



Harvard University

**Chemical Biology
PhD Program**

Student Handbook

Program Contacts

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Program Advising

Incoming students will meet with steering committee members who will help plan the student's initial program of graduate study. Advisors will meet with first-year students individually at the beginning of each semester.

Laboratory Rotations

Students in the Chemical Biology Program are expected to take 2-4 laboratory rotations before selecting a Dissertation Advisor. The program does not set time limits on rotations, but most rotations are expected to be 6-12 weeks long. Students should inform the program coordinator when they begin and complete their rotations.

Rotations allow students to explore different research areas, identify potential collaborators, and experience the environment in different research groups. The purpose of the rotation is to facilitate the choice of the dissertation laboratory, not to accomplish a research project. Students may rotate in the labs of the Chemical Biology Program faculty (Harvard faculty who have expressed an interest in having Chemical Biology Program Students in their labs) or with [HILS faculty](#).

First year students must choose their dissertation laboratory no later than June 30th.

Course Requirements

Students are required to take *CB300: Introduction to Chemical Biology Research*, *CHEM110: Small Molecules and Biological Processes*, *MedSci300QC: Responsible Conduct of Science*, *CB2200: Methods and Tools in Chemical Biology*. In the spring semester, students must choose between *BCMP236: Principles of Drug Action in People* and *BCMP 250: Biophysical and Biochemical Mechanisms of Protein Function*. The final 12 credits of courses are electives; these are typically 4-credit courses but can include 2-credit courses as long as the total is 12 credits. Of these, one elective may be taken SAT/UNSAT.

Registration

Students can register for courses online at <https://my.harvard.edu>. Once students complete check-in, they are ready to begin adding courses to their *Crimson Cart*. For students to be considered a full-time student, they must sign up for **16 credits** each semester.

- Students who are not taking 4 letter-graded courses and have not joined a lab should sign up for the rotation course, CB399, the appropriate number of units to bring them to 16 credits total
- Students who have permanently joined a lab should use CB350, (under their PI's name) the appropriate number of times to bring them to 16 credits total

Check your Academic Advising Report in my.harvard for a quick overview of what you've completed and what's left.

Required Courses

ALL YEAR

Chemical Biology 300hf. Introduction to Chemical Biology Research

Phil Cole and Emily Balskus

Fall and Spring Term: Wednesdays 4:30-5:30, Location: Longwood & Cambridge Campus

Lectures introduce the research areas of current program faculty in chemical biology. Students must complete both parts of this course (parts A and B) within the same academic year to receive credit.

*Note: Students will be emailed the finalized schedule prior to the official start of classes.

FALL

Chemistry 110. Small Molecules and Biological Processes

Matt Shair

Fall Term: M, W 10:30

This course will cover the chemical and biological principles that govern small molecule therapeutics. We will discuss small molecule conformational analysis, chemical forces that drive small molecule-protein interactions, and small molecule binding to proteins to affect disease states. We will also discuss how protein targets are identified and the frontiers of modern small molecule therapeutics. Protein targets include, but are not limited to kinases, proteases, GTPases, scaffolding proteins, epigenetic modifiers, metabolic enzymes and transcription factors. This course will teach students how to use modern computer modeling applications to perform structure-based design of small molecule ligands.

J TERM

Chemical Biology 2200. Methods and Tools in Chemical Biology (Boot Camp)

Randy King (Medical School) and Melissa Leger-Abraham (Medical School)

M.- F., 9am–5pm - two weeks in January

This course will provide a survey of major topics, technologies, and themes in Chemical Biology, with hands-on exposure to a variety of experimental approaches, followed by an introduction to proposal writing.

Notes: Intended for first-year graduate students in the Chemical Biology program; permission of the instructor required for all others. This course will include an introduction to the use of MATLAB for model-building.

SPRINGBCMP 236. Principles for Drug Action in People

Sara Buhrlage (HMS)

T & Th, 3:30pm-5:00pm

This course will discuss principles of early drug discovery, drug modalities, and drug pharmacology. In the first part of the course, fundamental aspects of receptor and enzyme targeting agents, drug mechanism, drug metabolism, pharmacokinetics and pharmacodynamics will be described. Selected examples of small molecule drugs, biologics, gene and cell therapies will be utilized through the course. In the second part of the course, the pharmacology of therapeutics that act on selected human physiological systems, specifically the cardiovascular, immunologic, and central nervous systems, will be covered. The course will include frontier lectures delivered by experts at Harvard and in the Biopharmaceutics industry. A range of

speakers enlisted from the Harvard faculty and pharmaceutical scientists will participate in teaching throughout this course.

Notes: Please note that all sessions will be held in person. All course materials including lecturers PowerPoint presentations will be posted on the course website. Attendance to all in class activities, discussions and journal clubs is mandatory; not attending these without an excused absence can lead to an incomplete grade for the course.

BCMP 250. Biophysical and Biochemical Mechanisms of Protein Function

Josephina del Marmol (HMS)

T & Th, 11:00am-12:00pm

This focuses on the molecular mechanisms that underlie essential biochemical processes such as signal transduction. Major topics include biochemical thermodynamics and conformational equilibria, protein structure and folding, receptor pharmacology, allostery, and enzymatic mechanisms of signaling. The course includes both content lectures and research frontiers seminars focused on current research in biochemistry with an emphasis on signal transduction in therapeutically relevant pathways.

Notes: A foundational biochemistry course is recommended as a prerequisite (we expect students to have a solid understanding of the core concepts in biochemistry and molecular biology, including knowledge of the amino acids and their properties as well as the central dogma).

FALL (G2 year)

Medical Sciences 300qc. Responsible Conduct of Science (2 credits)

Aimee Hollander & Rosalind Segal (HMS)

This course is a required course for all OGE PhD students and all who receive support from NIH training grants. The goal of this course is to inform students about the appropriate conduct of research and the many ethical and social challenges that they may encounter during their research career in graduate school. The structure consists of highly interactive, in-person, small groups discussion sessions moderated by a faculty member, and live Zoom lectures. Challenges discussed include (but are not limited to) experimental design and practices, equity in research, conflict of interest, research misconduct, interactions with members of the laboratory and the mentor, and the ethical role of the scientist in society.

Notes: This course requires students to enroll into faculty member sections for the 6 in-person group discussion sessions **during the registration period**.

Fellowships

The Chemical Biology Program expects all students who are eligible to apply for fellowships.

Teaching

Students are required to complete one semester of teaching that is at minimum 0.20 FTE, preferably by the end of their second year. It is recommended that they do not teach and have their PQE during the same term. Students should inform the program administrator as they make plans to fulfill their teaching requirement.

Beginning in Academic Year 2027–28, compensation received through a Teaching Fellow (TF) appointment used to fulfill the program's teaching requirement will count toward the student's standard program support. The student's stipend will be reduced by the amount of TF compensation received so that the combination of stipend and TF compensation equals the student's standard level of support.

TF positions are arranged by each individual department, so there are no universal deadlines or contacts. It is usually best to contact the faculty member or preceptor of the course that you are interested in teaching.

Preliminary Qualifying Exam Guidelines (PQE)

Purpose of PQE meetings:

PQEs are an opportunity for our second-year students to put together ideas and potential plans related to their thesis research, prepare a succinct document on these ideas and plans to a faculty committee, and then meet with their committee to present their PQE proposal and answer questions about it. It is the expectation of the Chem Bio Program and Harvard that the students demonstrate depth and breadth regarding the subject matter of their proposal. Recognizing there is some subjectivity in what constitutes depth and breadth, it is fair and reasonable for students to be asked questions about methods and concepts adjacent to the specific topics of the proposal. Based on their overall performance, the committee will assess whether to grant an unconditional pass, a conditional pass, or a fail. They will also receive feedback on the strengths and weaknesses of their PQE proposal and responses to questions. The overall goal of the PQE experience is meant to assess that the student is on track to progress to the dissertation phase of their PhD.

Timing and scheduling of PQE meetings:

The PQE should be completed by June 15 of the second year unless approval is granted for an extension. The Chair of your PQE will be assigned by the Program Co-directors and in general will be an experienced Harvard Chemical Biology faculty member. Students should start the scheduling process at least three months prior to the desired meeting date. PQEs should be scheduled to allow for 2 hours and preferably should occur in person, but zoom is acceptable if

needed by members of your committee. Once the PQE has been scheduled, the student must enter their committee and PQE details in my.harvard which will prompt the chair to complete the evaluation after the exam.

Composition of PQE committees:

The PQE should include three Harvard faculty members, including the chair, selected in part for their experience related to the proposal topic. The student should consult with the chair of the committee to select faculty members for the PQE. The committee should not include the thesis advisor(s).

Expectations for PQE proposals:

The PQE proposal should normally be about 6-9 pages (including figures but not references) and should include specific aims, background, preliminary data, and future plans. It is recommended that the student share/discuss the specific aims with the chair either in person or by email at least 4 weeks before the PQE to get feedback/advice. The PQE proposal should be written independently, without consultation with the thesis advisor although it is ok to receive advice from other trainees in the lab or the program. The PQE proposals should be shared with the committee and program administrator at least 7 days before the PQE meeting.

Expectations for PQE meetings:

At least 24 hours prior to the PQE, the PhD advisor should send the committee a brief paragraph (100-200 words) summarizing the student's progress, including their strengths and areas for improvement, as well as any concerns the advisor would like the committee to consider.

At the beginning of the PQE meeting, the student should step out for 5 minutes to allow the committee to discuss the advisor's feedback, review the proposal, and coordinate how they would like to approach questioning. The student will give a 30–40 minute presentation of their proposal, including the specific aims, background, preliminary data, and future plans. It is recommended that the student be given about 10 minutes of uninterrupted time at the outset to become comfortable and establish the context for the proposal. Committee members may begin asking questions, with the remainder of the presentation proceeding in an interactive format.

Ideally, the examination portion of the PQE should conclude within 1 hour and 45 minutes. The student should then step out again to allow 15 minutes for committee deliberation. Prior to the PQE, students will enter their committee and PQE details in my.harvard which will prompt the chair to complete the PQE evaluation form. The form records the committee's decision - Pass, Conditional Pass, or Fail and provides an opportunity to give feedback on the written proposal, oral presentation, and the student's performance during the question-and-answer portion of the examination.

Results:

- Pass: The student becomes a candidate for a PhD.
- Conditional Pass: The committee re-examines the student before the end of the fall term of the G3 year. The committee decides the re-examination format, which may involve a written report to address specific concerns of the committee or re-assembled committee.
- Fail: The student is withdrawn from the program.

Dissertation Advisor and the Dissertation Advisory Committee Policy

Choosing a Dissertation Advisor

When the Dissertation Advisor has been selected (by **June 30th** of the G1 year, students must fill out their choice in my.harvard.

Dissertation Advisory Committee (DAC)

After passing the PQE, a DAC of at least three members (in addition to the Dissertation Advisor) must be appointed and a meeting schedule 3 months after the PQE. Students should hold their first DAC meeting, 6 months after the PQE.

Purpose of DAC meetings:

DACs provide an opportunity for the student and advisor to get constructive feedback about the student's research project from the DAC members, providing strategic and tactical advice, helping address challenges, sharing ideas about publication and professional development, and finalizing the work for a thesis. In addition, DACs help the Chem Bio program ensure that students are receiving the support they need, maintaining healthy mentor-mentee relationships, and remain on track to complete their degrees in a timely manner.

Timing and scheduling of DAC meetings:

It is important that DACs start early in the third year (no more than 6 months after the PQE) and have follow-up meetings every 12 months thereafter (or more frequently if the student and committee favor it) until the box is checked for thesis writing. We recognize that scheduling DAC meetings can be challenging. Therefore, students should begin the scheduling process at least three months before the anticipated meeting date. The program administrator will make an effort to send you reminders, but you and your advisor are responsible for ensuring that these meetings happen on time. DAC meetings should be scheduled for 2 hours but may be shorter at the discretion of the committee.

Composition of DAC committees:

The DAC should normally include four Harvard faculty members, including the thesis advisor, selected for their expertise in the thesis topic. You can also include a faculty member outside of

Harvard, typically someone from another local institution (e.g. MIT). The chair of the committee should be a member of the Chem Bio faculty roster, other than the thesis advisor.

Expectations for DAC reports:

The first DAC report should normally be about 6-9 pages and should include specific aims, background, preliminary data, and current and future plans. There should also be a brief section on non-project updates such as publications, conferences attended/presented at, internships, and other activities. Follow-up DAC reports should normally be 3-6 pages and include a summary of the work done over the past year, challenges encountered, and non-project updates. The DAC report is normally written in consultation with the thesis advisor. These reports should be shared with the committee at least 7 days before the DAC meeting. Recognizing that the structure may change, you are encouraged to include a tentative thesis outline at your G4 DAC to help the committee provide the most useful feedback as you work toward completing your dissertation.

Expectations for DAC meetings:

At the beginning of the DAC meeting, the student should step out for 5-10 minutes to allow the committee to speak privately with the advisor about the student's progress and discuss any concerns that may need to be addressed. This should be followed by the advisor stepping out to allow the committee to speak with the student about how they are doing and to provide an opportunity for the student to discuss their experience in the lab and with their mentor. The student then presents a summary of their research to the DAC committee and advisor in a highly interactive discussion. There is a section at the end of the meeting that briefly addresses professional development topics and other relevant activities. Before each meeting, the student creates an online DAC form, which is completed by the committee chair following the meeting. The form summarizes the work presented and documents the committee's recommendations for the student.

We recognize that there is a natural tendency to view a DAC meeting as an opportunity to showcase the student's progress and accomplishments. However, the DAC committee is often most valuable when it can help the student troubleshoot challenges, provide guidance, and identify priorities for follow-up. For this reason, it is important that DAC meetings not be delayed beyond the recommended 12-month period.

IDPs

Once Chemical Biology students choose an advisor, they are required to complete an Individual Development Plan (IDP) meeting with their Dissertation Advisor (or an alternate Harvard faculty mentor of their choosing) annually. An IDP provides students with the opportunity to think about their training objectives, their progress towards them, and work with their mentor to set or refine goals for the future. The National Institutes of Health (NIH) encourages trainees to make Individualized Development Plans to help them prepare for academic and non-academic careers. IDPs are essential to the training grant and program's continued success.

Students and their mentors should read the Molecular Cell article “[Yearly Planning Meetings: Individualized Development Plans Aren’t Just More Paperwork](#)” that describes an approach to implementing IDPs and the benefits of IDPs. We encourage students to visit the Harvard Office of Career Services and <http://myidp.sciencecareers.org> where they provide additional resources on IDPS, mentorship, and careers in science.

Sharing the IDP form is not a requirement, nor will the IDP form be kept on file by the program. Students are free to share as much or as little of the plan as they feel comfortable. Note that the IDP process is most effective when it serves as a framework for open and candid discussions with the advisor. Students must notify the Program Administrator of the IDP meeting date and the name of the faculty member that they met with. For G1 students, this planning discussion will take place during the January meeting with their faculty advisors, which serves as the fall semester advising meeting.

Dissertation Preparation and Defense

The Dissertation Advisory Committee, in consultation with the Dissertation Advisor, determines when it is time for a student to stop laboratory work and begin to write a dissertation. Once a student has been given permission to write a dissertation, the Program Administrator should be contacted to schedule an appointment to discuss requirements, deadlines, etc.

Deadlines

- Once given approval to defend, the student must defend within 6 months.
- 6 weeks prior to defense student must submit the defense information form via my.harvard
- Online Degree Application must be completed by the deadline (consult GSAS Degree Calendar)
- The dissertation must be submitted to the Committee and program administrator 2 weeks prior to the defense.

Dissertation Format

The dissertation must show original treatment of a fitting subject, contain a scholarly review of the pertinent literature, give evidence of independent research, and be clearly, logically, and carefully written. Students are expected to give a public seminar on their dissertation research.

The Ph.D. dissertation is expected to contain a substantial amount of independent research work of publishable quality. In addition to chapters of research, each dissertation must contain Introduction and Conclusion chapters that present the themes of the dissertation and summarize the accomplishments. In some cases, the student has done all of the work in the dissertation; more often portions of the dissertation result from collaborative research. In all dissertations

containing collaborative results, the dissertation should indicate concisely who contributed to the work.

Dissertations should be submitted in their final format, in accordance with the Kenneth C. Griffin Handbook for Students. The Registrar's Office will review the document for formatting compliance. Formatting errors may prevent the conferral of the degree, and the student may need to apply for the next available degree period. Student can review alumni dissertation in [DASH](#)

Writing Resources

- [Office for Scholarly Communication \(OSC\)](#): If your dissertation includes previously published works, it is recommended that authors consult their publishing agreements directly to determine whether and to what extent they may have transferred exclusive rights under copyright.
- The Open Scholarship and Research Data Services Office is available to help you determine whether you have retained the necessary rights or requires permission. HL.OSRDS@harvard.edu.
- [Harvard Griffin GSAS Fellowships and Writing Center](#): Offers individual writing consultations and workshops. They also run the *Writing Oasis* which provides a space for accountability, productivity, and peer support.
- [Academic Resource Center](#): ARC offers individual coaching, Dissertation Writers Accountability Groups, and many other helpful workshops.
- [iThenticate](#): A web-based application that enables authors to compare their manuscripts, grant proposals, and other writing against web and scholarly publications to check for similar or duplicate content. This tool is for individual use only and for the similarity checking of an author's own work.

Defense

Public Seminar

The public seminar is limited to 1-hour, including the advisor's introduction, the student's oral presentation and acknowledgements, and audience questions and answers. The Defense Committee is required to attend the public seminar; however, it is customary for members of the defense committee to hold their questions until the private oral exam.

Private Examination

A public seminar is followed by a 1-hour private examination. Dissertation advisors may be present, but they must not participate in the exam (e.g., answer questions posed by the

committee). Initially, the student will be asked to leave the room for a few minutes. During this time, the committee will discuss the merits of the dissertation, any issues with the dissertation, and areas they may want to focus on during the exam. The student is then asked back into the room for the exam. Each member of the defense committee will direct detailed technical questions as well as broader questions on the conclusions, impact, and limitations of the research to the candidate based on their review of the dissertation and presentation of the seminar. The Defense Chair will moderate the discussion between the panel and the student.

At the end of the examination, the student is once again asked to step out of the room for several minutes. The Committee will discuss any corrections needed for the dissertation and whether these corrections need to be reviewed and by whom. Once the committee determines the outcomes, the student will be asked back into the room, and the Committee provides the student with any changes needed to the dissertation.

Dissertation Examination Committee

GSAS states that the Dissertation Examination Committee must be comprised of three faculty members, including the dissertation advisor. Two of the faculty must be FAS faculty or be a member of the program faculty. The third member can be from outside of Harvard. The chair of the committee must be a member of the program faculty. The Chairperson of the DAC should preferably chair the examination, but students may invite another DAC member to do so. The role of the chairperson is to (a) be impartial, (b) arbitrate problems, and (c) administer the exam.

It is perfectly acceptable to use the DAC committee for the defense committee. It is not a requirement that students choose new committee members.

Master of Arts (AM)

The chemical biology graduate program does not grant a terminal AM degree. However, upon completion of certain requirements, students in the chemical biology PhD program may apply for the AM degree. A thesis is not required.

Residence:

A minimum of one-year full-time study is required.

Course Requirements & Research:

The student must pass eight advanced four-credit courses diversified among the fields of chemical biology with average grades of B or higher.

- Grades of B- will count as a pass if balanced by a B+ or better on a one-for-one basis.
- Grades of C+ or below will not count.

- Normally, four of these four-credit courses are classroom work, and the remaining four are reading and research courses.

Students must also meet the GSAS GPA requirement of 3.0. In cases where a student receives one UNSAT in a reading and research course, if they have previously received a SAT in a research course and have met all other requirements, they may be eligible for an AM degree upon withdrawal from the program.

Approval of the application for the AM degree is contingent upon the satisfactory completion of the required eight four-credit courses.

Student Funding

The final stipend or salary you receive will depend on when you defend your thesis. If you defend on or before the 15th of the month, your pay will end the month of your defense. If you defend after the 15th of the month, your final month of pay will be the following month.

Examples

- If you schedule your defense on the 15th of October, your final day of pay as a graduate student will be October 31st.
- If you schedule your defense on the 21st of October, your final month of pay as a graduate student will be November 30th.

Registration & Health Insurance

Please review the HUSHP graduating student's website: <https://hushp.harvard.edu/graduating-students>

November Degree:

Health Insurance – Coverage ends on July 31, *Registration* – Previous spring semester.

November Degree with fall term health insurance:

If you would like to continue health insurance through the fall semester, you need to do the following:

- Have your advisor agree to pay for health insurance through the fall semester and contact Colleen Frain at cfrain@fas.harvard.edu
- Submit your dissertation online to the registrar through the registrar's website **ON September 3, 2026, ONLY**

February Degree:

Health Insurance – Coverage ends on January 31. *Registration* – Register for the previous fall semester

May Degree:

Health Insurance – Coverage ends on July 31. *Registration* – Register for the spring semester

Thesis Acceptance Certificate

Following the examination, the candidate must, with the help of the dissertation advisor, make any necessary corrections to the dissertation. If corrections require review, those revisions should be approved by the examination committee chair or by a faculty member designated by the committee chair, who will then notify the Program that all revisions are complete.

If no corrections are required or once the corrections are complete, the Program Administrator will email the student an electronic copy of your Thesis Acceptance Certificate (TAC). Please attach this TAC to your dissertation right before your title page with a blank page immediately following the TAC. No page number should be assigned to this page.

Submission

Before submitting your dissertation, review your final copy and make sure it abides all of the formatting requirements (pgs. 19 - 22) set by Harvard Griffin GSAS. Students can embargo (pg. 22) their dissertation for six months, one year, two years, or more. Embargo periods over two years require a signed approval of delayed release form.

The dissertation must be submitted electronically through **ProQuest ETD** to the FAS Registrar's Office for approval to receive the degree. Dissertations must be received by 11:59 PM on the deadline date for the given degree period. No extensions to this deadline are provided.

Events and Seminars

Annual Retreat

All current Chemical Biology students and faculty are invited to attend the Chemical Biology Program Retreat. The purpose of the retreat is to bring the entire community together to learn about current research in Chemical Biology. Faculty and fifth-year students present their research orally, and second-, third- and fourth-year students present posters.

Data Club Talks – Student Talks

Third year students will present their data in an informal setting to fellow students and faculty in the program. It is expected that all students in the program will attend these talks as they will serve as an invaluable part of their education and a wonderful opportunity to develop a dialogue to discuss the big questions of Chemical Biology. The talks will be 10 minutes in length followed by 5 minutes of questions and answers from the audience. These will be scheduled by the Chem Bio administrative team, and there will ordinarily be two data club meetings each term.

CCB Seminars

The department of Chemistry and Chemical Biology offers several seminar series that feature a wide range of topics from organic and inorganic to human disease, etc. Many of the series feature speakers that represent both CCB and CBP faculty as well as those from outside Harvard and MIT. For listings, please visit <https://www.chemistry.harvard.edu/calendar/>

Other Seminar Series

Many of the individual departments throughout the Cambridge and Longwood Campuses, and the Broad Institute, offer seminar series that may interest students of the Chemical Biology Program. We encourage all of our students to explore the variety of seminar options and attend whenever feasible. CBP students should contact program or Department Coordinators to be added to seminar mailing lists that interest them.