academic Accommodation for Religious, Indigenous, or Spiritual Observances (RISO), and Academic Accommodation of Students with Disabilities.

Summary of Faculty of Science Requirements

To receive a degree, students must fulfill all program requirements and all University regulations, including those of the School of Graduate Studies. Students with outstanding financial accounts at the end of the academic year will not receive their academic results, diplomas, or transcripts.

Requirements for All Students

Upon arrival: obtain your McMaster ID card (MacCard) and complete any conditions noted in your offer letter by the stated deadline. Failure to clear conditions by the deadline may result in the offer being rescinded. International students must hold a valid study permit for programs longer than six months and are responsible for maintaining current documentation.

SGS 101 and SGS 201: all graduate students must complete two online courses once during their graduate career, SGS 101 (Academic Research Integrity and Ethics) and SGS 201 (Accessibility for Ontarians with Disabilities Act). Each takes about an hour. Anyone who does not complete these by the SGS deadline is automatically assigned a failing grade. Confirm your registration in these courses through your Mosaic Student Centre.

SGS 700 and SGS 711: students must enrol in the placeholder course SGS 700 or SGS 711 in any term in which they are not taking another course (SGS 700 for programs charged per term, SGS 711 for programs charged per course). Failing to register in each term can affect scholarships, fee assessment, and transcript requests.

Academic advisement: Mosaic provides an Academic Advisement report that lets you track progress toward graduation against your curriculum requirements.

Failing a Course or Milestone

> **The minimum passing grade in a graduate course is a B minus (70 to 72 percent).** Failure in either a course or a milestone is reviewed by the appropriate program representative or by the Associate Dean, Graduate Studies in the Faculty, and may result in withdrawal from the program. Students permitted to remain must repeat or replace the failed course or milestone, as decided by the Faculty Committee on Graduate Admissions and Study. Further detail is in Section 2.6.11 of the Graduate Calendar.

It is the student's responsibility to follow the degree progression set out in the Graduate Calendar (Section 3) in order to complete the degree successfully.

Supervision

Supervision of MSc and PhD students is governed by the School of Graduate Studies regulations set out in Section 3.1 of the Graduate Calendar, together with the General Regulations on Supervision. The program-specific expectations for supervisory committees and committee meetings are set out later in this handbook under Program Milestones.

Academic Requirements

MSc Degree Requirements

A candidate for the MSc degree must spend at least one calendar year in full-time study at McMaster. A Master's thesis typically takes 20 to 24 months. The maximum permissible time to complete the MSc is three years from initial registration. Students beyond 24 months in the MSc program are not guaranteed a stipend or teaching assistantship.

MSc candidates are required to:

1. Complete two one-term graduate courses at the 700 level, one of which must be CHEMBIO 700A/B.
2. Give at least one seminar at the Chemical Biology Research Day in the spring.
3. Present a thesis embodying the results of original research, and defend it in an oral examination.

Qualified students may transfer to the PhD program in their second year, without completing the MSc thesis, provided their progress is judged satisfactory by their supervisory committee. The transfer process is described under Program Milestones. An Accelerated MSc pathway is also available to eligible McMaster students; see the appendix A.

PhD Requirements: Students Who Transfer from the MSc

Students on this route complete the program's coursework during the MSc phase and, by the time they transfer, will have presented their research at the Chemical Biology Research Day in the second year of their MSc. To earn the PhD, they must:

- Complete CHEMBIO 700A/B and one additional 700-level graduate course during the MSc phase, as set out under Course Requirements.
- Present their research at the Chemical Biology Research Day in the second year of the MSc.
- Pass the transfer examination to enter the PhD.
- Pass the comprehensive examination.
- Present at a departmental seminar, scheduled by the Graduate Coordinator, before the thesis defence.
- Present and defend a thesis that contributes to the advancement of knowledge.

The supervisory committee may recommend additional coursework, and students may take relevant courses offered in Chemistry and Chemical Biology, Biochemistry and Biomedical Sciences, or other affiliated departments.

PhD Requirements: Students Admitted Directly to the PhD

Students admitted directly to the PhD complete the same coursework and presentation requirements as MSc students, in addition to the doctoral examinations. To earn the PhD, they must:

- Complete CHEMBIO 700A/B and one additional 700-level graduate course, as set out under Course Requirements.
- Present their research at the Chemical Biology Research Day.
- Pass the PhD qualifying examination.
- Pass the comprehensive examination.
- Present at a departmental seminar, scheduled by the Graduate Coordinator, before the thesis defence.
- Present and defend a thesis that contributes to the advancement of knowledge.

The supervisory committee may recommend additional coursework, and students may take relevant courses offered in Chemistry and Chemical Biology, Biochemistry and Biomedical Sciences, or other affiliated departments.

Course Offerings

The program offers unique 700-level courses designed to foster interdisciplinary and independent learning. Consult course outlines for more information.

Course	Description
CHEMBIO 700A: Tools for the Chemical Biology Profession	An introduction to professional skills for graduate study and beyond, covering graduate school, safety, ethics in science, equity, diversity and inclusion in science, scientific literacy, and effective written and oral science communication. Delivered through presentations, panel discussions, and interactive activities.
CHEMBIO 700B: Topics in Chemical Biology	Team taught by at least two instructors, this course uses current literature to provide an overview of chemical biology and to demonstrate the integration of chemical, biochemical, and biological approaches to current problems in medicine, the environment, and drug design. The focus varies year to year; the integrative approach is constant.
CHEMBIO 701: Chemical Biology Colloquium A	Students prepare and present a seminar examining their own research area in detail, providing suitable background and critically discussing the field, followed by a question period. CHEMBIO 701 is a non-credit course.
CHEMBIO 702: Chemical Biology Colloquium B	Students present a seminar on their research area and also prepare a written review article on the current state of their field, including background, current research, and an appraisal of future directions, in the style of Trends in Biochemical Sciences or Accounts of Chemical Research. CHEMBIO 702 carries course credit.

Additional 700-level courses and modules are available through the Department of Biochemistry and Biomedical Sciences, the Department of Chemistry and Chemical Biology, and the Department of Biology. Consult the respective departmental websites and course coordinators for current offerings.

Academic Ethics

The Senate Statement on Academic Ethics sets out the University's expectations of its scholars. Breaches of academic ethics fall into two general categories: a disregard for the norms of scholarly integrity without necessarily intending to deceive, and academic dishonesty, which is an intentional disregard for those norms. Academic dishonesty consists of misrepresentation by deception or other fraudulent means, and may take forms such as the use of unauthorized aids, plagiarism, or the submission of work that is not one's own. All members of the program are expected to uphold these standards in coursework, milestones, and research.

Program Milestones

Graduate study in the program is structured around a sequence of milestones, each an opportunity to take stock of progress with the benefit of the supervisory committee's expertise:

- **Supervisory committee meetings**, held throughout the program for both MSc and PhD students.
- **The transfer or qualifying examination**, for students entering the PhD.
- **The comprehensive examination**, for PhD students.
- **The thesis defence**, the culminating examination for both the MSc and the PhD.

The sections below set out the requirements and procedures for each. Where a milestone involves a formal examination, the procedures here are the governing procedures for the program.

A note on timing and degree progression

Milestone timing in this handbook aligns with the School of Graduate Studies regulations and the Faculty of Science framework. The comprehensive examination timing follows Section 3.4.3 of the Graduate Calendar. Committee meeting cadence and reporting follow the Faculty of Science requirements for annual doctoral reporting. Students and supervisors share responsibility for ensuring that milestones occur on schedule and that the required reports are filed promptly. **Any costs incurred by the program due to delayed committee meetings or exams will be charged directly to the supervisor.**

Supervisory Committee Meetings

Supervisory Committee Meetings

Guidelines for MSc and PhD Students

University regulations require all graduate students to meet formally with their supervisory committee to discuss progress. These meetings provide a means of communicating and documenting the student's accomplishments and the committee's expectations. This document outlines the requirements of the Chemical Biology Graduate Program for both MSc and PhD supervisory committee meetings, and supplements the more general guidance provided in the program handbook.

At a Glance

Component	Requirement
Committee size (MSc)	At least two members: the supervisor and one additional faculty member whose scholarly interests include the student's area of research.
Committee size (PhD)	At least three members: the supervisor plus two additional members. Two (including the supervisor) must be from within the Chemical Biology Graduate Program; the third may be from outside.
Written report	~10 pages of body text, double-spaced, circulated to all members at least one week before the meeting. Page count excludes the title page, abstract, figures, and references.
Presentation	15–20 minutes at the start of the meeting, followed by committee discussion.
Grading scale	• Exceeds Expectations (EE) • Meets Expectations (ME) • Requires Follow-up (RF) • Does Not Meet Expectations (DNM)
Form (MSc)	Master's Supervisory Committee Meeting Report; returned to chembio@mcmaster.ca.
Form (PhD)	Online PhD Supervisory Committee Report, contact chembio@mcmaster.ca to initiate the report before the supervisory meeting.

Supervisory Committee Composition

The supervisor is responsible for proposing the supervisory committee, which must be approved by the Graduate Advisory Committee (GAC). Committee size differs for MSc and PhD students.

MSc Students

The MSc supervisory committee consists of at least two members:

- The student's supervisor.
- One additional faculty member whose scholarly interests include the student's area of research. The member must be approved by the student's supervisor.

PhD Students

The PhD supervisory committee consists of at least three members:

- The student's supervisor.
- One additional member from within the Chemical Biology Graduate Program.
- A third member whose scholarly interests include the student's area of research. This member may be from outside the program.

Taken together, the research interests of the committee should encompass the student's thesis topic. The committee guides the student on their research project and advises on coursework needed to support the project, prepare for transfer to the PhD program where applicable, and prepare for the comprehensive examination.

Scheduling and Documentation

Students are responsible for scheduling supervisory committee meetings in consultation with their supervisor and committee members, and for notifying the program office (chembio@mcmaster.ca) once a date is confirmed so that the appropriate reporting form can be initiated. Students are also responsible for booking any audio-visual equipment required for the meeting.

Different forms are used for MSc and PhD students:

- **MSc students:** the Master's Supervisory Committee Meeting Report form, available from the School of Graduate Studies, is to be completed at the meeting and returned to chembio@mcmaster.ca as soon as possible afterward.
- **PhD students:** an online PhD Supervisory Committee Report is used. Once the meeting is scheduled, the student receives a link by email to initiate the form.

A completed report must be on file with the program after every meeting. It is the joint responsibility of the student and supervisor to ensure that meetings take place on schedule and that reports are submitted promptly.

Meeting Schedule

MSc Students

Newly admitted MSc students hold supervisory committee meetings on the schedule below. The second meeting is required of all students; the first and third meetings are optional, though both are strongly recommended. Additional meetings may be called at any time, particularly if the student encounters academic or research difficulties.

- **First meeting (optional, 4 to 6 months after registration).** The purpose of the first meeting is to confirm that the student has a well-defined project and is making the necessary effort to become well-versed in the background literature. Students are expected to work toward mastery of the foundational literature of their field within the first year. Some preliminary progress at the bench is also expected at this stage.
- **Second meeting (required, 12 to 14 months).** By the second meeting, the student is expected to have continued to develop a strong grasp of the relevant literature and to have made further headway in their research. In certain circumstances this meeting may be replaced by the PhD transfer examination, which is governed by separate guidelines.
- **Third meeting (optional, 18 to 20 months).** The third meeting establishes what the student needs to do to complete the MSc thesis. Alternatively, with the support of the supervisor, the student may request permission at this meeting to proceed to the transfer examination for entry into the PhD program.

Accelerated MSc Pathway

The Chemical Biology Graduate Program offers a one-year Accelerated MSc pathway for eligible students. Accelerated MSc students who plan to graduate with the MSc within twelve months follow a compressed schedule of supervisory committee meetings:

- **First meeting (within 2 months of registration).** The purpose mirrors that of the traditional MSc first meeting: to confirm that the project is well-defined and that the student is engaging substantively with the relevant literature. Because Accelerated MSc students enter the program from an undergraduate thesis project with the same supervisor, this meeting also serves to confirm the planned research trajectory for the MSc.
- **Second meeting (by 6 months; advised but optional).** A second meeting may be held by the six-month mark to review progress and address any issues that have arisen. This meeting is encouraged but not required.
- **Third meeting (by 10 months).** Permission to write up the MSc thesis is typically requested at this meeting. The student should arrive prepared to demonstrate that the body of work is sufficient for a Master's thesis, with enough time remaining to write and defend by the end of the twelfth month.

Transferring to the PhD program. Accelerated MSc students who plan to transfer to the PhD program are not eligible to follow the accelerated meeting schedule. Such students follow the

meeting schedule and timeline of traditional MSc students described above, including the timing of the PhD transfer examination.

PhD Students Following Transfer from MSc

MSc students who intend to transfer to the PhD program must complete and pass the PhD transfer examination within 22 months of first registration in the MSc program. The transfer examination can take place as early as 12 months but normally takes place shortly after the eighteen-month mark, and is governed by separate guidelines. After successful transfer, the student continues to meet with their supervisory committee to review progress. The PhD comprehensive examination, normally held between 18 and 20 months after entry into the PhD program, is also governed by separate guidelines. Comprehensive exam must be completed by the 24th month after entry into the PhD program. Beyond formal examinations, doctoral students must meet with their committee at least once each year. Additional meetings may be arranged at any time at the request of the student or the supervisor.

PhD Students Admitted Directly to the PhD Program

Students who enter the PhD program directly with an MSc degree from another institution follow a distinct timeline during their first year. After this initial period, their schedule of supervisory committee meetings aligns with that of other PhD students.

- **First meeting (within 6 months of registration).** The first supervisory committee meeting must take place within six months of initial registration. As with the first MSc meeting, the purpose is to confirm that the project is well-defined and that the student is engaging substantively with the relevant literature.
- **Qualifying examination (9 to 12 months).** Direct-entry PhD students must defend a research proposal at a qualifying examination held at approximately nine months, and no later than twelve months, after initial registration. The qualifying examination is governed by separate guidelines.
- **Comprehensive exam (18 to 20 months).** Following the qualifying examination, the student proceeds to the PhD comprehensive examination at 18 to 20 months, governed by separate guidelines. Thereafter the student meets with the supervisory committee at least once per year.

The Committee Report

The student must prepare a written report and circulate it to all committee members at least one week before the meeting. The body of the report should be approximately 10 pages, double-spaced and typewritten. The page count excludes the title page, abstract, figures, and references. The report should include:

- An abstract of no more than 250 words.
- A brief introduction to the project.
- An overview of completed work and work in progress.
- A description of planned future experiments.
- A coursework summary listing courses completed, in progress, and planned, with sufficient detail to confirm that the student is on track to meet program course requirements.

Work completed since the previous meeting should be clearly identified so that the committee can readily assess recent progress. References should follow the format used by ACS Chemical Biology. Standards for data presentation should match those expected in peer-reviewed journals: gel lanes labelled, plate strains identified, micrographs clearly annotated, graphs with appropriate error bars, and so on.

The closing section of the report should set out the goals the student intends to address before the next meeting. A detailed description of every technique is not necessary; the aim is to articulate the scientific questions being pursued and to outline the general approach.

The Committee Meeting

At the start of the meeting, the student gives a 15 to 20 minute presentation covering the rationale of the project, the experimental approaches in use, an overview of progress and ongoing work, and intended future directions. The committee then discusses the project in detail with the student.

Committee members typically interrupt the presentation to ask questions about any aspect of the work, including the interpretation of data, underlying principles, and questions relevant to planned experiments. Members may also ask the student to briefly explain any of the references cited in the report. Students should bring the lab notebooks containing the relevant experimental observations to the meeting, since reproducibility of key observations is an important part of the discussion.

Students are encouraged to raise any issues on which they would like guidance. When results have been largely negative despite competent and well-controlled work, the meeting can serve as a constructive opportunity for the student and committee to evaluate whether to continue or to redirect a line of investigation.

Grading and Possible Outcomes

Following each meeting, the committee assigns one of four grades:

- Exceeds Expectations (EE)
- Meets Expectations (ME)
- Requires Follow-up (RF)
- Does Not Meet Expectations (DNM)

Students receive a written grade together with specific recommendations following each meeting. Note that achieving the grade of Requires Follow Up (RF) or Does Not Meet Expectations (DNM), requires an additional meeting within a shortened time. If a student receives a RF, areas for improvement must be provided in Part C of the supervisory committee report with a graded meeting to occur within 5 months. If the Student does not receive Meets Expectations (ME) or Exceeds Expectations (EE) at the subsequent meeting, they will be Required to Withdraw.

Note. A student whose work is unsatisfactory may at any time be required to withdraw from the program. Consistent with the Faculty of Science framework, failure of a milestone is reviewed by the program and, where applicable, by the Associate Dean, Graduate Studies, and may result in withdrawal.

MSc-to-PhD Transfer and PhD Qualifying Examinations

CHEMICAL BIOLOGY GRADUATE PROGRAM

Ph.D. Transfer & Qualifying Examinations

Guidelines for Doctoral Candidates and Advisory Committees

The Transfer Examination (for M.Sc. students seeking direct entry to the Ph.D. program) and the Qualifying Examination (for students admitted directly to the Ph.D. with a prior M.Sc. degree) serve the same fundamental purpose: to assess whether a student has the scientific readiness, command of the relevant literature, research skills, and structured plan required to complete a Ph.D. project on time. Both exams use the same written report format and oral examination structure. The key differences in timing and context are noted throughout these guidelines.

The written proposal for both exams is a project-centred document. It is not a broad literature review. Students must demonstrate a focused understanding of the impact and rationale for their research, identify a clear gap in the literature that the project addresses, articulate a testable hypothesis, present results to date with the aims and methods behind them, and lay out a realistic and well-reasoned plan for completing the Ph.D., including a timeline and course plan.

Who This Document Is For

TRANSFER EXAMINATION

For students who:

- Entered the CBGP as an M.Sc. student
- Wish to transfer directly into the Ph.D. program without completing the M.Sc. thesis

Timing:

No earlier than 12 months and no later than 22 months after initial M.Sc. registration. Transfers will not be permitted beyond Term 6.

QUALIFYING EXAMINATION

For students who:

- Hold an M.Sc. from another institution
- Were admitted directly to the CBGP Ph.D. program

Timing:

Approximately 9 months after initial Ph.D. registration and no later than 12 months.

At a Glance

	Transfer Examination	Qualifying Examination
Who	M.Sc. students in the CBGP seeking direct Ph.D. entry	Direct-entry Ph.D. students (M.Sc. from another institution)
Timing	12–22 months after M.Sc. registration (no later than Term 6)	~9 months after Ph.D. registration; no later than 12 months
Written Report	Max. 20 pages, double-spaced, 12-pt font (excl. figures & references)	Max. 20 pages, double-spaced, 12-pt font (excl. figures & references)
Submission	At least one week before the examination date	At least one week before the examination date
Presentation	15–20 minutes	15–20 minutes
Question Period	Up to 2 hours; at least 2 rounds per committee member	Up to 2 hours; at least 2 rounds per committee member
Committee	At least 3 members, including the supervisor. One member other than the supervisor serves as Chair. In exceptional circumstances (e.g., conflicts of interest), a fourth member may serve as Chair at the student's or supervisor's request.	At least 3 members, including the supervisor. One member other than the supervisor serves as Chair. In exceptional circumstances (e.g., conflicts of interest), a fourth member may serve as Chair at the student's or supervisor's request.
Grading	Proceed to Ph.D. / Adjourn for revision / Do not proceed	Proceed / Adjourn for revision / Do not proceed
Re-examination	Must be held no later than 24 months after first M.Sc. registration	Must be held within the 12-month window

1. Goals of the Examination

Both the Transfer and Qualifying examinations evaluate whether the student is ready to pursue a Ph.D. project through to completion. Specifically, the examination assesses:

- Whether the student has a working command of the relevant literature, understands the impact and scientific rationale for their research, can identify the key gap that motivates the project, and can articulate a compelling hypothesis.
- Whether the student's objectives are well-defined, feasible as individual projects, and collectively sufficient to constitute a Ph.D. thesis.
- Whether the student has made meaningful research progress to date and can demonstrate the skills needed to execute the proposed work.

- Whether the student has a realistic, well-reasoned plan, including a timeline and course requirements, for completing the Ph.D. degree on time.

> **Focus: Readiness to complete a Ph.D. on time**
> These exams are not primarily tests of encyclopaedic knowledge. They are structured assessments of scientific thinking, research capability, and planning. The committee's central question is: does this student have the foundation in the literature, the practical research skills, the project, and the plan to successfully complete a Ph.D. within the expected timeframe?

2. Written Report

The written report must be submitted to all committee members at least one week before the examination date. It must represent the student's own original work; the inevitable input of the supervisor notwithstanding, McMaster's Academic Ethics and Academic Dishonesty policies apply in full.

Format

- Maximum 20 pages, double-spaced, 12-point Arial font.
- Figures, tables, and references are not counted in the page limit.
- An abstract of no more than 300 words should be included and is not counted in the page limit.
- References must be formatted in ACS Chemical Biology style.
- The proposal should follow the structure described below (Introduction → Results to Date → Proposed Work & Completion Plan → Timeline → Course Plan), modelled broadly on the layout of a research operating grant.

Required Sections

Section	Suggested Length	Content
Abstract	*~300 words (excluded from page count)*	A self-contained summary of the research problem, the central hypothesis, the key objectives, and the student's plan for completing the Ph.D. Should convey the significance and feasibility of the project in clear language.
Introduction: Impact, Rationale & Hypothesis	*4–6 pages*	This section has three interconnected components that must flow logically into one another: 1. **Impact:** Establish why this research matters. What is the broader scientific or biomedical problem being addressed? Why is it important to solve it now? 2. **Rationale:** Describe the current state of the field as it relates directly to the student's project. What is known? What are the key gaps or limitations in existing work that this project is designed to address? This is not a comprehensive literature review but a targeted, critical account of the scientific context that directly motivates the hypothesis. 3. **Hypothesis:** State the central hypothesis of the thesis project clearly and explicitly. The hypothesis must be testable, specific, and flow directly from the rationale presented above.
Results to Date	*5–7 pages*	Describe the research conducted to date, organised around the objectives or aims that have been addressed. For each objective covered: • State the objective and the experimental approach used. • Present the key data and findings. • Discuss the significance of the results and how they support the hypothesis. For Transfer Examination students, this section covers work completed during the M.Sc. phase; results obtained prior to transfer may be incorporated into the Ph.D. thesis. The committee will use this section to assess the student's research skills and readiness to carry out the proposed future work.
Proposed Work & Completion Plan	*5–7 pages*	Describe the work remaining to complete the Ph.D., organised around the objectives or aims still to be pursued. For each remaining objective: • State the objective and its relationship to work already completed. • Describe the experimental approach and methodology. • State the expected outcomes and how they will advance or test the central hypothesis. • Identify potential pitfalls and describe contingency plans.

Section	Suggested Length	Content
		Objectives may build on one another progressively; they should together be achievable within the expected Ph.D. timeframe and collectively sufficient to constitute a thesis.
Timeline	*1 page (table or figure format recommended)*	Provide a projected timeline for completing the Ph.D., presented as a Gantt chart or equivalent table. The timeline must: • Map each objective to a specific period. • Identify major milestones (e.g., manuscript submissions, committee meetings, comprehensive exam if not yet completed, thesis writing). • Show a realistic path to degree completion within the funded period. The timeline should be honest about current progress and reflect awareness of the time required for each phase of work.
Course Plan	*~0.5 page*	List all courses required for the Ph.D. degree and their status: • Completed: list the course name, term completed, and grade received. • In progress: list the course name and expected completion date. • Planned: list the course name and the term in which the student intends to complete it. If all required courses have been completed, this section should state that explicitly. The supervisory committee may recommend additional courses; any such recommendations should be noted here.
References	*No page limit*	All references cited in the proposal, formatted in ACS Chemical Biology style.

3. Writing a Strong Hypothesis

A clear, testable hypothesis is the cornerstone of the written report and the examination. The hypothesis should:

- Be stated as a single, explicit declarative sentence (or two at most).
- Identify the key variable, mechanism, or relationship under investigation.
- Be falsifiable: it must be possible, in principle, to design experiments that would disprove it.
- Flow directly and logically from the rationale presented in the introduction.
- Be of sufficient scope to motivate a Ph.D.-level body of work, but specific enough to be testable within a realistic timeframe.

4. Guidance on the Timeline Section

The timeline is a practical planning document, not an optimistic aspiration. A well-constructed timeline demonstrates that the student has thought carefully about the scope of the remaining work and has a realistic path to completion. The committee will probe the assumptions underlying the timeline during the question period.

What a Strong Timeline Includes

- A row or entry for each objective, showing the start and anticipated end date.
- Milestones for manuscript preparation and submission, where applicable.
- Scheduled supervisory committee meetings (at minimum annually for Ph.D. students).
- A thesis writing period. Students consistently underestimate the time required for this phase; a minimum of three to four months should be reserved.
- Any remaining course requirements, with the term in which they will be completed.

Example Timeline Structure

Item	Description / Milestones	Target Period
Objective 1	Experimental work, data analysis, manuscript preparation	Months 1–12
Objective 2	Experimental work, data analysis, manuscript preparation	Months 8–20
Objective 3	Experimental work, data analysis	Months 18–28
Coursework	CHEMBIO 700A/B (if not yet complete) + any additional required courses	As scheduled
Committee meetings	Annual supervisory committee meetings (Ph.D. level)	Months 12, 24, 36
Thesis writing	Writing, supervisor review, revisions	Months 28–32
Thesis defence	Oral examination	Month ~34

Note: The example above is illustrative only. The student's actual timeline should reflect the specific structure of their project, the progress already made, and a realistic assessment of the work remaining. The committee will evaluate whether the timeline is credible and whether the student has demonstrated awareness of the time demands of each phase.

5. Oral Presentation

The oral presentation should be 15 to 20 minutes in length. It must mirror the structure of the written report, allowing the committee to assess the student's ability to communicate their project clearly and to defend their scientific decisions in real time.

Expected Structure

- **Impact, rationale and hypothesis (~5 minutes):** Establish why the research matters, what the current state of the field is with respect to this project, and what the central hypothesis is. The committee will assess whether the student can convey the significance and logic of their project concisely and convincingly.
- **Results to date (~5 minutes):** Present the key findings organised around the aims addressed so far. Connect results to the hypothesis and to the proposed future work. Demonstrate that meaningful progress has been made and that the skills required for the remaining work are in place.
- **Proposed work and completion plan (~5 minutes):** Walk the committee through the remaining objectives and how they build on work already completed. Emphasise the logic and feasibility of the overall approach and how the aims together will allow the student to test the central hypothesis and complete the thesis. Avoid trying to describe every experiment in detail.
- **Timeline and course plan (~3 to 5 minutes):** Summarise the projected timeline and course status. The committee will use this portion to assess the realism of the proposed path to degree completion.

6. Question Period

Following the presentation, the committee will conduct a structured question-and-answer session. The Chair will oversee at least two rounds of questions from each committee member. The total question period will not exceed two hours.

Scope of Questions

Questions will centre on the submitted proposal and presentation and may cover any of the following:

- The scientific rationale and impact of the research: why does this matter, and why now?
- The clarity and testability of the hypothesis.
- The design, feasibility, and expected outcomes of each objective.
- The interpretation and significance of preliminary results.
- Potential pitfalls in the proposed work and the quality of contingency plans.
- The realism of the proposed timeline and the student's awareness of the demands of each project phase.
- Fundamental scientific concepts and techniques directly relevant to the proposed work.

Note on the scope of questioning

Unlike the Ph.D. Comprehensive Examination, the Transfer and Qualifying examinations do not require the committee to pre-designate formal areas of fundamental knowledge. Questioning on scientific fundamentals should be directly connected to the proposed work and the techniques the student intends to use.

Students should expect thorough questioning and follow-up. A correct answer will often be pursued with a more challenging continuation. It is expected that students will encounter some questions they cannot fully answer; what matters is that they demonstrate clear scientific reasoning, an honest understanding of the limits of their knowledge, and the ability to think constructively under pressure.

7. Examination Committee

- The examination committee must have at least three members, including the student's supervisor.
- One committee member other than the supervisor serves as Chair of the examination. In exceptional circumstances (e.g., conflicts of interest), a fourth committee member may serve as Chair at the student's or supervisor's request.
- The Chair ensures the examination is conducted fairly and in keeping with these guidelines.
- If a student is unable to answer a particular question, the Chair may ask the examiner for clarification or to move to a more productive line of questioning.
- All committee members hold voting privileges.

8. Possible Outcomes

After the examination, the Chair will inform the candidate and the Program Director of the committee's decision. The committee may recommend one of the following outcomes:

Outcome	Meaning
Proceed to Ph.D. studies	The student has demonstrated the scientific readiness, research capability, and planning required to pursue a Ph.D. project to completion. Transfer becomes effective on the next available date: September 1, January 1, or May 1.
Proceed with Ph.D. following M.Sc. completion	(Transfer Exam only) The student should complete the M.Sc. degree before being reclassified as a Ph.D. student.

Adjourn for revision and re-examination	Deficiencies have been identified that the committee believes can be addressed in a timely manner. The student will receive a written account of the specific concerns. The committee must reconvene for re-examination. For Transfer Exam students: no later than 24 months after first M.Sc. registration. For Qualifying Exam students: within the 12-month window.
Do not proceed to Ph.D.	The student does not demonstrate the readiness required for Ph.D. studies. Transfer Exam students will complete the M.Sc. degree; Qualifying Exam students will not continue in the Ph.D. program.

9. Procedural Requirements & Timeline

Requirement	Details
Exam scheduling	The student contacts the supervisory committee and finds a suitable time for the exam date. The exam must be held within the timing windows specified above.
Written report submission	The student submits the complete written report to all committee members at least one week before the examination date.
Outcome communication	The Chair informs the student and Program Director of the decision immediately following deliberation.
Transfer effective dates	Transfers to Ph.D. status take effect on September 1, January 1, or May 1 only.

10. Guidance for Committee Members

The following principles support consistent and fair implementation of these examinations.

Before the Examination

- Read the written report carefully before the exam. Written feedback is encouraged and should be provided to the student regardless of outcome.
- Prepare questions that probe the student's genuine scientific understanding and their awareness of the practical demands of the proposed work.
- Questions on scientific fundamentals should be directly connected to the proposed project and the techniques the student intends to use.

During the Examination

- Evaluate whether the student's hypothesis is clear, testable, and well-motivated.
- Assess whether the proposed objectives are individually achievable and collectively sufficient for a Ph.D. thesis.
- Pay particular attention to the proposed timeline and course plan. Is the student's path to degree completion on time realistic?
- Rigorous questioning is appropriate and expected; adversarial questioning is not. The goal is to assess readiness, not to intimidate.

After the Examination

- Deliberate privately and arrive at a decision using the outcome categories in Section 8.
- If adjourning for revision, provide the student with a clear, specific written account of the deficiencies to be addressed and the format of the re-examination.

11. Guidelines on the Use of Generative AI

Guidelines on the Acceptable Use of Generative AI

Generative AI tools (e.g., ChatGPT, Gemini, Copilot) are powerful resources, but the Transfer/Qualifying Examinations are fundamentally assessments of your scientific independence, critical synthesis of the literature, and ability to conceive original research. Therefore, the use of generative AI is permitted only under strict, clearly defined conditions.

Permitted Uses (Editing and Formatting)

- Proofreading: You may use AI tools to check grammar, spelling, and sentence flow. The tools should act as a copyeditor, not a co-author.
- Formatting: AI may be used to format reference lists (e.g., into ACS Chemical Biology style), structure tables, or assist with document layout.

Prohibited Uses (Content and Idea Generation)

- Drafting Text: You may not use AI to write substantive portions of your literature review, summary of results, or research proposal.
- Idea Generation: AI must not be used to identify gaps in the literature, formulate your central hypothesis, or design your experimental aims. The conceptual framing and scientific narrative must originate with you.
- Literature Summarization: Relying on AI to read and summarize primary literature bypasses the critical evaluation required to pass this milestone. You must read and synthesize the primary literature yourself.

Disclosure and Accountability

- Mandatory Declaration: If you use generative AI for any permitted purpose, you must include a brief "Declaration of AI Use" section at the end of your report (prior to the references) stating which tools were used and specifically how they were applied (e.g., "ChatGPT-4 was used to proofread the document for grammatical errors").

- Full Responsibility: You are entirely responsible for the scientific accuracy, integrity, and originality of your submission. AI-generated hallucinations, factual errors, or plagiarized text will be treated as academic misconduct.
- Data Security Warning: Do not upload unpublished preliminary data, novel hypotheses, or proprietary laboratory information into public AI models, as this may compromise future intellectual property or publication rights.

Questions about these guidelines should be directed to the Program Director or Associate Director of the Chemical Biology Graduate Program.
chembio@mcmaster.ca

PhD Comprehensive Examination

CHEMICAL BIOLOGY GRADUATE PROGRAM

Ph.D. Comprehensive Examination

Guidelines for Doctoral Candidates and Advisory Committees

The Comprehensive Examination is a capstone milestone in the Ph.D. program. It assesses a student's command of their field, the quality of their original research contributions to date, and the scientific impact and feasibility of their proposed path to thesis completion. The format centres on a substantial Literature Review and Fundamentals section that establishes the current state of the art and the conceptual foundations of the project, followed by a focused Research Proposal centred on the student's own work and clearly demonstrating its impact on the field.

At a Glance

Component	Details
Timing	18 to 20 months after entry into the Ph.D. program, and no later than 24 months
Written Report	Literature review & fundamentals central to thesis (10–12 pp.) + key results to date + focused research proposal (max. 20 pages total not including figures)
Presentation	~20 minutes covering research context, original contributions, and future directions
Question Period	Structured Q&A on the written document, presentation, and at least three designated fundamental areas
Grading	Pass with Distinction / Pass / Fail
Committee	Three Chemical Biology faculty; one member serves as Chair (cannot be the supervisor). In exceptional circumstances, a fourth person may serve as Chair at the student's or supervisor's request.
Re-Examination	Cannot exceed 6 months after the date of the first examination; second failure requires withdrawal from the Ph.D. program

1. Goals

The Comprehensive Examination serves three purposes:

- To evaluate the student's depth of knowledge in their specific research area and in fundamental areas of Chemical Biology relevant to their thesis as designated by their committee.
- To assess the quality of original research contributions made to date and the student's ability to contextualise them within their field.
- To evaluate the feasibility and scientific rigour of the proposed plan for thesis completion, including the student's capacity to conceive and develop independent scientific ideas.

Why this format?

A substantial literature review is the foundation of rigorous doctoral research. By requiring students to clearly define the current state of the art and the fundamental principles underpinning their project, the Comprehensive Examination ensures they have developed genuine expertise in their field before committing to a thesis trajectory. The accompanying research proposal then demonstrates that they can translate that expertise into a compelling scientific case for the impact of their proposed work, and that they can independently extend their research into new directions beyond the guidance of their supervisor.

Submission Deadline

The written report must be received by all committee members no later than one week (7 calendar days) before the scheduled examination date. This deadline is firm.

Consequences of Missing the Submission Deadline

If the written report is not received by all committee members by the one-week deadline, the scheduled examination (presentation and question period) will be cancelled. A new date will be arranged once a revised submission is ready, subject to the availability of all committee members. Students should anticipate that rescheduling may take several weeks and should plan accordingly.

Students are strongly encouraged to build a buffer of at least two to three days into their writing schedule to accommodate final review and formatting.

2. Written Report: Literature Review, Preliminary Results & Research Proposal

The written report has three parts: a substantial review of the current literature and fundamentals of the field, a summary of preliminary results, and a focused student-conceived research proposal. Together these demonstrate that the student has mastered the scientific context of their work, can articulate a compelling case for their thesis, and can conceive of new research directions independently.

Format and Length

- Maximum 20 pages, double-spaced, 12-point Arial font, not including figures, tables, or references.
- At least 60 pertinent references must be included, formatted in ACS Chemical Biology style.
- The proposal must be the student's original work, developed independently and without external guidance from supervisors or committees. All submissions are subject to McMaster's Academic Ethics and Academic Integrity policies.

Students requiring accommodations (e.g., extra time) should submit a written request to the committee in advance of the examination. Requests will be evaluated on a case-by-case basis.

Required Sections

Section	Suggested Length	Content
Abstract	*~300 words (not counted in page limit)*	Concise summary of the field, the key gap being addressed, preliminary findings, and the proposed research. Should stand alone as a clear articulation of the project.
Literature Review & Fundamentals	*10–12 pages*	The core of the written report. Students must: **1.** Define the current state of the art in their field, citing and critically evaluating the primary literature. **2.** Identify the key unresolved questions or limitations that motivate their thesis project. **3.** Explain the fundamental chemical, biochemical, and/or biological principles underpinning their experimental approach. This section should demonstrate genuine command of the field, not merely a catalogue of papers. It may serve as a foundation for the introductory chapter of the thesis.
Summary of Key Results to Date	*2–3 pages*	Describe the original research conducted to date. Present key data concisely, highlight the significance of findings, and connect results directly to the unresolved questions identified in the literature review. This section demonstrates that the

Section	Suggested Length	Content
		student has made meaningful progress and is prepared to pursue the proposed future work.
Research Proposal	*4–6 pages*	A focused proposal for the remaining thesis work, centred on the student's own contributions and demonstrating their impact on the field. Students must: **1.** Clearly state the specific aims. **2.** Articulate the impact of the proposed work and explain how it will advance the field beyond the current state of the art. **3.** Describe the experimental approaches for each aim. **4.** Identify potential pitfalls and contingency plans. **5.** Provide a projected timeline. The emphasis should be on scientific impact and the logic of the experimental design, not exhaustive procedural detail. The proposal must be the student's original work, developed independently and without external guidance from supervisors or committees.
References	*No page limit*	All references cited, in ACS Chemical Biology format. A thorough literature review is expected to include a substantial and representative reference list.

Additional Guidance on the Research Proposal

This component is intended to give students the opportunity to demonstrate scientific independence and ownership over the direction of their doctoral research.

Scope and Purpose

- The proposal should extend naturally from the student's current research. Rather than being entirely disconnected from ongoing work, it should be a logical next step that the student sees as a meaningful scientific question worth pursuing.
- The work proposed is envisioned as the basis for a chapter of the thesis, driven primarily by the student's own scientific initiative.
- Students are expected to develop this proposal on their own. Discussion with peers, committee members, or the broader literature is welcomed and encouraged; however, the conceptual framing, choice of direction, and experimental design should originate with the student rather than the supervisor.
- The supervisor should be aware that the student is developing this section, but should not direct its content. Committee members may be consulted for general guidance on feasibility or relevant techniques.

What the committee is looking for

- Evidence that the student can identify a meaningful scientific question on their own.
- A clear rationale connecting the proposed project to the broader thesis narrative and to open questions in the field.
- A realistic experimental plan, including at least a preliminary consideration of feasibility, required resources, and potential pitfalls.
- Intellectual ownership: the student should be able to explain and defend every element of this proposal during the question period.

3. Oral Presentation

The oral presentation should be approximately 20 minutes in length and must reflect the structure of the written report. Students should assume the committee has read the document; the goal is not to reproduce it but to guide the committee through the key ideas, highlight the most significant findings, and make a compelling case for the impact of the proposed work.

Expected Structure

- **State of the art and fundamentals:** Establish the current landscape of the field and the key unresolved question(s) the thesis addresses. Demonstrate command of the relevant literature and the underlying scientific principles. This section sets the stage for everything that follows and should be substantive, not a rushed preamble.
- **Key results to date:** Present the most significant original data generated to date. Focus on what the results mean in the context of the state of the art established above, and how they demonstrate readiness to pursue the proposed work.
- **Research proposal and impact:** Present the specific aims and make a clear, direct case for how the proposed work will advance the field beyond its current state. Emphasise scientific impact, feasibility, and the logic of the experimental design.
- **Summary:** Articulate the overall significance of the thesis project and its expected contribution to Chemical Biology.

Expectations for the literature and fundamentals portion

A strong command of the state of the art is a central evaluation criterion of this examination. Students are expected to present a critical and synthetic understanding of the field, not a descriptive list of studies. The committee will probe this knowledge during the question period and will assess whether the student can situate their own contributions meaningfully within the broader scientific landscape.

4. Question Period

The total examination runs approximately two hours. Following the 20-minute oral presentation, the committee will conduct a structured question-and-answer session consisting of two rounds of questions from each of the three committee members, with each round lasting no more than 15 minutes per examiner.

Area 1: The Written Report and Presentation

Committee members may ask about any aspect of the submitted report or the oral presentation, including the rationale for experimental choices, interpretation of preliminary data, anticipated pitfalls, and alternative approaches.

Area 2: Designated Fundamental Areas

Prior to the examination, the committee will formally identify at least three fundamental areas of Chemical Biology that are directly relevant to the student's project. Students will be expected to demonstrate a high degree of understanding in each designated area.

Committee Responsibility: Communicating Fundamental Areas

- The committee must communicate the designated areas to the student in writing at least four weeks before the examination date.
- Each area must be described in sufficient detail for the student to prepare effectively (see examples in Section 9).
- Areas should reflect genuine competencies required to carry out and contextualise the proposed Ph.D. research.
- Three areas is a minimum; more may be designated for highly interdisciplinary projects.

Students should expect rigorous follow-up questioning. A correct answer will often be followed by a more challenging continuation to probe the depth of understanding. It is expected that students will encounter some questions they cannot fully answer; what matters is demonstrating clear scientific reasoning and sound thinking under pressure.

5. Examination Committee

- The committee consists of three faculty members from the Chemical Biology Graduate Program.
- One member serves as Chair. The Chair may not be the student's supervisor. In exceptional circumstances, a fourth person may serve as Chair at the student's or supervisor's request.
- The Chair ensures the examination is conducted fairly, may ask for clarification of questions, and oversees the question rounds.

Responsibilities of the Chair

- Ensure the examination is conducted fairly and in accordance with these guidelines.
- Moderate the question period, keeping discussion on track and intervening if a line of questioning becomes unproductive.
- Lead the committee's deliberation after the exam and communicate the outcome to the student and the Program Director.

6. Grading

The committee will deliberate privately following the question period and arrive at one of the following outcomes:

Outcome	Criteria
Pass with Distinction	The student demonstrates exceptional mastery of the research field and fundamental areas, presents compelling and well-contextualised original data, and proposes a rigorous and clearly feasible plan for thesis completion.
Pass	The student demonstrates adequate command of their research context and fundamental areas, presents satisfactory original contributions, and outlines a credible plan for thesis completion. Minor deficiencies may be noted in writing.
Fail	The student demonstrates significant gaps in the designated fundamental areas, presents an inadequately supported set of key results, or proposes a plan that lacks scientific rigour or feasibility.

7. Re-Examination

- If a re-examination is required, it cannot exceed 6 months after the date of the first examination. The exact format will be determined by the committee based on the deficiencies identified. This may require additional coursework, a revised written document, or a full re-sitting.
- A second failure will necessitate withdrawal from the Ph.D. program.

8. Timeline and Procedural Requirements

Milestone	Requirement
Exam scheduling	Normally completed between 18 and 20 months after entry into the Ph.D. program, and no later than 24 months.
Designation of fundamental areas	Shortly after scheduling the exam, the committee provides the student with a written list of at least three fundamental areas in which a high degree of understanding is expected.
Written report submission	The student submits the written report to all committee members at least one week prior to the examination.
Examination day	~20-minute presentation followed by two rounds of questions from each committee member (15 minutes per examiner per round). Total examination runs approximately two hours.
Outcome communication	The Chair informs the student and Program Director of the committee's decision immediately after deliberation; written feedback will be provided to the student within one week.

9. Guidance for Advisory Committee Members

The following principles support consistent and fair implementation of the revised Comprehensive Examination across the program.

Designating Fundamental Areas

- Choose areas genuinely foundational to the student's specific project, not general gatekeeping topics.
- Frame each area clearly enough that the student can direct their preparation effectively.
- At least three areas must be designated; four or five may be appropriate for highly interdisciplinary projects.

Examples of well-framed fundamental areas:

- "Mechanisms of covalent and non-covalent enzyme inhibition, with emphasis on the target class being studied."
- "Principles of solid-phase peptide synthesis and common protecting group strategies relevant to the synthetic approach being used."

- "Cell signalling pathways downstream of your target receptor, including known crosstalk and feedback mechanisms."
- "Pharmacokinetic and pharmacodynamic principles relevant to the compound class being developed, including ADME considerations."
- "Statistical approaches for the analysis and interpretation of the primary data type in this project."

Evaluating the Report

- Read the report critically but with the expectation that the student is still developing as an independent scientist. The standard is rigour and feasibility, not perfection.
- Written annotations or a brief written summary of feedback are encouraged, regardless of outcome.

Conducting the Question Period

- Questions should probe genuine understanding, not memory recall.
- If a student is unable to answer a question, the Chair may ask the examiner for clarification or to move to a different line of questioning.
- The purpose of the exam is to assess and constructively identify areas for development. Questioning should be rigorous but not adversarial.

10. Guidelines on the Use of Generative AI

Guidelines on the Acceptable Use of Generative AI

Generative AI tools (e.g., ChatGPT, Gemini, Copilot) are powerful resources, but the Comprehensive Examination is an assessment of your scientific independence, critical synthesis of the literature, and ability to conceive original research. Therefore, the use of generative AI is permitted only under strict, clearly defined conditions.

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- Proofreading: You may use AI tools to check grammar, spelling, and sentence flow. The tools should act as a copyeditor, not a co-author.
- Formatting: AI may be used to format reference lists (e.g., into ACS Chemical Biology style), structure tables, or assist with document layout.

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- Drafting Text: You may not use AI to write substantive portions of your literature review, summary of results, or research proposal.
- Idea Generation: AI must not be used to identify gaps in the literature, formulate your central hypothesis, or design your experimental aims. The conceptual framing and scientific narrative must originate with you.

- Literature Summarization: Relying on AI to read and summarize primary literature bypasses the critical evaluation required to pass this milestone. You must read and synthesize the primary literature yourself.

Disclosure and Accountability

- Mandatory Declaration: If you use generative AI for any permitted purpose, you must include a brief "Declaration of AI Use" section at the end of your report (prior to the references) stating which tools were used and specifically how they were applied (e.g., "ChatGPT-4 was used to proofread the document for grammatical errors").
- Full Responsibility: You are entirely responsible for the scientific accuracy, integrity, and originality of your submission. AI-generated hallucinations, factual errors, or plagiarized text will be treated as academic misconduct.
- Data Security Warning: Do not upload unpublished preliminary data, novel hypotheses, or proprietary laboratory information into public AI models, as this may compromise future intellectual property or publication rights.

Questions about these guidelines should be directed to the Program Director or Associate Director of the Chemical Biology Graduate Program.
chembio@mcmaster.ca

MSc Thesis Defence

CHEMICAL BIOLOGY GRADUATE PROGRAM

MSc Thesis Defence

The MSc thesis defence is the culminating examination of the Master's program. It evaluates whether the candidate has produced original research at a level appropriate for the MSc degree and has the depth of understanding to communicate and defend that work. This section applies to candidates in both the traditional and Accelerated MSc pathways.

At a Glance

Component	Requirement
Permission to write	Granted at the supervisory committee meeting where the student requests it (often the third meeting at 18 to 20 months for traditional MSc; third meeting by month 10 for Accelerated MSc).
Examining committee	At least three members: the two-member supervisory committee (including the supervisor) and a Chair.
Chair	A faculty member who is not the supervisor. The Chair runs the defence and may or may not ask questions.
Presentation	20 minutes, given at the start of the defence.
iThenticate review	Required and approved by the supervisor before the thesis is sent to the examining committee.
Thesis to committee	At least one week before the scheduled defence.
Final submission	Electronic submission to SGS through MacSphere, with required forms, after corrections are approved.

Eligibility and Prerequisites

Before a defence date can be set, the candidate must have received written permission to write from the supervisory committee at the relevant meeting; completed all course requirements for the MSc degree, including CHEMBIO 700A/B and the additional 700-level credit specified for the candidate's pathway; given the required Chemical Biology seminar; completed SGS 101 and SGS 201; and submitted a complete draft of the thesis to the supervisor for formal review. The supervisor reviews the draft and decides whether it is ready for examination; if revisions are required first, the candidate addresses them in consultation with the supervisor before proceeding.

The Examining Committee

The MSc defence is conducted by an examining committee of at least three members: the two members of the supervisory committee (one of whom is the supervisor) and a Chair, who is a faculty member other than the supervisor. This structure applies to both the traditional and Accelerated

pathways. The Chair runs the defence, managing its flow, ensuring fair questioning, and communicating the committee's decision, and may or may not ask questions at their discretion.

iThenticate Originality Review

Before the thesis is sent to the examining committee, it must be reviewed for originality using the University's iThenticate subscription. The supervisor reviews the report and either approves the thesis as ready for examination or recommends revisions. The thesis may not be sent to the committee until the iThenticate report has been reviewed and approved.

Setting Up the Defence

Once the supervisor has approved the thesis as ready, the candidate works with the program office to schedule the examination. The typical sequence is: the candidate requests permission to write at the relevant committee meeting; notifies the program office (chembio@mcmaster.ca) of the intent to defend, with a proposed date and the names of the supervisory committee members (the Chair is appointed by the supervisor); the Graduate Coordinator, acting for the Program Director, sets the official date, time, and location; the candidate completes the thesis and submits it to the supervisor for review; the supervisor reviews the iThenticate report and approves the thesis; the candidate sends the approved thesis to all examining committee members at least one week before the defence; and the defence is held.

The Defence

The defence is an oral examination conducted by the examining committee. The candidate begins with a 20-minute presentation summarising the thesis: the rationale and significance of the project, the experimental approaches used, the principal results, and the conclusions drawn. The supervisory committee members then question the candidate on any aspect of the work, including the interpretation of data, the underlying principles, and the place of the work within the broader field; the Chair manages the flow of questioning and may or may not pose questions. The candidate is expected to demonstrate command of the thesis work, the ability to defend the conclusions drawn, and a working knowledge of the relevant background literature.

Outcomes

Following the questioning, the committee deliberates in private and reaches one of the following outcomes:

- Pass without corrections.
- Pass with minor corrections, to be reviewed and approved by the supervisor.
- Pass with major corrections, to be reviewed and approved by full examining committee.
- Adjournment, where further work is required before a final decision can be made. Conditions for reconvening are communicated to the candidate in writing.
- Fail.

The Chair communicates the outcome after deliberation. Where corrections are required, they must be addressed to the satisfaction of the supervisor (or the committee, where applicable) before the thesis is submitted to the School of Graduate Studies.

Final Submission and Embargo

After a successful defence and approval of all corrections, the candidate submits the final thesis to SGS through the E-Thesis Submission module in MacSphere. The submission must include the final

approved thesis (one electronic copy), the Final Thesis Submission Sheet signed by the supervisor, the Copyright Permission Form where applicable, and the McMaster University Licence. Forms are available from the SGS website, and submission questions may be directed to gthesis@mcmaster.ca. A candidate may request an embargo of up to one year on the public release of the thesis; the title and abstract may still become searchable online during the embargo, which should be considered when planning related publications.

> Candidates and supervisors are encouraged to contact the program office (chembio@mcmaster.ca) early in the planning process to confirm timelines and to flag any unusual circumstances that may affect scheduling.

PhD Thesis Defence

CHEMICAL BIOLOGY GRADUATE PROGRAM

PhD Thesis Defence

The PhD thesis defence is the culminating examination of the doctoral program. It is a University examination, governed by the School of Graduate Studies, and is therefore distinct in scope and procedure from the departmental MSc defence. The defence evaluates whether the candidate has produced original research that contributes to the advancement of knowledge and demonstrates the depth of expertise expected of a doctoral graduate.

At a Glance

Component	Requirement
Permission to write	Granted by the supervisory committee at a regular committee meeting before the defence is scheduled.
Examining committee	The candidate's supervisor and supervisory committee, an external examiner from outside McMaster, and a Chair appointed by the supervisor.
Chair	A University representative appointed by the supervisor, who moderates the defence and ensures protocol is followed. The Chair may pose questions as an audience member but does not serve as a formal examiner.
External examiner	Suggested by the supervisor; selected and arranged by the SGS Thesis Coordinator.
Scheduling timeline	Approximately 8 weeks from the start of the process. An accelerated option may be available in consultation with the supervisor and program.
iThenticate review	Required and approved by the supervisor before the thesis is sent to the examining committee or external examiner.
Presentation	Approximately 15 minutes, and in no case more than 20 minutes, given at the start of the defence. Notes may be used; the presentation may not be read from a prepared script.
Departmental talk	A separate seminar given before the defence, scheduled with the program office.
Final submission	Electronic submission to SGS through MacSphere, with required forms, after corrections are approved.

Eligibility and Prerequisites

Before the scheduling process can begin, the candidate must have received permission to write from the supervisory committee at a regular committee meeting; completed all course requirements for the PhD; passed the comprehensive examination; given or scheduled the required Chemical Biology seminars; completed SGS 101 and SGS 201; and submitted a complete draft of the thesis to the supervisor for formal review. The supervisor reviews the draft and decides whether it is ready for examination; if revisions are required first, the candidate addresses them in consultation with the supervisor.

The Examining Committee

The PhD defence is conducted by an examining committee assembled in accordance with SGS requirements, consisting of the candidate's supervisor, the other members of the supervisory committee, an external examiner from outside McMaster University, and a Chair who is a University representative appointed by the supervisor. The Chemical Biology Graduate Program does not impose composition requirements beyond those set by SGS, other than that the external examiner be external to McMaster. The Chair runs the defence, manages its flow, ensures fair questioning, and communicates the committee's decision, and may or may not pose questions.

iThenticate Originality Review

Before the thesis is sent to the examining committee or the external examiner, it must be reviewed for originality using the University's iThenticate subscription. The supervisor or program reviews the report and either approves the thesis or recommends revisions. The thesis may not be sent to the external examiner or examining committee until the report has been reviewed and approved.

External Examiner

The external examiner is a researcher from outside McMaster with expertise in the candidate's field. The supervisor proposes a list of prospective external examiners approved by the supervisory committee, and the SGS Thesis Coordinator arranges the final selection. The external examiner reviews the thesis in advance and contributes a written report, and may attend the defence in person or remotely.

Setting Up the Defence

Scheduling a PhD defence takes approximately 8 weeks from the start of the process, with an accelerated option available in consultation with the supervisor and the program office. The typical sequence is: the candidate emails the thesis to each member of the supervisory committee; initiates the defence process online through the Mosaic Student Centre, submitting the thesis title and an estimated submission date; the SGS Thesis Coordinator contacts the supervisor and committee to approve the date and confirm the thesis as defensible; the supervisor proposes prospective external examiners to the Thesis Coordinator, who arranges the selection; the supervisor or program reviews and approves the iThenticate report before distribution; the Thesis Coordinator notifies the candidate, supervisor, and committee of the date, time, and location; the candidate, if not already done, contacts the program office to schedule the departmental talk for a date before the defence; and the defence is held.

The Defence

The defence is an oral examination conducted by the examining committee. The candidate begins with a presentation of approximately 15 minutes, and in no case more than 20 minutes. Because the

audience has read the thesis, the presentation should not be a simple summary; it should highlight the candidate's contribution to the advancement of knowledge and the principal technical or theoretical challenges overcome. Notes and other aids may be used, but the presentation may not be read from a prepared script. The presentation is followed by one round of questions and a further round of follow-up questions, as appropriate, from the supervisory committee members, the external examiner, and any additional examiners, covering any aspect of the work, including the interpretation of data, the underlying principles, the broader context of the field, and the implications of the findings. The Chair manages the flow of questioning. The duration of the defence, including the candidate's presentation, will not normally exceed three hours. The candidate is expected to demonstrate command of the thesis work, the ability to defend the conclusions drawn, and the depth of understanding expected of a doctoral graduate.

Departmental Talk

In addition to the defence, the candidate gives a departmental talk in the Chemical Biology seminar program, scheduled before the defence. The departmental talk is an open seminar covering the candidate's thesis work for a broader audience. The candidate contacts the program office (chembio@mcmaster.ca) to arrange a date once the defence has been scheduled.

Outcomes

Following the questioning, the committee deliberates in private and reaches one of the following outcomes:

- Pass without corrections.
- Pass with minor corrections, to be reviewed and approved by the supervisor.
- Pass with major corrections, to be reviewed and approved by the full examining committee.
- Adjournment, where further work is required before a final decision can be made. Conditions for reconvening are communicated to the candidate in writing.
- Fail.

If the examining committee is not satisfied with the candidate's performance, the candidate must retake the defence after completing any thesis revisions recommended by the committee, and must be informed in writing of the conditions to be met for the second and final defence. Where corrections are required, they must be addressed to the satisfaction of the supervisor, or the full committee where applicable, before the thesis is submitted to SGS.

Final Submission and Embargo

After a successful defence and approval of all corrections, the candidate submits the final thesis to SGS through the E-Thesis Submission module in MacSphere. The submission must include the final approved thesis (one electronic copy), the Final Thesis Submission Sheet signed by the supervisor, the Copyright Permission Form where applicable, the Library and Archives Canada Licence, and the McMaster University Licence. Forms are available from the SGS website, and submission questions may be directed to gthesis@mcmaster.ca. A candidate may request an embargo of up to one year on the public release of the thesis; the title and abstract may still become searchable online during the embargo.

> Given the 8-week scheduling window and the coordination required for the external examiner, candidates and supervisors are strongly encouraged to begin the defence process well in

advance of the planned defence date. The program office (chembio@mcmaster.ca) can assist with timeline planning and with scheduling the departmental talk.

Financial Support

Most full-time graduate students in the thesis-based MSc and PhD programs receive financial support in the form of a teaching assistantship and a departmental scholarship; the minimum level of support varies from year to year. Research and departmental scholarships will be paid to you directly via e-transfer, in ONE lump sum two to three weeks into a new term, while teaching assistantship income is paid biweekly during the terms in which the student is a teaching assistant. To receive payments, students must submit their payroll information via the new Employee Self-Service portal in Mosaic.

Program stipend: the minimum departmental support for 2026 to 2027 is $29,029 for MSc students and $31,029 for PhD students. Students can expect at least this minimum for two years (MSc) or four years (PhD); there is no guarantee of support beyond these periods. Students holding external or internal scholarships are usually supported at a higher level, and funding is adjusted at the start of an award. Chemical Biology students also normally receive a teaching assistantship stipend as part of their total support; a teaching assistantship is 130 hours per year, or about five hours per week.

Policy on the Adjustment of Financial Support and Major Scholarships

The Faculty of Science requires each program to maintain a policy on the adjustment of financial support after a student receives a major (competitive) scholarship, and to make that policy available to students. The program's policy follows the Faculty principles below. A major award is one valued at $10,000 or more per year, and includes awards such as OGS, CGS-M, CGS-D, and Vanier.

1. Students are encouraged to apply for additional internal and external funding. To incentivise this, a student who receives a scholarship must be better off financially after receiving the award.
2. Financial support means the totality of program and supervisor contributions, including graduate, research, and departmental scholarships.
3. Reductions following a major award must not reduce the student's teaching assistantship (or research assistantship in lieu) employment, needs-based bursaries, restricted expense-specific awards such as travel awards, or scholarships and bursaries not paid through McMaster.
4. Support is not reduced for awards valued at less than $10,000, and adjustments apply only to departmental and supervisor funding.
5. The total stipend, including the major award, must increase by at least 20 percent of the award's value over the student's prior stipend, and the maximum adjustment cannot exceed the value of the scholarships that form part of the student's offer.
6. In no case may total support fall below the minimum funding value stated in the student's offer of admission.
7. Designated graduate scholarships for Indigenous students are not subject to any funding redistribution, and packages are maintained at their original value. The policy does not apply retroactively and is reviewed yearly.

Teaching Assistantships

Each year the program receives an allocation of teaching assistantships, and a qualified full-time student may be offered one at admission. Continued teaching assistantship support depends on continuous full-time registration in good standing. Teaching assistants are employees of the University, and the terms of employment are governed by the collective agreement between CUPE Local 3906 Unit 1 and the University. First-time teaching assistants must complete five hours of paid mandatory training (covering pedagogy and anti-oppression) within two weeks of their assignment, scoring 100 percent on each module quiz; this is a one-time requirement. A meeting between the supervisor and teaching assistant must be held within seven days of the start of duties to complete the Hours of Work and Performance Expectations forms, which are submitted to the Graduate Administrative Assistant.

Continuity of funding applies as set out in the collective agreement: a full-time MSc teaching assistant employed during part of the first year is normally re-employed during part of one succeeding year, and a full-time PhD teaching assistant is normally re-employed during part of each of the three succeeding years, subject to maintaining full-time status and the ability to perform the work.

Travel Awards and External Awards

The program grants competitive travel awards of up to $1,000 to assist students attending scientific meetings at which they present their own original work as a poster or talk. Students must be enrolled full time, and those who have previously received a travel award are eligible again only if funding permits. Students are encouraged to also seek travel funds from other sources, including the Graduate Students Association. There are three application deadlines each year: March 15 (for meetings between April 1 and June 24), June 15 (for meetings between June 25 and August 31), and September 15 (for meetings between September 1 and March 30). Applications require an abstract and a one-page letter explaining the relevance of the meeting, and are reviewed by the Program Director and the Award Selection Committee. See application at the end of this document for CBGP travel awards.

Students are encouraged to apply for external awards from provincial and national agencies, including the Canada Graduate Research Scholarships (Master's and Doctoral) under the Canada Research Training Awards Suite, and the Ontario Graduate Scholarship. Many opportunities are advertised by email, so students should monitor their McMaster account. If a student holds a major award, the program stipend may be adjusted as described above.

Departmental Awards

Impact Awards (recognition for student publications): presented for highly meritorious contributions to the scientific literature in the year before the award, recognising the most impressive first-authored publication by a graduate student. Nominations take the form of a one-page letter from the supervisor outlining the student's accomplishments and role in the publication, accompanied by a copy of the publication. Up to two awards are anticipated annually.

Chemical Biology Leadership Awards: awarded on three criteria: leadership and interpersonal skills, assessed through citizenship and participation in the program or extracurricular activities (60 percent); academic excellence, gauged through course grades (20 percent); and research potential, gauged through publications (20 percent). The application includes a supervisor's letter addressing leadership, current graduate and undergraduate transcripts, and an updated CV with a list of publications.

Chemical Biology Graduate Student Travel Awards: described under Financial Support above.

Student Life and Resources

McMaster Science Graduate Student Association (SciGSA): brings together graduate students from across the sciences and runs social events throughout the year, including the annual Alumni Social.

Graduate Students Association (GSA): advocates for graduate students and provides services including health and dental coverage, the HSR bus pass, and Empower Me, along with events, clubs, and recreational activities.

Health and dental: the Studentcare health and dental plans cover services beyond a basic health-care plan. Students with a teaching assistantship or research assistantship in lieu are covered under the CUPE 3906 plan and are automatically opted out of the Studentcare dental plan, receiving a reimbursement. Students with alternative coverage can opt out through the Studentcare website by the posted deadlines.

Careers and professional development: the Technical Communications for Graduate Students module on Avenue to Learn builds writing and presentation skills; the McMaster Office for the Development of English Language Learners (MODEL) offers free language support; SGS offers thesis-writing resources; and the Science Careers and Experience Centre runs events, workshops, and one-on-one consultations for careers beyond academia.

Transit: full-time graduate students are entitled to a 12-month unlimited HSR Presto bus pass for the academic year; new students obtain and register the pass following the HSR instructions.

Appendices

Appendix A: One-Year Accelerated MSc in Chemical Biology Pathway

The Accelerated MSc pathway allows eligible McMaster students to complete a research-based MSc in Chemical Biology in an efficient timeline. It builds directly on a student's undergraduate thesis project, carried out with the same supervisor, so that a strong undergraduate researcher can move efficiently into a focused Master's degree. Research expectations are the same as for the traditional MSc pathway; the accelerated pathway compresses the timeline rather than the scope of the research.

> **Rationale**
> The accelerated pathway offers an early option for entering the workforce, can serve as a route toward the MD/PhD program, and is distinctive as a research-intensive one-year graduate degree. The traditional two-year MSc pathway, and the option to transfer to the PhD program, remain available to accelerated students whose circumstances call for them.

Eligibility

The accelerated option is available to students currently enrolled at McMaster University in one of the following programs, who can complete the degree in twelve months of full-time study:

- Honours Chemical Biology
- Honours Biochemistry and Biomedical Sciences (BBS)
- Honours Co-op Chemical Biology
- Honours Co-op BBS

Applicants must have a sessional average of 10.0 (GPA 10 or higher) at the time of applying. Exceptions must be approved by the supervisor, the Program Director, and the Associate Dean. Students must complete CB 4G12 or an equivalent undergraduate thesis course (for example, BBS 4T15) with their proposed supervisor during their undergraduate degree; alternative courses may be permitted with the approval of the supervisor and the Program Director. Students are expected to begin the program in the May or September immediately following completion of their BSc.

Application Process

Students apply in mid-November of Level IV (Honours Chemical Biology and BBS graduates) or Level V (Honours Co-op Chemical Biology and BBS graduates), for admission in the following May or September. The application deadline for 2025 to 2026 admission is November 21, 2025. Applicants follow the normal application procedures of the School of Graduate Studies and must meet the requirements of both the Chemical Biology Graduate Program and the School of Graduate Studies. The application requires:

- A description of the proposed undergraduate thesis project (for example, CB 4G12 or BBS 4T15) and of the proposed Accelerated MSc project, as approved by the supervisor.
- The approval and signature of the proposed supervisor.
- A statement of interest in pursuing graduate studies.

- Where appropriate, an additional sheet detailing previous research, teaching, or work experience related to the proposed area of specialization.

Scholarships: accelerated students may apply for scholarships, normally by early December. A teaching assistantship is included (130 hours per year, or a research assistantship in lieu if bought out).

Degree Requirements

A candidate for the Accelerated MSc spends at least one calendar year in full-time study at McMaster University and is required to:

1. Complete CHEMBIO 700A/B (CB 700), delivered as a two six-week modules.
2. Complete an additional three units at the 700 course level: either CHEMBIO 702 (by submitting a detailed review of the research field to the supervisory committee) or an alternative 3-unit course, or two 1.5-credit 700-level courses, may be permitted in lieu with the approval of the supervisor, the Program Director, and the Associate Dean of the Faculty.
3. Give a seminar at the Chemical Biology Graduate Colloquium in April.
4. Present a thesis embodying the results of original research, and defend it in an oral examination.

No double counting: results from the undergraduate thesis course (CB 4G12 or BBS 4T15) may not be included in the Accelerated MSc thesis.

Supervisory Committee Meetings

Accelerated MSc students follow a compressed schedule of supervisory committee meetings. The committee consists of at least two members: the supervisor and one additional faculty member whose scholarly interests include the student's area of research.

- **First meeting (within 2 months of registration).** Confirms that the project is well-defined and that the student is engaging substantively with the relevant literature. Because accelerated students enter from an undergraduate thesis project with the same supervisor, this meeting also confirms the planned research trajectory for the MSc.
- **Second meeting (by 6 months; advised but optional).** May be held by the six-month mark to review progress and address any issues. This meeting is encouraged but not required.
- **Third meeting (by 10 months).** Permission to write the MSc thesis is typically requested here. The student should be prepared to demonstrate that the body of work is sufficient for a Master's thesis, with enough time remaining to write and defend by the end of the twelfth month.

Thesis Submission and Defence

Permission to write is normally requested at approximately the tenth month. The process follows the traditional MSc pathway as described in the handbook.

Option to Transfer to the PhD Program

Accelerated MSc students may pursue the PhD without completing the Master's degree, by transfer, provided their progress is judged satisfactory by the supervisory committee and they meet all requirements of the PhD program. Students who decide to transfer are not eligible to follow the accelerated meeting schedule; instead, they follow the supervisory committee meeting schedule and the transfer examination timing of the traditional MSc pathway, as described in the Program Milestones section of this handbook. The transfer examination is governed by the Transfer and Qualifying Examination guidelines.

Timeline at a Glance

The following compares the accelerated and traditional MSc pathways. Research expectations are identical across the two; only the timeline differs.

Stage	Accelerated MSc (1 year)	Traditional MSc
Potential start dates	May 1 or September 1	May 1, September 1, or January 1
First committee meeting	Within the first 2 months	Around 4 to 6 months (optional, recommended)
CHEMBIO 700A/B	First-year Fall and Winter terms	First-year Fall and Winter terms
Additional 3-unit course	CHEMBIO 702 or an alternate 3-unit (700-level) course	CHEMBIO 702 or an alternate 3-unit (700-level) course
Second committee meeting	By the 6th month (advised but optional)	Around 12 to 14 months (required)
Third committee meeting	By the 10th month	Around 18 to 20 months (optional, recommended)
Colloquium presentation	April of the first year	April of the second year
Thesis submission to committee	At least one week before the oral defence	At least one week before the oral defence
Thesis oral defence	By the end of the 12th month	By the end of the 24th month
PhD transfer (if applicable)	Follow the traditional pathway schedule and transfer timing	By the 22nd month

Research expectations are the same for the Accelerated MSc and traditional MSc pathways.

Frequently Asked Questions

Question	Answer
Is it open to co-op students?	Yes, at the end of the fifth year (Level V).
Is the two-year MSc, or transfer to the PhD, still possible?	Yes. The traditional two-year MSc remains available, as does transfer to the PhD program.
Is a teaching assistantship included?	Yes: 130 hours per year, or a research assistantship in lieu if bought out.
Is it a research-based MSc?	Yes.
Can I include my CB 4G12 (or BBS 4T15) results in my MSc thesis?	No. There is no double counting of undergraduate thesis work.
Can I still apply for scholarships?	Yes, normally by early December.

Contacts and Further Information

Program website: chembio.mcmaster.ca

Program office: chembio@mcmaster.ca

Questions about eligibility, the application, or course selection for the accelerated pathway should be directed to the program office, the Program Director, or the Associate Director.

Appendix B: Program Roadmaps

These roadmaps show the expected sequence and typical timing of milestones for each pathway in the Chemical Biology Graduate Program. They are intended as planning aids and are maintained by the program office, which provides students with the roadmap for their pathway on entry. The full requirements and procedures for each milestone are set out in the Academic Requirements and Program Milestones sections of this handbook.

How to read these roadmaps

Timing is measured from the date of registration in the relevant program, unless noted otherwise. The months shown are typical, not rigid deadlines, except where this handbook or the School of Graduate Studies sets a firm limit (for example, the comprehensive examination has an upper limit of 24 months). Start dates and individual circumstances will shift the exact months. Students should review the roadmap for their pathway with their supervisor early in their program and revisit it at each committee meeting.

Roadmap 1: Traditional MSc (Thesis)

The traditional MSc typically takes 20 to 24 months, with a maximum of three years from initial registration. Timing below is measured from MSc registration.

Milestone	Typical timing
Program start	May 1, September 1, or January 1
First supervisory committee meeting	4 to 6 months (optional, recommended)
CHEMBIO 700A/B	First-year
Additional 700-level course (CHEMBIO 702 or an approved alternate)	First year
Second supervisory committee meeting	12 to 14 months (required)
Research presentation at the Chemical Biology Research Day	Second year, typically April
Third supervisory committee meeting (permission to write)	18 to 20 months (optional, recommended)
Thesis sent to the examining committee	At least one week before the defence
MSc thesis defence	By about 24 months (maximum 3 years from registration)

The one-year Accelerated MSc pathway follows a compressed version of this roadmap. See Appendix A for its full timeline.

Roadmap 2: PhD via Transfer from the MSc

This route has two phases. The MSc phase leads up to the transfer examination, with timing measured from MSc registration. After a successful transfer, the PhD phase begins and timing is measured from entry into the PhD.

Milestone	Typical timing
MSc phase (timing from MSc registration)	
MSc program start	May 1, September 1, or January 1
First supervisory committee meeting	4 to 6 months (optional, recommended)
CHEMBIO 700A/B and one additional 700-level course	First year
Second supervisory committee meeting	12 to 14 months (required)
Research presentation at the Chemical Biology Research Day	Second year of the MSc
Transfer examination	12 to 22 months (not beyond Term 6); normally shortly after 18 months. Transfer takes effect September 1, January 1, or May 1.
PhD phase (timing from entry into the PhD)	
Comprehensive examination	18 to 20 months after entry, with an upper limit of 24 months
Annual supervisory committee meetings	At least once per year; report submitted before October 30
Departmental seminar	Before the thesis defence, scheduled by the program
PhD thesis defence	After all requirements are met

Roadmap 3: Direct Entry to the PhD

This route applies to students who enter the PhD directly, holding an MSc from another institution. Timing is measured from PhD registration.

Milestone	Typical timing
Program start	September 1, January 1, or May 1
First supervisory committee meeting	Within 6 months
CHEMBIO 700A/B and one additional 700-level course	First year
Qualifying examination	About 9 months, and no later than 12 months
Research presentation at the Chemical Biology Research Day	During the program (first or second year)
Comprehensive examination	18 to 20 months after entry, with an upper limit of 24 months
Annual supervisory committee meetings	At least once per year; report submitted before October 30
Departmental seminar	Before the thesis defence, scheduled by the program

Milestone	Typical timing
PhD thesis defence	After all requirements are met

Roadmap 4: MD/PhD Program

The MD/PhD program integrates medical training in the Faculty of Health Sciences with doctoral research in the Chemical Biology Graduate Program. During the doctoral research phase, students complete the program's PhD milestones, namely supervisory committee meetings, the transfer or qualifying examination as applicable to their entry route, the comprehensive examination, the Chemical Biology Research Day presentation, a departmental seminar before the defence, and the thesis defence, following the relevant roadmap above for those milestones.

The integrated MD/PhD timeline, including the sequencing of the medical and research components, is maintained by the Faculty of Health Sciences and differs from the standard PhD timeline. MD/PhD students should plan their CBGP milestones in consultation with both the MD/PhD program and their CBGP supervisor, so that the research milestones fit within the integrated schedule.

MD/PhD program timeline: Faculty of Health Sciences MD/PhD program

> Across all pathways, doctoral students meet with their supervisory committee at least once each year and submit the annual report before October 30, and the comprehensive examination carries a firm upper limit of 24 months after entry into the PhD. Where a roadmap and the detailed milestone sections of this handbook appear to differ, the milestone sections govern.

Appendix C: Chemical Biology Graduate Program Travel Award

The Chemical Biology Graduate Program offers competitive travel awards of up to $1,000 to help students attend scientific meetings at which they present their own original research. This appendix sets out who is eligible, the deadlines, the checklist for a complete application, and the application form itself.

About the Award

- **Value:** up to $1,000 per award.
- **Eligibility:** enrolment on a full-time basis in either the MSc or PhD program. Applicants must present their own original data, as either a poster or a talk, at the meeting they plan to attend.
- **Repeat applicants:** students who have received a travel award previously are eligible again only if funding permits.
- **Other sources:** students are strongly encouraged to also seek travel funding from other sources, in particular the Graduate Students Association.
- **Review:** applications are reviewed and approved by the Program Director and the Award Selection Committee. In cases of conflict of interest, a designate assists on an ad hoc basis.

Deadlines

Apply by the deadline that falls in advance of your meeting. Most awards are granted in the spring and summer to accommodate the large number of meetings between May and September; a smaller number are reserved for winter meetings.

Application deadline	For meetings scheduled
March 15	April 1 to June 24
June 15	June 25 to August 31
September 15	September 1 to March 30

Submit the completed application and the required letter to the program office at chembio@mcmaster.ca by the relevant deadline.

Application Checklist

A complete application includes all of the following. Use this checklist before you submit.

Applicant information: name, student number, McMaster email, supervisor, program, and year in program.

Conference details: name, location, and dates.

Title of the presentation.

Confirmation that you are presenting your own original work, as a poster or a talk.

Itemised budget in Canadian dollars: airfare, registration, accommodation, meals, and other costs, with a total.

Account to be reimbursed.

Abstract, including title, authors, and affiliations.

One-page letter explaining the relevance of the meeting and how it will benefit your work (attached).

Signatures of the applicant and the supervisor, with the date.

Submitted to the program office by the relevant deadline.

Application Form

Complete all fields. Attach the one-page letter and, where helpful, supporting documentation.

Name		**Student no.**	
Email		**Supervisor**	
Program		**Year in program**	

Conference name	
Conference location	
Conference dates	
Title of presentation	

Budget

Enter amounts in Canadian dollars (CAD).

Expense	Amount (CAD)
Airfare	
Registration	
Accommodation	
Meals	
Other	
Total	

Account to be reimbursed (if applicable)	

Abstract

Include the title, authors, and affiliations.

Signatures

Applicant signature	Supervisor signature	Date

Attach a one-page letter (maximum) explaining the relevance of this meeting and how it will benefit your work. Submit the completed form and letter to chembio@mcmaster.ca by the relevant deadline (March 15, June 15, or September 15).

Appendix D: Key Forms and Reference Links

Resource	Where to find it
SGS Graduate Calendar (2026 to 2027)	academiccalendars.romcmaster.ca
Master's Supervisory Committee Meeting Report	School of Graduate Studies website; return to chembio@mcmaster.ca
Online PhD Supervisory Committee Report	Initiated by SGS through an emailed link once the meeting is scheduled
Thesis forms (Final Submission Sheet, licences, copyright)	School of Graduate Studies website; questions to gthesis@mcmaster.ca
E-Thesis Submission	MacSphere E-Thesis Submission module
Graduate Studies forms and policies	gs.mcmaster.ca

This handbook does not replace the SGS Graduate Calendar. In the event of any discrepancy, the Graduate Calendar prevails.