

THE CANCER BIOLOGY GRADUATE PROGRAM
UT SOUTHWESTERN MEDICAL CENTER AT DALLAS

Steering Committee

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John Minna, Jerry Shay (Chair): Revised 8/25/2009

A. Description of the Program

The Cancer Biology faculty provides graduate training in interdisciplinary studies relating to the four well organized Cancer Center Programs in Chemistry and Cancer, Cancer and Development, Cancer Cell Networks, and Molecular Pathogenesis and Therapeutic Targeting of Cancer. In addition, there are emerging programs in DNA Repair and Radiation Biology and Cancer Prevention and Control.

B. The Curriculum

1. Core Curriculum:

Students in the Ph.D. program participate in the one-semester Division of Basic Science core course in the basic biomedical sciences, unless that requirement is waived because of prior advanced education taken elsewhere. During the first year, students also participate in a minimum of 3 laboratory rotations. Students are expected to select a mentor that is a member of the Cancer Biology Training Faculty by June of their first year of study and then become officially affiliated with the Cancer Biology Graduate Program.

2. Program Core and Elective Courses:

Students in the Cancer Biology Program are required to take the requisite courses (1.5 credit-hours each). These are: Cancer Biology I (Molecular Mechanisms in Cancer Biology), Cancer Biology III, (Hypothesis-Driven Grant Writing) and Cancer WIPS. Students will take additional credit electives to accumulate a total of 9 credit hours of advanced coursework. These electives can include any advanced course offered by the Division of Basic Science including courses in Genetics and Development as well as other Cancer Courses and Journal Clubs. For example, Cancer Biology II (Stem Cells, Cancer and Cancer Stem Cells) would count toward the 9 credit hours. Journal clubs such as Hallmarks of Cancer, and Cytogenetics and Cancer do not count toward the 9 credit hours but do count toward the university minimal number of credit hours required each semester. Note that the full complement of 9 credit hours of advanced courses, with a 3.0 average or better, must be completed before a student can be admitted to Ph.D. candidacy. Typically, students are

expected to complete advanced coursework by the end of May of their second year although some credits may be deferred to the third year upon written/email permission from the Program Chair.

3. Alternative Curricula:

Some modification in the program course requirements can be made upon petition by the student. Such requests should be developed with the student's mentor and submitted in writing/email to the Program Chair which will require approval from the Steering Committee. Curriculum requirements for MSTP students may differ.

4. Other Activities:

All students are required to participate in a weekly seminar, a monthly dinner meeting, and in periodic symposia or retreats sponsored by the Cancer Center, including Cancer Grand Rounds. Even after the qualifying examination each student in the Cancer Biology Program must register for WIPs each year and participate by presenting a research talk at least one time per year. In addition, the required number of credit hours of research or other advanced courses must be adhered to as determined by the Graduate School.

C. Progress Towards the Ph.D. Degree

Following completion of the core course requirements for the Cancer Biology Program, each student will undertake an examination for candidacy for the Ph.D. degree. In order to advance to candidacy, (1) the student must complete all CORE course requirements as well as program course requirements in good standing (3.0 average or better); (2) the student must pass his/her qualifying examination; and (3) the student must have met at least once with their Thesis Committee. The schedule for meeting these requirements can be found in a time line at the end of this handbook. Once a student advances to candidacy, he/she must meet with their Thesis Committee at least once a year thereafter until the 4th year and afterwards the student must meet every six months.

D. Qualifying Examination

To take this examination, students must have at least one meeting with their Thesis Committee. Written documentation of this meeting indicating satisfactory progress of the student's research efforts must be on file with the program office (currently Karla Jerkins). The Chair of the Thesis Committee typically files this report but it is the student's responsibility to ensure that it is in their files. If the student's potential for laboratory research is judged deficient, the student may be barred from taking the Candidacy Examination.

To coordinate preparation for the qualifying exam, students must enroll in the requisite Cancer Biology III course, *Hypothesis Driven Grantsmanship*, which is scheduled to coincide with the qualifying exam process. The examination will have written and oral components and will be organized by the Qualifying Examination Overseer. A satisfactory written portion of the exam, approved by the Qualifying Examination Chair, is required before the student can take the Oral component of the examination.

1. Written proposal

On or around *February 8th* of the second year, each second-year student will submit to the Qualifying Examination Overseer Committee (currently Drs. Shay and White) a two-page long abstract of a research proposal. The proposal may or may not deal directly with the student's planned dissertation research. If the abstract is closely related to the planned dissertation research or other ongoing research in the mentor's laboratory this must be indicated on the abstract. Proposals generated for previous classes in the graduate program are highly discouraged. The proposal should deal with a topic relevant to a main theme of the Cancer Biology Program. The Exam Overseer Committee will evaluate the proposal so that, if necessary, a different abstract may be prepared for subsequent review and approval no later than *the first week of March*. The Exam Overseer Committee will appoint an *ad hoc* examination committee for each student, attempting as much as possible to match faculty expertise with the topic at hand. One member will be the chair who will work with the student on a regular basis throughout the preparation of the written proposal. Each *ad hoc* committee will have three members. A student's advisor may not be a member of the *ad hoc* examining committee. In general, a member of the Examination Overseer Committee will serve as an observer on the oral qualifying exam.

The NIH-style document will include a statement of purpose, a brief review of the literature, a list of proposed experiments and methods, and a discussion of the anticipated results, conclusions, alternative approaches, and likely directions for further investigation. The document shall be no longer than 10 pages, single-spaced, excluding references and figures, and should be limited to experimentation and analysis that can be completed in about three years by a graduate student. The document is to be written in English and must be clear and intelligible to all members of the qualifying exam committee.

Students are expected to consult with the chairperson of their examination committee while preparing the proposal. Consultation with the examination Chair is for the purpose of advancing scientific content and is not intended as a resource for help with writing skills. We stress that plagiarism is intolerable-

instances of this nature will be immediately referred to the graduate school Dean.

2. Oral Defense of the Research Proposal

All qualifying examinations will be scheduled over a 2-3 week period from late April to mid May. At least 2 weeks before the start of the Oral exams, all students will submit a printed document of the completed written proposal to all members of the Exam Committee for final approval. Students who are delinquent for this deadline will be permitted to take the Oral Exam at the discretion of the Qualifying Examination Committee and, at best, can only receive a conditional passing grade.

Prior to the oral examination, the committee will determine whether the written proposal is acceptable. The oral component of the examination will begin with a brief (10 or 15 minute) summary of the proposal by the candidate. Questioning by the committee members will generally follow that period, even though committee members can interrupt and ask questions during the oral presentation by the student. Any member of the graduate faculty (with the exception of the student's mentor) may observe this oral examination, but participation in questioning is limited to the members of the *ad hoc* examination committee. It is intended that questioning will deal with issues directly relevant to the proposed experiments including new or modified experiments developed during the examination and may include probing of the candidate's knowledge of basic principles underlying the experiments. A short break in the exam may be requested, for any reason, at the discretion of the Exam committee.

After questioning, the candidate will be excused and the assigned examination committee and observer will evaluate the quality of the candidate's proposal and its defense. In general, passing this examination will entail submitting a well-written, thoughtful and relatively complete proposal, successfully correcting or defending during the oral portion any shortcomings noted by the examiners and demonstrating a good grasp of the theoretical and technical foundations of the topic. One of these three areas may be somewhat flawed but deficiencies in more than one area are likely to result in a non-passing evaluation. **Even when a student passes the examination, the steering committee may stipulate specific activities (e.g., course work, supervised readings, rewriting of portions of the proposal, etc.) needed to correct a deficiency.** Passing the examination without any stipulations does not require a perfect performance in all three areas.

Upon completion of their deliberation, the committee will grade the examination performance as a **pass, conditional pass, deferred decision, or a failure**, and will inform the student of this evaluation. The Cancer Biology training faculty meet after the examination period to review all examinations and

determine the formal outcome of the exam based on recommendations from the exam committees. These deliberations are an important component that determines candidacy status. (See addendum for copy of the evaluation form).

The Exam Committee will specify the requirements necessary for converting a 'conditional pass' to a 'pass'. If a student fails either the written or oral components of the examination there are two possible outcomes: (1) the student will be allowed to retake the examination with the same committee on the same research topic, or (2) the student will not be permitted to continue in the Cancer Biology Program. An *ad hoc* committee charged with evaluating the student's overall performance in the graduate school to date will choose between these two alternatives. The composition of this committee will be determined by the Cancer Biology Program Chair and must exclude the student's Thesis advisor. The committee will evaluate the student's performance in course work and laboratory rotations. Reports from the student's mentor and the Qualifying exam committee will also be solicited. In the event of a failed qualifying exam, redeeming elements in these areas will be important parameters that determine the student's status. If approved, the second examination will be conducted by the original examination committee (if possible) and will take place within one month of the completion of scheduled oral exams in the program.

E. Supervision of Thesis Research

Prior to selection of their Thesis Committee, students in the training program will be advised by their mentors. By *December 1*, students must submit the names of their Thesis committee members and schedule the date of the first committee meeting to the Program Assistant (currently Ms. Karla Jerkins).

No later than *February 1* of the second year of study, each student will meet with a Thesis Committee. The Thesis Committee will consist of the student's mentor and three or more other faculty. Two of the four committee members must belong to the Cancer Biology Program faculty; all must be members of one of the graduate programs in the Division of Basic Science. The student's mentor may not chair the committee.

After forming the committee, but no later than *February 1*, the student will provide the committee members with a statement of the proposed Ph.D. research; a copy of that document will be submitted to the Program office and placed in the student's file. Not later than *February 1*, the student will meet with the committee to discuss the proposal. That meeting will include a roughly 30 minute overview of the project, including a summary of results obtained to date. The remainder of the meeting will be devoted to comments and constructive criticism by the committee members. The outcome of the meeting will be

summarized in writing by the committee chairperson and a report placed in the student's file.

The Thesis Committee will meet with the student at least once every 12 months during the dissertation research period until the fourth year. After the fourth year, the Thesis Committee will need to meet with the student at least once every six months. At least one week before each committee meeting, the student will distribute an updated research proposal, reviewing the goals, summarizing results obtained and problems encountered and stating major changes in the project (if any). Specific experimental plans and aims for the next 6-12 month period will be provided. The meeting will be devoted to evaluating the progress made and reaching a consensus regarding the proposed goals. It is expected that significant progress will be noted from one meeting to the next; if that is not the case, the committee will assess the problem and recommend solutions; solutions may include suggesting that another project be initiated, another advisor sought, or the program of study terminated. A written report of the outcome of each meeting will be submitted to the Program Chair and placed in the student's file (see attached form at the end of this handbook)

1. Admission to Candidacy

Admission to candidacy for the Ph.D. degree is defined by The Graduate School and should occur in the summer of the 2nd year. At minimum, it requires completion of the program course requirements in good standing (3.0 average or better), passing the Qualifying Examination and at least one meeting with a thesis advisory committee. To be formally registered as a thesis candidate, the student will submit an "Application for Candidacy for a Graduate Degree" form to the Division of Basic Sciences. The start date for admission to candidacy for the Ph.D. is considered as the last day of scheduled oral examinations for Program students in a given year, typically in the third week of May, regardless of when all requirements are finally met by any given student.

2. Preparation and Defense of Dissertation

a. Preparation of Dissertation

When a student and advisor decide that the program of research is nearly complete, the Research Advisory Thesis Committee is converted into the Dissertation Examination Committee. The committee will review a detailed dissertation outline generally about four to six months before the proposed date of the dissertation defense. Based on that review of the outline, any required additional data, including improvement of the quality of key data, will be identified and stipulated in writing.

No later than two weeks before the oral defense the student will submit to the Dissertation Examination Committee a complete draft of the dissertation, including all figure and tables (including legends) and references, which has been reviewed and approved by the mentor. The exam will be scheduled sufficiently in advance of the date to permit advertisement in the appropriate calendars and bulletin boards of the institution; advertising will be arranged by the Program must be initiated by the student.

b. Defense of Dissertation

The oral examination of the dissertation has two components. The first is an oral presentation of the main findings of the dissertation, roughly 45 minutes in length and will be open to the public. About 15 minutes additional is reserved for replies to questions from the floor. The second component is the actual defense of the dissertation. Participation in it is restricted to the members of the Examination Committee, although any member of the graduate faculty may observe. The advisor is present during the examination but is expected to permit the candidate to defend the dissertation without assistance.

Upon completion of the questioning, the candidate and any observers will leave the room and the committee members will reach a consensus regarding the outcome of the examination. After sufficient discussion of the merits of the candidate's defense of dissertation, a vote will be taken. The examination is passed by unanimous approval of the defense; even so, committee members may withhold their signature until specific changes are made in the dissertation document. When all committee members have signed the approved thesis, it is the student's responsibility to provide bound copies with original figures to the Graduate School (two copies required), the student's advisor, and the Cancer Biology Graduate Program, as well as to any Dissertation Examination Committee members requesting a copy. In addition, a PDF version of the dissertation may also be required.

3. Dismissal Policies

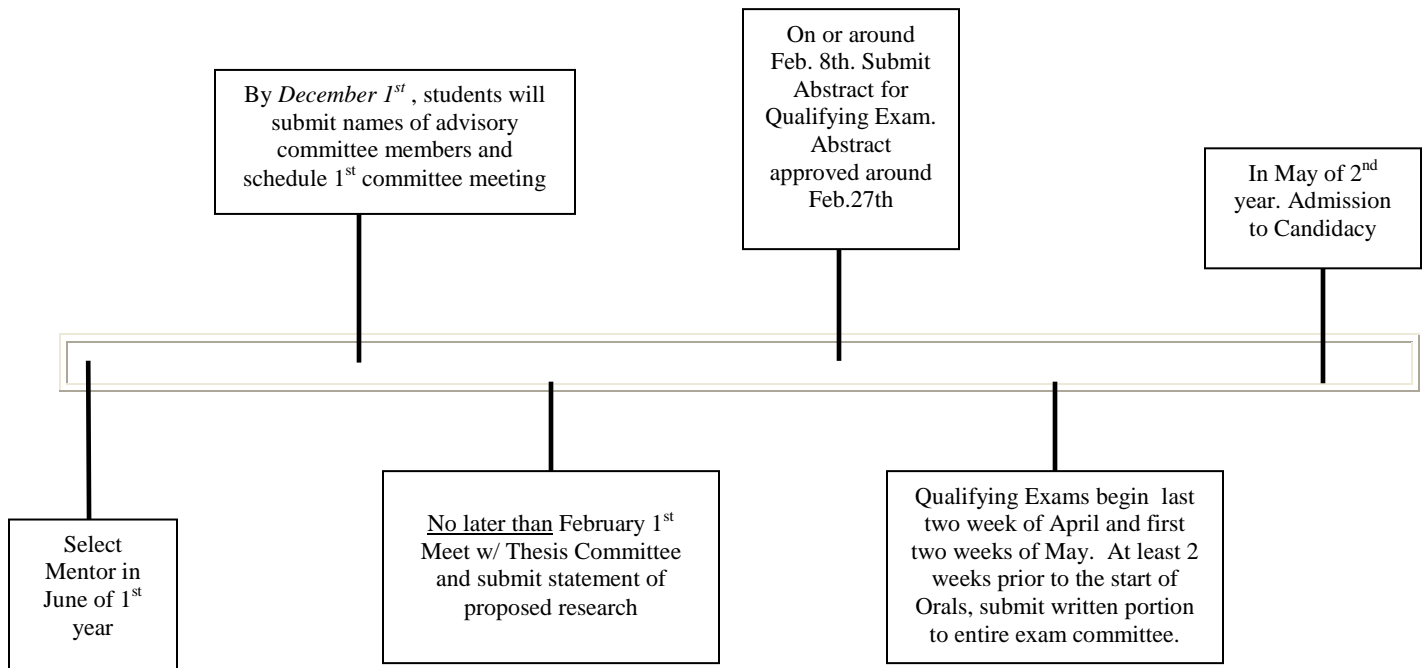
a. Poor performance on course work

A 3.0 average in Program core courses and elective courses is required to remain in good standing. Any grade of C or U must be offset by a grade of A or S, respectively, in the same course or in another course of similar credit. No more than two courses can be replaced in this fashion. Poor performance in second-year course work will usually result in a recommendation from the Program that the student be placed on "academic probation" by the Dean of the Graduate School. Failure to be restored to good standing within a stipulated period of time will lead to dismissal. Each student must meet all seminar and research colloquium requirements with a satisfactory performance and on

schedule; noncompliance with these requirements may result in the student being placed on academic probation or in dismissal from the program.

b. Poor performance of dissertation research

As noted above, students are required to meet regularly with their Research Advisory Committee to review progress. A finding of poor performance in the laboratory will usually result in a grade of U in research and may lead to academic probation. Failure to improve research performance will usually result in the termination of the student's doctoral studies. Negative assessments of research performance may be appealed in writing to the Steering Committee.



SCHEMATIC TIME LINE FOR SECOND YEAR CANCER BIOLOGY GRADUATE STUDENTS

Objectives & Evaluation Criteria: Cancer Biology Qualifying Examinations

The qualifying examination (QE) tests whether the student is adequately prepared to proceed with dissertation research and enter candidacy for a Ph.D. This requires a base of scientific knowledge and an ability to apply this knowledge to the formation of viable hypotheses and the development of plans to answer the questions posed by the hypotheses. Evaluation of the student's basic readiness will focus on four general areas indicated below. The qualifying committee will judge whether adequate progress has been made to pass each area. Satisfactory (not perfect) performance in all four areas is required to pass the QE and meet this requirement for Admission to Candidacy for the Ph.D. The final results will be either PASS or FAIL. If students receive a FAIL they will have a chance to repeat part or all of the written and/or oral exam. The committee chair should complete this form, scan it if possible and email to Karla Jerkins (Karla.Jerkins@UTSouthwestern.edu), Education and Program Assistant for the Cancer Biology Program (or send by campus mail to MC 8590). Please copy Jerry Shay (Jerry.Shay@UTSouthwestern.edu) Program Chair on the email.

_____ **1. The written proposal demonstrated an ability to define novel research goals and develop a plan to test hypotheses generated; this plan is presented logically and clearly in the defined format.**

_____ **2. The student demonstrates assimilation and application of basic scientific knowledge; this includes both general knowledge and specific information related to the research proposal.** Basic knowledge includes all material the student has experienced in various courses (especially the CORE and program courses) and information that should have been acquired while working in the laboratory environment or being associated with the scientific community at UT Southwestern. Specific information includes functional familiarity with the literature in the area of the research proposal and the systems to be utilized for the research plan.

_____ **3. The student demonstrates an ability to develop alternative hypotheses and approaches during the exam.**

_____ **4. The student demonstrates mastery of procedures, protocols and appropriate controls for proposed experimental paradigms.** This includes a fundamental understanding of both the theory and practical implementation of experimental procedures and capability to justify use of alternative procedures based on their advantages and pitfalls. Evaluation will take into account the potential lack of practical experiences of the student, but this should be countered by an appropriate ability to make adjustments when confronted with new information/considerations.

Student name: _____

Committee Chair: _____ Date _____

Committee members _____

Hypothesis Testing Grant Writing Course

Timeline for Qualifying Exam

You should already have a thesis committee.

You need to meet with the thesis committee before oral exam is permitted.

For Cancer Biology Program students, you must meet with your committee by Feb 1st and you must have written documentation of this meeting.

You must attend and participate in all required meetings of the Hypothesis Driven Grant Writing Course as per the schedule you will be given. You must also meet all deadlines.

Purpose of the Qualifying Exam

The qualifying exam tests whether the student is adequately prepared to proceed with dissertation research and enter candidacy for a Ph.D. This requires a base of scientific knowledge and an ability to apply this knowledge to the formulation of viable hypotheses and the development of plans to answer the questions posed by these hypotheses. Evaluation of the student's basic readiness will focus on four general areas

How Students will be Evaluated on the Qualifying Exam

1. The written proposal demonstrates an ability to define novel research goals and develop a plan to test hypotheses generated; this plan is presented logically and clearly in the defined format.
2. The student demonstrates assimilation and application of basic scientific knowledge including both general knowledge and specific information related to the research proposal.
3. The student demonstrates an ability to develop alternative hypotheses and approaches during the exam.
4. The student demonstrates mastery of procedures, protocols and appropriate controls for proposed experimental paradigms.

General Tips for Preparing Grant Proposals

- Talk to exam committee chairperson throughout the writing process (and others as you wish)
- Talk to other students that have completed the process
- Take ownership of your training by utilizing all resources available and making a strong effort to learn from this process
- Read and become familiar with the literature cited in the written proposal

Cancer Biology Program

Thesis/Dissertation Committee Meeting Progress Report

Date: _____ Semester: Spring Fall Summer
Circle One

Student: _____ Year in School: 2 3 4 5
Last Name, First Name, MI Circle One

Mentor: _____ Meeting No. _____

Committee Chairperson: _____ Progress: Satisfactory/Unsatisfactory
Circle One

Committee Members: _____

1. List the projects that the student has been working on since the last meeting and explain the progress that has been made. (Please attach additional documentation or student hand out).

2. What are the plans/goals for the future?

3. When will the next thesis committee meeting be?

4. Committee: concerns about thesis project, student making timely progress, ability to design, conduct, or interpret experiments etc).

5. Mentor comment: status of the student's motivation, technical ability, and potential (e.g. making good progress, there are concerns (list them), there are major problems that need to be discussed)

