



PhD Program in
Biomedical Informatics

BMI DISSERTATION ADVISORY COMMITTEE GUIDELINES

Mission

The Dissertation Advisory Committee (DAC):

- Is a scientific advisory committee that will provide expert advice on all aspects of the thesis, from experimental paradigms to project feasibility within the time frame of a PhD thesis.
- Will help monitor student progress to ensure that the major objectives and standards (discussed below) for completion of a PhD thesis are being met in a timely fashion. In this capacity, the DAC determines whether the student's research meets the requirements of the program and when the student may begin writing the thesis. In addition to evaluating completed experiments and manuscripts, progress will also be considered with respect to maturity in scientific judgment.
- Will help resolve any conflict between student and advisor or other lab members.
- Serves as a liaison to the BIG program directors and administration.

How to form a DAC

- The committee is made up of a Chair and 2 other faculty members.
 - The Chair must be a member of BIG faculty.
 - The second committee member must be Harvard Faculty
 - The final member may be selected from either BIG faculty, other Harvard departments, or from another Boston-area university. It is strongly encouraged that they are from the bioinformatics and genomics field.
- The student's Dissertation Advisor cannot serve as a formal committee member or committee chair.
- The Dissertation Advisor is expected to attend all meetings.
- A collaborating faculty member may not be a committee member.
- Although not required, faculty collaborators are encouraged to attend.
- We suggest that students choose committee member who are generally accessible and who s/he would feel comfortable consulting informally.
- Students should consult with their Dissertation Advisor about possible DAC members after choosing a dissertation lab.
- For future planning, keep in mind that at least one of your DAC members who are also DMS faculty will need to be on your thesis defense committee.

The DAC Chair

- The DAC has a key role in charting and facilitating the progress of students in the program. The DAC chair is responsible for making sure that the views of the DAC are effectively communicated to the student and that any major concerns of the DAC are

effectively communicated to the advisor and/or to the BIG program. DAC chairs are also expected to guide DAC members in BIG and DMS policies and standards of practice for advising.

How to set up a DAC meeting

- Students are responsible for scheduling their DAC meetings.
- Scheduling a meeting with several busy faculty members can be extremely challenging. **We recommend that the student initiate the scheduling process two to three months prior to the desired date.** Including their assistants in the emails may help expedite the scheduling.
- Helpful web-based scheduling services include:
 - Doodle: <http://www.doodle.com>
 - When is good: <http://whenisgood.net/>
- To schedule a room at HMS and Countway, contact Catherine Haskell (617-432-7856, Catherine_Haskell@hms.harvard.edu)
- It is a good idea to check before the meeting that the presentation will be displayed correctly on the screen or projector.

Timing and frequency of DAC meetings

Initial meeting:

- The initial DAC meeting must be held within 4 months of the PQE
- Preliminary data may include work completed by the student and/or others in the lab.
- All work completed by the student should be included, even if scientific goals have changed and the student's work is no longer the basis for future experiments – in this way, all accomplishments can be acknowledged.
- Students should start the process of scheduling this meeting within 2 months of the PQE given the complexities and time often required to establish a date workable for all.
- For BIG student, this meeting will likely be held during the summer after G2 or early in the fall of G3.

Subsequent meetings (through G5):

- Subsequent DAC meetings must be held every 9 months, and in some cases more frequently (e.g. every 3 months), depending on DAC recommendations.

G6 (if necessary)

- DAC meetings must be held every 6 months or even more frequently (e.g. every 1-3 months), pending DAC recommendations.

Format of student's Research Progress Report for DAC meetings and outline of thesis.

General: The student's Research Progress Report must be submitted to the BIG Program office and each member of the DAC 7 days in advance of the DAC meeting. It is expected that the student will receive feedback from his/her advisor on the report before it is submitted;

thus, it is recommended that the student provide a draft of the report to their advisor several days before the report needs to be submitted to the committee and program office.

Prior to each DAC meeting, upon receiving the written documents from the student, the DAC chair has the responsibility of reviewing the documents to assess whether they are acceptable for going forward with the meeting. If there is an issue, the DAC chair should contact the student and PI directly.

For ease of review, the document text should have 11 pt font with 1.5 line spacing; margins at 0.5" and pages numbered. The Research Progress Report cover sheet should include the title of the project; the student's name, year, e-mail address; the advisor's name; an indication if this is the initial DAC meeting; the names of the members of the DAC committee; and the date, time, and location of the DAC meeting.

Initial DAC meeting Report: The student write-up for the initial DAC meeting takes the form of a grant proposal in which a biological question or technology is proposed for in-depth investigation.

The initial DAC meeting write-up is expected to be a substantial document (no longer than 15 pages excluding figures) and should be structured as follows:

- Specific Aims: The Aims of the student's dissertation research (~1-2 page).
- Background and Significance: Concise review of scientific literature relevant to the proposal, with emphasis on critical knowledge gaps likely to be filled, at least in part, by the proposed thesis research (~3 pages).
- Preliminary Results: Data that are directly relevant to the proposal, including data generated by the student (although in many cases the student will not as yet generated substantial data) and by other members of the laboratory. It is anticipated that this may be an exploratory period. (~2-5 pages).
- Research Methods: Describe proposed research methods by Aim, include how the data will be interpreted and possible pitfalls and alternative approaches (typically 3-5 pages).

Subsequent DAC meeting Reports should take the form of the 2-to-3-page NIH Progress Report: For each subsequent DAC meeting, the Research Progress Report should not exceed 3 pages (excluding figures) and should consist of:

- Specific Aims: If the aims have been modified from the original DAC meeting write up, the revised aims should be presented and the reasons for the modifications.
- Studies and Results: The studies directed toward specific aims and the positive and negative results obtained should be presented, as well as any technical problems encountered and how addressed.
- Significance: A brief discussion on the significance of the findings to the scientific field.
- Plans: A summary of plans to address the remaining Specific Aims, including any important modifications to the original plans.

If major changes in thesis aims come to pass it would be appropriate to submit a longer document. In all cases, the initial DAC write-up should be appended to the Progress Report upon distribution to DAC members prior to the DAC meeting.

Thesis Outline: In addition to the Research Progress Report, the student should prepare a brief (1 page) draft outline conceptualizing how current directions might be compiled into thesis chapters. This outline might take the form of possible titles for chapters of his/her

thesis and the hypotheses, questions, or technical developments likely to be addressed. For example, a dissertation often contains chapters structured as follows:

- Chapter 1 - Introduction: Brief review of the scientific literature relevant to the proposal with a clear description of the overall hypothesis being tested in the thesis.
- Chapter 2 – Presentation of a specific question or hypothesis being tested and its relationship to the overall hypothesis of the thesis.
- Chapter 3 etc. – (As for Chapter 2) As appropriate, additional data chapters should be included. Chapter 4 (or higher) – Discussion: ultimately to be a summary of accomplishments and significance of findings.
- Appendix – Methods and findings somewhat peripheral to the main thesis but which nonetheless deserve representation within the dissertation as a whole and which can benefit the student and the lab by having this material organized in one easily accessible document.

What happens at a DAC meeting?

Student and faculty alternately leave the room

- To provide an opportunity for both the student and the adviser to communicate with the DAC members on a confidential basis, the meeting will start with first the student leaving the room and then the advisor leaving the room.
- In the absence of the student, the advisor will have a chance to present his/her assessment of the student's progress and whether the student is on course to graduate in a timely fashion.
- In the absence of the advisor, the student may likewise communicate his/her own assessment of his/her progress and whether the advisor and the laboratory environment provide the support that he/she needs.
- This is also an opportunity to share with the committee any other problems of a confidential nature that the student needs help with.

Student presentation

- The main part of the meeting will consist of a 20-40 minute presentation by the student of results and plans. Committee members will typically interrupt the presentation with questions, but the Chair will make sure that the student has the opportunity to demonstrate mastery of his or her field and scientific maturity.

Assessment of student's progress

- The student's progress will be assessed by the DAC in several areas:
 - Progress on a line (or multiple lines) of experimentation having potential to lead to one or more first-author publications;
 - Development of an ability to think independently, including development of hypotheses, practical approaches for testing hypotheses, critical interpretation of data, understanding relevance of results in light of current thinking in the field, and judging how to effectively pursue the line of investigation;
 - The DAC Research Progress Report is an opportunity for the committee members to assess the development of the student's ability in science

- writing and give constructive feedback;
- The DAC Research Progress Report and meeting is an opportunity for the committee members to assess the student's knowledge and analysis of the scientific literature relevant to his/her field of investigation.
- Note that it is helpful to the student that scientific maturity and independence are discussed as these are often areas in which students excel yet are not always adequately reflected by the status of manuscripts.

Timeline and Benchmarks

The thesis proposal should be crafted with the goal of completing all of the work required for a PhD thesis within five years from entry into the BIG program. This takes planning and considered evaluation of the main aims of the project. We realize that progress is unpredictable and sometimes the most fruitful approaches are also the most challenging and take longer to bear fruit. Thus exceptions are anticipated.

Year 1:

- Complete rotations, course work.

Year 2:

- Choose thesis lab by Aug. 31 going into second year (2025 cohort onward)
- Complete course work and TA requirement
- Complete the PQE by Jan. 31 (2025 cohort onward)
- Have a clear plan for a thesis project that will be presented at the first DAC meeting – it is understood that plans will evolve over the course of the thesis, especially given that creativity is highly encouraged yet comes with risk and often delays.

Year 3:

- Have clear evidence of progress toward meeting the goals of the thesis proposal.
- A preliminary list of potential thesis chapter titles is encouraged as a means to start thinking about the overall dissertation hypothesis and the different ways the evolving work could be packaged as a dissertation.

Year 4:

- Solidify directions as relates to thesis chapters, which should include a body of work that will form the basis of one or two first author, peer-reviewed, primary research papers. While publication is not a degree requirement, bringing a body of work through to publication is an important skill to learn, thus we encourage that a plan for possible first author publication(s) begin to be discussed at DAC meetings even as early as year 4.
- Please know that we strongly encourage creativity and realize that it is often accompanied by longer timelines.

Year 5:

- Continue filling in the outline of the thesis with data and discussion.
- Continue discussions as relates to plans for publication(s).
- Because bringing a story to closure in the form of a publication is an important skill to learn, we encourage manuscript submission prior to the Ph.D. defense.
- If deemed helpful to the student or DAC process, an UberDAC (pg 5) may be created to provide additional faculty-student interactions.
- Defend Thesis.

Requirement for granting of a Ph.D.

- BIG requires each student to complete a body of primary research of publishable quality. While we do not require a first-author research paper for degree attainment, we hope that the vast majority of graduating students will have at least one published first-author, peer-reviewed, primary research paper at least submitted or largely prepared prior to graduation. In addition to evaluating completed experiments and manuscripts, readiness to graduate will also be considered with respect to maturity and independence in scientific judgment – there are indeed cases where maturity outpaces publications and this should be acknowledged positively and considered in regard to box-checking.

Changes to the faculty composition of a DAC

- Students should choose a DAC chair likely able to serve for the duration of the thesis, regardless of changes in scientific direction of the project.
- If a DAC member is unable to continue to serve on a DAC, or if the scientific direction of the dissertation project changes, DAC members can be replaced, or additional DAC members added to the committee, at the discretion of the student and advisor, and with the prior agreement of the DAC chair and BIG program directors.
- Approval from BIG program directors is required for exchange of a DAC member.

“Checking the box”

- When the Dissertation Committee agrees that the student has met the requirements for earning a Ph.D. and is ready to begin writing his/her thesis, the Committee will "check the box" on the student's DAC meeting form that indicates this.
- The student's dissertation defense must take place within 3-6 months of the date on which the box is checked; to delay the defense beyond this time point requires that the student petition the BIG directors for permission.

Attributions to the Dissertation (DMS policy):

- 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 the work. For example, a chapter containing multi-authored, published work must include a complete reference and a brief description of the candidate's and the colleagues' contributions. For work that is not published but which resulted from multiple researchers, the contributors must be named and respective

attributions made clearly. This policy allows stylistic flexibility; depending on the amount of collaborative work in the dissertation and the status of publication(s), the attributions can be together at the end of either the Acknowledgments or Introduction sections of the dissertation or before each relevant chapter. It is permissible for more than one student to include work from the same collaboration or publication as long as the required attributions are clear, justified, and complete.

UberDAC committee

- Should concerns (e.g. surrounding progress to degree) raised by the student, DAC chair, or PI benefit from an elevated level of attention, a supportive mechanism will be engaged by which one or both BIG program directors join the DAC to form an “UberDAC” in order to facilitate establishment and execution of a plan for helping the student move forward. Such a plan will routinely involve greater delineation of experimental goals, a timeline by which they are expected to be completed, more frequent DAC meetings and meetings with the program directors to help support the process.

HMS Policy on Conflict of Interest

Any potential conflicts of interests should be discussed at the beginning of each DAC meeting. Should concerns arise, please bring them to the attention of the BIG program office and directors.

Mentor's obligations to students and trainees in industrial sponsored research

- (a) Trainees (medical students, graduate students and post-doctoral fellows) must always be encouraged to conduct research in areas that optimize their training. Special care must be taken to assure that a trainee's research is not designed to (and does not appear to) enhance their mentor's Financial Interest, and is not adversely affected by that interest or by contractual aspects of the Sponsored Research agreement that inhibit scientific communication or that commit intellectual property rights to the industrial sponsor.
- (b) Before embarking on a research project, a trainee must be provided by the mentor with a clear description of 1) any corporate support of the research to be undertaken, 2) any personal Financial Interest the mentor has in a sponsoring Business, and 3) any restrictions that might be imposed on the scientific communication of the data.
- (c) Written approval must be obtained before a trainee can be assigned to conduct research which is sponsored by a Business or which involves a Technology to which the Business has license rights, and in which the mentor has any Financial Interest. In the case of graduate students (Ph.D., M.D./Ph.D., M.P.H., and D.M.Sc. candidates), permission must be given by the chairperson (or designated Faculty member or committee) for the graduate program and by the mentor's department chairperson. In the case of medical and dental students (M.D., and D.M.D. degree candidates), permission must be given by the mentor's Medical School department chairperson. Additionally, for research in the Quadrangle departments, permission must be given by the Executive Dean for Academic Programs. For research in the Hospital, permission must be given by the appropriate Faculty Dean.
- (d) A trainee may appeal his/her involvement in any industrially Sponsored Research or research which involves Technology to which a Business has license rights when the trainee believes that he or she is being adversely affected by any conflict of interest (real or apparent) resulting from the mentor's relations with the sponsoring Business or with any Business that may benefit from the trainee's research or from the Sponsored Research agreement. The appeal should be made as appropriate to the Executive Dean for Academic Programs, the Hospital's Faculty Dean, and or the School's or Hospital's Ombudsperson.