Cancer Biology PhD Program

GRADUATE SCHOOL
UNIVERSITY OF COLORADO
DENVER| ANSCHUTZ MEDICAL CAMPUS

Student Handbook

2025-2026

2024 Retreat at Cheyenne Mountain Resort

CANCER BIOLOGY PhD PROGRAM
University of Colorado Anschutz Medical Campus 12801 E. 17th Ave.,
MS 8116
Aurora, CO 80045
https://www.cuanschutz.edu/graduate-programs/cancer-biology/home

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Program Guidelines Disclaimer

As a member of the [Program name] PhD Program, you are expected to adhere to all established policies and procedures of the University, the Office of Research Edcuation, the Graduate School and this PhD Program.

CU Anschutz – University Policies	https://catalog.ucdenver.edu/cu-anschutz/university-policies/
Office of Research Education	https://medschool.cuanschutz.edu/ore/forms-and-resources
Graduate School	https://graduateschool.cuanschutz.edu/forms-resources/resources

For any policies, please make sure to review the Graduate School Policies and Procedures.

Program Overview

GOALS OF THE PROGRAM

The goal of the Cancer Biology (CANB) Program is to provide interdisciplinary training at the cutting edge of cancer research so as to best prepare students to compete in a biomedical research environment increasingly focused on translational applications of basic science research. While the primary focus of the Cancer Biology Graduate Program is basic science and translational research, students will also be exposed to many aspects of clinical science as they relate to the study of cancer, including cancer therapeutics, epidemiology and prevention. After the initial period of coursework, students choose their specialty fields from a diverse list of mentors and topics. The Program draws on faculty from many different departments within the medical campus and offers a wide range of research opportunities. Students proceed with research in their specialty areas until the generation and defense of a thesis leads to the award of a Ph.D. in Cancer Biology.

GRADUATE ADVISORY COMMITTEE (GAC)

During the first year, CANB students will meet with their GAC mentor individually or as a group at the beginning of each rotation to discuss the student's progress in the Program and to address any issues that may arise. The CANB graduate students will meet as a group with Dr. Schweppe and the GAC chair

quarterly to discuss issues relevant to the program. The students will be expected and encouraged to seek advice from the Program Director, GAC advisory, and/or other Cancer Biology faculty members prior to lab rotations, the Comprehensive Exam, and at other times when the student requires faculty consultation. Students are expected to choose rotation faculty from an approved list of faculty members provided by the program. If a student would like to rotate with a faculty member who is not on the list of approved faculty, please contact the Program Directors as soon as possible for approval. Useful information for rotations is included in **Appendix 10**.

Office of Research Education Contacts

Professor and Program Director: **Rebecca Schweppe, PhD**

- Phone: 303-724-3179
- Email: Rebecca.schweppe@cuanschutz.edu

Program Co-/Associate Director: Benjamin Bitler, PhD

- Phone: 303-724-0574
- Email: Benjamin.bitler@cuanschutz.edu

ORE Program Administrator: Evelin Zumba

- Email: Evelin.zumba@cuanschutz.edu

Office of Research Education (located in the Fitzsimons Building, 5th Floor West, Suite W5107)

Angie Ribera: Associate Dean of Research Education, angie.ribera@cuanschutz.edu
- Point of contact for faculty, program, and organizational concerns and planning

Jodi Cropper: Business Services Program Director, jodi.cropper@cuanschutz.edu
- Point of contact for financial and organizational planning concerns and coordination
- Point of contact for student and related concerns

Morgan Texeira: Program Manager, morgan.texeira@cuanschutz.edu
- Point of contact for program specific concerns and additional point of contact for Program Administrators

Stephen Frazier: Business Service Professional, stephen.frazier@cuanschutz.edu
- Point of contact for ORE administrative concerns, organizational planning and ORE leadership availability

BSP & MSTP Requirements

Students transferring to the Cancer Biology PhD Program from the Biomedical Sciences (BSP) or Medical Scientist Training (MSTP) programs may have different credit/course requirements (**See Appendix 1**). Applications for transfer will be evaluated based on thesis lab availability, transcripts, and performance on the preliminary exam and in rotation labs. It is important to understand that transfer from either

program into the Cancer Biology PhD Program depends on a Cancer Biology PhD Program faculty member agreeing to accept the student into her/his lab for their thesis work.

MSTP Students should enter a thesis lab with 27-33 graduate credits, including graduate core. They have also completed/will complete the MSTP Preliminary Course focused on grant writing in Spring term of their transfer year. This course covers F31 grants, but also F30 grants which are specific to dual-degree trainees. The MSTP administration will review student transcripts with the PhD Program Administrator at time of transfer and will confirm that all expected graduate credits have posted for program review and evaluation.

MSTP students have already selected and been accepted into a thesis lab within the selected PhD program. They will enter the program under this lab's support immediately upon transfer and should not incur charges to the PhD program at any point in training absent the need for gap funding/support. As such please consider this transfer to be equivalent to a second year PhD student. Time to degree is a very important metric for the NIH and the program's T32 grant. MSTPs are expected to complete their PhD training within four years of entering lab. Of course, mitigating circumstances can occur. The MSTP Administration should be alerted to any significant progress concerns which may impact a student's ability to graduate within the expected time frame. This can be accomplished by meeting, email, or committee meeting notes as appropriate.

- MSTP students should contact MSTP Administration to obtain the program specific lab mentor agreement to review lab mentor responsibilities, curriculum requirements and other expectations related to the research portion of training. **MSTP students must have thesis committee meetings every 6 months** regardless of their PhD program. Each MSTP student's thesis committee should have a faculty member representing MSTP. Students should discuss MSTP faculty representation with the Director or Associate Program Director to identify suitable candidates.
- Throughout the Thesis stage of training, MSTPs are required to register for the *Longitudinal Foundations of Doctoring* (FOD) course in 2 terms annually (Fall and Spring). They will enroll into the *Capstone Return-to-Clinics* course in their last year of thesis training, replacing FOD in the spring term. The MSTP mentor is responsible for covering the costs for these courses and agrees to this as part of the MSTP-specific mentor letter.

Curriculum Overview

Registration Process

- **Academic Calendars** (see The Graduate School calendar)
- **Register for Classes** (see The Graduate School)
    - All basic science PhD students must register in a minimum of 5 credits (fall and spring semesters), 1 credit of 8990 (summer semester), and anything above the minimum credit level will need approval from faculty mentor.
    - First year students, BSP and MSTP students should work with their Program Directors, program administrators, and faculty mentors as there will be additional credit requirements associated with their progress in the program.

- The paying of tuition, fees and student health insurance occurs the week following the deadline for semester add/drop period, which can be found on the academic calendar . The Program Administrator will complete the process of submitting the appropriate form to the Bursar's Office. For those students receiving financial aid, please work with the Program Administrator to avoid any disruption in aid awarding.

Year 1

Fall Semester		
Course Title	**Registration Information**	**Credits**
Foundations in Biomedical Science	BMSC 7806	6
Core Topics in Biomedical Sciences – A (student may select topic)	BMSC 7810	2
Core Topics in Biomedical Sciences – B *Cancer Biology – required by program*	BMSC 7810	2
Responsible for Conduct of Research	BMSC 7811	1
Rotation 1	CANB 7650 (001)	1
Rotation 2	CANB 7650 (002)	1
Cancer Biology Journal Club	CANB 7613 (001)	1
Research in Progress Seminar	Attendance Required	0

First year students will register for two sections, one section in Core Topics A (Section 001-005) and one section in Core Topics B (Sections 006-010). Each section is a 3-week intensive special topics course, the Core Topic A sections start immediately after BMSC 7806 followed by Core Topic B sections. Course offerings vary by year but include Core Topics courses in immunology/microbiology, stem cell and regenerative medicine, developmental biology, cancer biology, and exploratory data analysis in R/R Studio. An updated list of the course offerings will be provided to students prior to registration in the fall. CANB are **required** to take the section offered by the CANB program, "Principles of Cancer Biology". Please see descriptions below. First-year students who would like to take Core Topics offerings other than the options that are strongly encouraged should consult with the Program Director prior to enrollment.

**BMSC 7810 Core Topics in Biomedical Sciences: *Students can select any one topic from the Core Topic A list*

(2 credits). CANB students must select Principles of Cancer Biology as their Core Topic B (2 credits) = 4 credits

in total

Core Topics B – November 21 – December 12, 2025 Sec 011 – Principles of Cancer Biology (REQUIRED) Course Director: Dr. John Tentler

Spring Semester

Course Title	Registration Information	Credits
Molecular Mechanisms of Cancer Biology	CANB 7600	4
*Pathobiology of Cancer	CANB 7610 or 7611	1
**Grant Writing in Cancer Biology	CANB 7690	1
Rotation 3	CANB 7650 (001)	1
Electives (as desired; see **Appendix 3**)		variable
Summer Semester		
Course Title	**Registration Information**	**Credits**
Doctoral Thesis	CANB 8990	1
Research (Pre-Comps) if instructed to register for 4th rotation	CANB 7650	3

***MSTP** students in the CANB program are exempt from CANB 7610/7611 and CANB 7690.
****CANB** students must complete five semesters of CANB 7613 with one semester of CANB 7690 counting towards the overall total of six required semesters.
***BSP students must complete four semesters of CANB 7613 with one semester of BSP 7613 and one semester of CANB 7690 counting towards the overall total of six required semesters.

- **Rotations**
  - **Laboratory Rotations**. Students must perform three rotations before the start of their second year. Rotations enable the student to explore and compare several areas of cancer biology research and aid in the choice of a mentor and project for thesis work. Rotations also allow program faculty to evaluate the motivation, technical skills, and intellectual preparedness of students to undertake independent research. Please see **Appendix 10** for Rotation resources.
  - **Rotation Selection:** Students start their first rotation in the fall semester, spending three months in each of three laboratories. We encourage you to set up your first rotation prior

to arriving on campus. Please reach out to your GAC advisor, Dr. Bitler (GAC Chair), or Dr. Schweppe (Program Director) regarding selection of rotation mentors. Your peer mentor and current students are an excellent source of advice as well. We strongly recommend that you wait until you are on campus before you set up your second and third rotations. We have program events at the beginning of the academic year that are designed specifically to highlight the wide variety of research opportunities available in cancer biology. **Students are expected to select mentors from an approved list of rotation mentors within the cancer biology program for all three of their rotations.** Potential faculty mentors should be contacted several weeks or more before the start of the rotation. MSTP students do two rotations in total, during the summers of the first and second year of Medical School.

- **ORE Milestone Rotation** Request form to be used when first year students have identified their rotation mentor. Please follow Program specific guidelines, including the submission deadline. Three forms will be submitted throughout the academic year.
- **Rotation Expectations:** For professionals in training, it is not appropriate to require a minimum number of hours for rotation work. Strong self-motivation is an absolute essential characteristic for an independent scientist, and we expect our students to demonstrate this quality throughout their training. In this regard, students should expect to frequently be in the lab beyond the normal working hours, i.e. in the evening, on weekends, and possibly over vacation days during the term. In order to maximize the success of your rotation, we require setting up regular meetings with your faculty rotation mentor, require drafting the specific aims and hypothesis with your mentor, and presenting your aims, hypothesis, and data in lab meetings throughout your rotation. An Aims page that is approved by the mentor must be submitted to the program within **2 weeks of the start of each rotation**. A major part of the mentor's rotational assessment (as well as his/her willingness to accept a student) will be based on the degree and quality of lab effort. At the same time, it is critical for students to keep up with their coursework and to pass examinations. Students should always discuss time off and/or vacation days with their lab mentor in advance, both in their lab rotations and once they enter a thesis lab. A short-written evaluation of the student's rotation will be provided by the rotation mentor (**See Appendix 10**). We strongly encourage students to meet with their rotation mentor to discuss their evaluation. Rotation grades are assigned by the rotation mentor following the rotation seminar.
- In order for the student to continue in the program, the student is expected to find a thesis lab after three rotations. **A fourth rotation may be requested but you must request approval from your Program Director.** The Program Administrator and Program Director will work with the Office of Research Education accordingly.
- **Rotation Seminar:** At the end of the rotation the student will present a post-rotation seminar. This seminar is an essential component of the research rotation and should be prepared with the help of the research mentor. Rotation seminars are 10-12 minutes in length with up to 3 additional minutes for questions. **See Appendix 10** for the rotation talk evaluation form.

- **Research Update Talks**-Research In Progress (RIP) Seminar
  - Required to attend in-person seminars
  - Thursdays, 10:30am – 11:30am
- **Preliminary Exam**
  - Preparation for the preliminary exam begins at the end of spring courses. The exam is administered in early to mid-June (date determined on year-by-year basis). Refer to **Appendix 2**.
  - If you are a BSP student and have selected to join CANB Program you will take your Prelim with the CANB cohort.
  - The University of Colorado Graduate School and the Cancer Biology PhD Program requires two exams for students, a Preliminary Exam and a Comprehensive Exam. Cancer Biology students, like most basic science graduate students, take a Preliminary Exam in June at the end of their first-year coursework. The format of this exam will be determined by the steering committee and may be changed at any time on the recommendation of the steering committee. The exam is not designed to test rote memory but instead to determine whether students can integrate their knowledge so that they can formulate scientific questions and understand how to test them. The goal of the preliminary exam is to catch deficiencies and provide a holistic evaluation of each student. Then, deficiencies can be addressed by the mentor/mentee pair prior to the comprehensive exam. Exact details will be given several weeks in advance of the exam. Continuation in the program is dependent on the student achieving a passing score. Under exceptional circumstances, a student who fails the preliminary exam may petition the CANB Steering Committee and may be allowed to retake all or part of the exam. The decision of the Steering Committee will be final. Please see **Appendix 2** for the exam rubric.
  - MSTP students' preliminary exams are equivalent to CANB preliminary exams.
- **Transferring Thesis Lab**
  - **Predoc Financial Support Agreement** for those faculty mentors who choose to take on a new predoctoral mentee.
- **Residency**
  - Per University policy, it is required that students begin the process of establishing their residency as soon as they accept their offer to join the PhD program. This process must be started promptly to ensure you meet the necessary deadlines by the end of your first year. For more information, please visit the University website – **Residency**

Year 2

- Minimum registration requirement for full-time graduate students is 5 credits. Anything above 5 credits must be approved by faculty mentor.

Fall Semester		
Course Title	**Registration Information**	**Credits**
***Introductory Biostatistics	BMSC 7820	3

Research (Pre-Comps)	CANB 7650 (sec 0V3)	1-5 (variable)
**Cancer Biology Journal Club	CANB 7613 (002)	1
***Electives (as desired)		variable
Research In Progress seminar	Attendance Required	0

*All students (including MSTP) are required to take a biostatics course. Other biostatistics courses may fulfill this requirement upon approval of the Program Director and Associate Director.

**BSP or MSTP students joining CANB may count BSP journal club or Molecules & Medicine, respectively, toward one semester of CANB Journal Club requirements. If there is a conflict between Journal Club and an elective or other required class, it is possible to take your final semester of Journal Club later. Reach out to the Journal Club Director and Program Directors to confirm.

***BSP and MSTP students who did not take Responsible Conduct of Research (BMSC 7811) will take this course in the fall of their 2nd year.

***At least 3 credits of electives are required for this program. More can be taken if desired. **The elective requirement should be completed by the end of your 2nd Year.** Note: the purpose of the elective is to expand your knowledge base beyond cancer biology. Therefore, no more than one elective credit can be from a special topic in cancer biology course. Please contact the Program Director if you have any questions regarding this requirement. You can find a list of past electives other students have taken that count toward this requirement in **Appendix 3** of the Handbook. MSTP students have typically met the elective requirement upon entering the program, which should be verified with the Program Director.

Spring Semester

Course Title	Registration Information	Credits
Research (Pre-Comps)	CANB 7650 (sec 0V3)	1-5 (variable)
*Pathobiology of Cancer	CANB 7610 or 7611	1
Cancer Biology Journal Club	CANB 7613	1
Electives (as desired)		variable
Research In Progress seminar	Attendance Required	0

***MSTP** students in the CANB program are exempt from CANB 7610/7611

Summer Semester

Course Title	Registration Information	Credits
Doctoral Thesis	CANB 8990	1

Important: A student must **complete or be registered for in the semester of their comprehensive exam, 30 credit hours** (not including CANB 8990 hours) before taking the exam. Any student passing 30 credits of course work that has *not* taken his/her comprehensive exam must continue to register for CANB 7650-0V3 until the exam is taken; or the student may appeal to the Program Director, Associate Director and Program Advisor for permission to start registering for CANB 8990.

Following the completion of the required coursework and Comprehensive Exam, students will register for the appropriate credit hours of CANB 8990 to maintain full-time status until the thesis defense. (Note: another 30 credit hours of Doctoral Thesis (CANB 8990) are required **before** defending, so switching as soon as the requirements are completed is prudent).

- **Research Update Talks**: Research In Progress (RIP)
  - Required to attend in-person seminars
  - Thursday, 10:30am-11:30am
- **Comprehensive Exam:** Students may take their comprehensive exam as early as the summer semester in Year 2, but must take the exam before the start of the second semester of Year 3. See section (E.) Comprehensive Exam, and **Appendix 4** for details regarding the exam format and preparation. A meeting with the GAC Chair will be held in the summer/fall of the 2nd year to review the policy and procedures surrounding the comprehensive exam.
  - **Required forms** to be completed using DocuSign
    - Application for Candidacy form
    - Exam Request form
    - Once a date has been set with your Thesis Advisory Committee, you must contact your Program Administrator to initiate forms. You will also discuss room bookings at this time. All forms must be submitted to the Administrator at least a month prior to the exam date.
- **MSTP Specific:** Please work with MSTP Administration and PhD Program Administration to complete the required mentorship agreement for transitioning into a lab.

Year 3

- Minimum registration requirement for full-time graduate students is 5 credits. Anything above 5 credits must be approved by faculty mentor.
- Students defending in the current semester must register for 5 credits of CANB 8990. If a student is defending between semester dates as defined by the Academic Calendar, the student must register for 5 credits of (Program) 8990, in the proceeding semester of the scheduled defense date.

Fall Semester		
Course Title	**Registration Information**	**Credits**
Research	CANB 7650 (0V3) or CANB 8990 if post-comps	1-5 (variable)
Electives (if applicable)		Variable
Cancer Biology Journal Club	CANB 7613	1

Research In Progress seminar	Attendance Required	0
Spring Semester		
Course Title	**Registration Information**	**Credits**
Doctoral Thesis	CANB 8990	1-5 (variable)
Electives (if applicable)		Variable
Cancer Biology Journal Club	CANB 7613	1
Summer Semester		
Course Title	**Registration Information**	**Credits**
Doctoral Thesis	CANB 8990	1

Year 4 (and beyond)

Course Title	**Registration Information**	**Credits**
Electives (as desired)		variable
Doctoral Thesis	CANB 8990	Up to 5 credits
*Cancer Biology Journal Club	CANB 7613	0

*Students are not required to register for Journal Club after the first semester of their 4th year (or after 6 completed semesters of registration), but it is expected that they will continue to attend.
Ethics Refresher Course: An eight-hour refresher course is required for all students every 4 years. This means all our **5th year students** will take BMSC 7811 to fulfil this requirement. Registration is not required but you will need to contact the Program Administrator for more information on sitting in on the course.

Summer Semester		
Course Title	**Registration Information**	**Credits**
Doctoral Thesis	CANB 8990	1 credit; 5 credits if you are defending in the summer

- Research Update Talks
  - Required to attend in-person seminars
  - Thursday, 10:30am- 11:30am
- Thesis Committee meetings
  - CANB students are required to attend annual thesis committee meetings

Examinations and Evaluations

Preliminary Exam

- Every first-year student takes the Preliminary Exam at the end of the first year of graduate school. BSP students that plan to join **CANB** will participate in the program's preliminary exam.
- MSTP trainees transferring into **CANB** current preliminary exams are accepted as an equivalent to the program preliminary exam. MSTP trainees will complete an MSTP specific preliminary exam prior to program transfer. (**See Appendix 1**).
- **Transfer to Thesis Lab.** An important aim of the rotations is to enable the student to find a thesis mentor. Within one month of the completion of the three rotations for regular graduate students or two rotations for MSTPs, the student should come to a mutual agreement with a faculty member to act as thesis mentor. The Student Advisor and the Program Director must formally approve the choice of a thesis advisor. Under some circumstances a co-mentor (co-advisor) may be required by the Program. Co-mentors must be full training faculty in the Program. The co-mentoring plan must be approved by the Program Director, Associate Director and Student Advisor (a template is available from the Program Director). **Official transfer to the thesis lab takes place on July 1.** Under exceptional circumstances and at the discretion of the Program Director, a student may be allowed to perform an additional rotation for the express purpose of enhancing the mentor selection process. Although the Program will assist the mentor selection process, it is ultimately the student's obligation to identify a thesis lab by the beginning of the second academic year. Failure to identify a suitable lab by this time will result in dismissal from the Program. Upon entering a thesis lab, it is highly recommended that the mentee and mentor develop a compact as a framework or developing a positive mentoring relationship. Please see **Appendix 12** for an example of Mentor and Mentee mutual expectations and a Mentor-Mentee compact from the AAMC.

Comprehensive Exam

- **Comprehensive committee formation** (**See Appendix 4**)
    - Successful completion of the Comprehensive Exam admits the students to Candidacy for the Ph.D. degree in Cancer Biology. This exam can be taken as early as the spring semester of the second year, but is usually taken in the fall semester of the third year. The exam must be completed by the end of the fall semester of the students' third year. It is highly recommended that the student carefully read the Graduate Student Handbook on Comprehensive Exam policies and deadlines and complete the required forms from the Graduate School (Request for Examination and Application for Admission to Candidacy) well ahead of the planned examination.
- **App Candidacy form**
- **Exam request form**
    - Once a date has been set with your Advisory Committee, you must contact your Program Administrator to initiate forms. You will also discuss room bookings at this time. All forms must be submitted to the Administrator at least a month prior to the exam date.
- As you prepare for your Comprehensive Exam, please ensure that all your committee members have a faculty appointment listed in the **Graduate School Faculty Directory.**

- All forms are found in the Graduate School website under the "Forms" section.
  - **Graduate School - Resources & Forms - CU Anschutz**
- AI Policies for Comprehensive Exam **Appendix 6**

Thesis Defense

- **Thesis committee formation** (**See Appendix 7**)
  - By February 1 of their 3rd year, students must establish a Thesis Committee and communicate this to the Program Administrator, Program Director and the Student Advisor. The specific composition of the committee should be determined in consultation with their thesis advisor and approved by the Program Director. In most cases this committee will be identical or similar to the comprehensive exam committee. The purpose of the committee is to guide and evaluate the progress of the student during their thesis research. It cannot be emphasized enough, however, that each student is ultimately responsible for his/her own progress. The committee should be composed of four CANB faculty members and one faculty member from outside the program. A committee of three CANB faculty and two outside members is allowed with the approval of the Program Director and Associate Director. The thesis advisor is not a voting member of this committee. The Chair of the thesis committee must be a member of the Cancer Biology Program; he/she serves as the advisor to the student and monitors their progress. Any changes to the thesis committee must be discussed and approved by the committee chair and the Program Director. Students are required to meet with their committee at least once each year; however, it is HIGHLY recommended that the committee meet every 6 months and more frequently in the year prior to the thesis defense.
  - Final defense of the thesis/dissertation must be completed by Graduate School deadlines.
- **Thesis Research:** Students will generate an original body of research that constitutes a significant contribution to the field of cancer biology. The student and faculty member together plan a thesis project; however, the thesis research is the responsibility of the student, who must be able to conceive, carry out and write up (a thesis) a significant body of work in a logical manner. Doctoral level work requires a close collaboration with a faculty mentor; it is the responsibility of the student to establish and maintain that relationship. Program faculty are always available for consultation and advice; however, it is the responsibility of the student to seek them out. It is worth repeating that strong self-motivation is an absolutely essential characteristic for a successful scientist. Students should expect to frequently be in the lab beyond the normal working hours, i.e. evenings, weekends, and possibly over vacation days during the term. Students should always discuss time off and/or vacation days with their lab mentor in advance, both in their lab rotations and once they enter a thesis lab. Note: All notebooks, original data and reagents from rotational and thesis work are the property of the advisor and must be left with the advisor at the completion of the work.
- **Update Talks:** Students will give an annual report on the progress of their thesis research to the Cancer Biology Faculty and Students in the form of a 30-minute seminar once every academic year beginning in their 2nd year. The update talk should include one slide on rigor and reproducibility of the research presented. For example, briefly describe how cell lines and key reagents were authenticated, and what statistical methods were used. The update talk should be coordinated with the thesis committee meeting. It is the responsibility of the Committee Chair to post a brief critique of the yearly seminar on Predoc Progress Assessment web site -

http://predocprogress.ucdenver.edu/ . Students actively writing their thesis may be exempt at the discretion of the Program Director.

- **Publication Requirement:** Publications are the culmination of the research done in the lab. It is the obligation of all scientists to share their findings with their peers and the public. **Students are required to have at least one primary, first-author paper submitted and in review at a peer-reviewed journal at the time of their thesis defense. The student's manuscript should be the focus of their thesis work. Under exceptional circumstances, co-first author publications may fulfill this requirement with approval of the steering and thesis committees. The decision to let the student defend is at the discretion of the thesis committee and student's mentor.**
- Biosketch Form
  - This is a graduate school form, not the NIH form
- Exam Request
- Thesis Approval form
- Refer to Program Specific Guidelines in **Appendix 7**
- Thesis and Dissertation Guidelines
- ProQuest **General Information for Submitting Dissertation & Thesis** page 13 on Graduate School website
- Watch how to prepare the correct forms and upload your dissertation.
- AI Policies Guidelines for writing the Thesis.
- If defending after the semester ends you must register for 5 credits of 8990 in the proceeding semester. (Thesis defenses must be tied to the end of the semester deadlines dates please see the links below)

You can find all forms for the comprehensive exam and thesis defense on the Graduate School website under the "Forms" section.

- Graduate School - Resources & Forms - CU Anschutz

Thesis Defense Resources and Dissertation Guidelines

- Thesis & Dissertation/ProQuest Format & Guidelines
- Graduate School Deadlines, Forms, Policies
- See **Appendix 7 f**or program specific guidelines

Policies and Procedures

CANB Program Specific Obligations

- **Program Transfer**
  - For students matriculating directly into Basic Science Programs, there is an expectation that you will remain in that Program. You have matriculated into that Program by virtue of having applied and being accepted. Thus, there is a substantial bilateral commitment. Transferring from a Program, at any point, is actively discouraged. If there are issues with an individual mentor or a perceived lack of research laboratory options, it is expected that solutions will first be explored within the Program. Program transfer will only be approved under

exceptional circumstances, and then only after successful completion of the preliminary exam at the end of the first year.

- **Attendance**
  - All graduate students are required to attend post-rotational seminars and Thesis Defense Seminars of the other students in the program. All students are also required to attend the Cancer Biology Research in Progress series and annual retreat.
- **Student's File**
  - A file for each student will be kept by the Program Administrator. All relevant records should be given or emailed to the Program Administrator for the files, including published abstracts and papers, notifications of awards and honors, and copies of forms filed with the Graduate School. These files should reflect the total record of the student during his/her entire graduate career. The records can be examined by the student at any time.
- **Participation in Recruitment Functions**
  - During January/February/March each year, prospective student applicants visit our program for interviews. It is in the Program's best interest to attract and retain the best of these prospective students. To do this we need the help of current students and Cancer Biology faculty who can convince these individuals that our Program is the best for pursuing a Ph.D. in cancer biology. When asked, please be willing to spend some time with prospective students during dinners or other functions. Our Cancer Biology Program can only flourish with your help.
- **Vacation and Holidays**
  - Graduate students shall receive all CU Anschutz campus holidays and may receive an additional 10 weekdays (excluding weekends) of vacation per academic year, with no year-to-year accrual. Graduate students shall continue to receive stipends during vacations and holidays. Graduate students taking courses are expected to attend all classes and take all exams as scheduled. The times between academic terms and the summers are all considered active parts of the training period and leave must be taken in accordance with this policy. Graduate students supported via extramurally funded projects or training grants must comply with sponsor requirements regarding effort.
- **Sick Leave and Other Leave**
  - Graduate students may continue to receive stipends for 11 weekdays (excluding weekends and campus holidays) of sick leave per academic year, with no year-to-year accrual. Under exceptional circumstances, additional sick days may be granted following a written request from the student and approval by the student's thesis advisor (if determined) and graduate program director. Sick leave may be used for medical needs related to pregnancy and childbirth. Absences needed to address chronic health conditions and/or disabilities as part of an Office of Disability, Access, and Inclusion (ODAI) formal accommodation plan may be treated separately from sick leave. Graduate students supported via extramurally funded projects or training grants must comply with sponsor requirements regarding effort.

For the full list please see the Graduate School Policy for PhD Student Vacation and Leave that can be found on the Graduate School Resources page here: **Graduate School - Resources & Forms - CU Anschutz.**

Students are required to keep a record of their leave through their home division or department and the Graduate School.

- Procedure for leave reporting using the Graduate School time and leave reporting by logging at **https://gs.cuanschutz.edu/predocleave** and submit leave requests which will be routed to your mentor for approval.
- Use of AI (**See Appendix 6**)
- Communication
    - All PhD students are required to read emails from the Cancer Biology Leadership and respond by the stated deadlines.
- Milestone updates and changes
- **ORE Honor Code Policy and Committee Procedures**
    - This Office of Research Education (ORE) Honor Code policy provides specific guidelines regarding ORE's expectations regarding Academic Honesty, the ORE Honor Code, and processes to follow when concerns arise.

Graduate School Standards

- You can find the Graduate School Policies and Procedures listed as "Graduate School Policies and Procedures" on the Graduate School Resource page here:
  Graduate School - Resources & Forms - CU Anschutz
    - **Advocacy, Grievance, and Empowerment, Students** : Summary, procedures, and forms for reporting grievances, violence, discrimination, harassment, misconduct, and violations of academic integrity or the Honor Code.
    - **Graduate School Policies and Procedures :** Policies and Procedures outlining minimum standards, requirements, and procedures for all Graduate Programs under the auspices of the Graduate School at the CU Anschutz.
        - **Credits:** The Graduate School requires at least 30 semester hours in didactic coursework (core courses, lab rotations/research - CANB 7650 and program electives) and 30 semester hours of thesis research for the Ph.D. (CANB 8990). All work undertaken as a graduate student must be in compliance with the academic Code of Honor.
        - **Maintenance of a 3.0 GPA:** All students must maintain an average of "B" or better in their coursework. Students are expected to earn a "B" or better in all required courses. Only in exceptional circumstances a "B minus" in a required course may be acceptable, as determined by petition to the Steering Committee.
        - **Preliminary Exam:** In order to continue in the program, a student must pass the Preliminary Exam prior to starting their second year.
        - **Academic Honor Code:** Education at CU Denver | Anschutz is conducted under the honor system. All students who have entered graduate and health professional programs should have developed the qualities of honesty and integrity, and each student should apply these principles to his or her academic and subsequent professional career. All students are also expected to have achieved a level of maturity which is reflected by appropriate conduct at all times. Expectations, definitions, and procedures regarding graduate student conduct are outlined in the Academic Honor Code and the Student Code of Conduct (below).

- **Code of Conduct:** The University strives to make the campus community a place of study, work and residence where people are treated, and treat one another, with respect and courtesy. The university views the student conduct process as a learning experience which can result in growth and personal understanding of one's responsibilities and privileges within both the university community and the greater community. Students who violate these standards may be subject to the actions described below. These procedures are designed to provide learning opportunities dedicated to fairness to all who are involved in the conduct process. As members of the University of Colorado Denver | Anschutz community, students are expected to uphold university standards, which include abiding by state, civil, and criminal laws and all university laws, policies and standards of conduct. These standards assist in promoting a safe and welcoming community; therefore, all students must uphold and abide by them.

- **Student Email Policy** : Guidelines regarding email as an official means of communication (assignment of student email addresses, use of, and expectations of email communication between faculty and student and staff and student).
- **Remedial and Disciplinary Actions:** Students whose cumulative GPA falls below 3.0 will be placed on Academic Probation by the Graduate School. They have two semesters in which to raise their GPA to 3.0 or above for removal from Academic Probation. The University of Colorado System Rules require that after a student is put on academic probation, he/she must maintain a 3.0 in all subsequent semesters. Failing to meet either condition will lead to immediate dismissal from the Graduate School. A "B minus" or below in any required course is considered unsatisfactory academic progress, and more than one "B minus" or below is grounds for dismissal from the Program. A graduate student who receives an unsatisfactory grade in a course (a B minus or below) may be required to repeat that course upon the recommendation of the Steering Committee. All grades received will appear on the student's transcript.

  The steering committee and/or GAC will meet to determine the student's progress. If the student is performing satisfactorily, they will be removed from probation. If the committee determines that the student has not made satisfactory progress, the chair of the thesis committee, the thesis advisor and the student will meet with the Cancer Biology Steering Committee and/or GAC, and the following determinations will be made:

  • the student is not in good academic standing and will be placed on probation again for no more than 30 days.
  • the student is not in good academic standing and will be released from the program.
  • the student is in good academic standing.

  All meetings will be thoroughly documented, and the documentation given to the Program Administrator for placement into the student's file.

- **Change in Thesis Lab:** If a student leaves a thesis lab (but is still considered by the Cancer Biology Steering Committee to be in good academic standing) the student has the current semester (but no more than 90 days) to relocate to another thesis lab and determine a new thesis advisor. In the event that a new thesis laboratory cannot be identified, the student will be dismissed from the Program.

- **Time Limit of Ph.D. Studies:** Students have **eight years** from the time they enter Graduate School to complete all requirements for the degree. Continuation after six years requires the approval of the student's thesis committee and the Steering Committee.

Office of Research Education

- **Office of Research Education**
- Conflict of Interest (reference to Comps and Thesis committees)
  - Honor Code and Committee Procedures
- **Anschutz Email address communication**
- Student Badge Requirement
- **Financial Aid for Graduate Students**
- Residency
- Tuition, fees and stipend
  - All incoming Graduate Students are offered a financial aid package from the Graduate School that includes an annual stipend of **$41,912** (approved for **2025-2026**), tuition costs, and payment of individual student health insurance and activity fees. The Stipend is evaluated on an annual basis for the cost of living. Please note that this support covers the period July 1, through June 30 for continuing PhD students, and August 15, through June 30 for first year PhD students. Payment of annual stipend, along with tuition costs, fees and individual health insurance is dependent upon satisfactory academic progress as defined in the Graduate School and Program policies.

Program Events and Activities

Attendance is required to all the events listed below.

Program Seminar

Attendance at Cancer Biology Research in Progress series is mandatory. Thursdays at 10:30 am This time will be used by current CANB Program students, prospective CANB faculty candidates, and Cancer Center T32 postdoctoral fellows. You are expected to attend and sign in before the start of each seminar. All students are expected to attend in-person. Please contact Program Leadership and Program Administrator if you need to miss a seminar or attend virtually.

Update Talks: Students will give an annual report on the progress of their thesis research to the Cancer Biology Faculty and Students in the form of a 30-minute seminar once every academic year beginning in their 2nd year. The update talk should include one slide on rigor and reproducibility of the research presented. For example, briefly describe how cell lines and key reagents were authenticated, and what statistical methods were used. The update talk should be coordinated with the thesis committee meeting. It is the responsibility of the Committee Chair to post a brief critique of the yearly seminar on Predoc Progress Assessment web site - **http://predocprogress.ucdenver.edu/** . Students actively writing their thesis may be exempt at the discretion of the Program Director.

Annual Retreat

The annual program retreat is held each Fall term and includes participation from all students in either a one- or two-day format. The event is organized by a Retreat Committee composed of fourth-year students in

collaboration with faculty and program leadership. Its primary purpose is to engage and educate PhD students on Cancer Biology–related topics. The committee invites a keynote speaker from outside the institution along with other experts in the field.

The retreat serves as a unique platform for students, postdocs, research staff, and faculty to exchange ideas, receive valuable feedback, and build lasting connections. It is designed to foster meaningful discussions about cancer through the perspectives of survivors, experts, students, and faculty.

Symposium

The Cancer Center Seminar is held on Tuesdays at 11:00 a.m., featuring guest speakers from both programs. On these days, a CANB Program Meet and Greet will also be hosted. All students are expected to attend both the seminar and meet and greet with visiting speakers. This is an excellent opportunity to network, and we strongly encourage students to take full advantage of it.

Student activities

Student lunches are held each Fall, Spring, and Summer term to discuss program updates, student concerns, and new initiatives. These meetings include all students, the Program Director, Associate Director, and Program Administrator. Attendance is required for all PhD students.

Training grants

The National Cancer Institute-funded Training Program in Cancer Biology (TPCB) trains Pre-doctoral and Post-doctoral Fellows in independent, mentored research focusing on all aspects of Cancer Biology. Research is focused on understanding mechanisms of cancer initiation and progression, with a goal of identifying new targets for therapy. Mentors study a large breadth of tumors including cancers of the blood, lung, breast, prostate, salivary, ovarian, bladder, pediatric, colon, etc.

Training Program In Cancer Biology T-32 applications open in the Spring application deadline and requirements may vary each year. Please visit School of Medicine Cancer Center site below and contact Dr. Craig Jordan or Dr. Scott Cramer with questions:

https://medschool.cuanschutz.edu/colorado-cancer-center/education/training-grants

Resources and Support

Students can access a variety of campus services through the links provided below. The Office of Student Affairs is committed to supporting CU Anschutz students by offering guidance and assistance in navigating campus resources. For detailed information about available services or to schedule an appointment, please visit the Office of Student Affairs webpages. For additional questions or support, you may contact the office via email at StudentAffairs@cuanschutz.edu.

- **Office of Student Affairs**
  - **Campus Life**
  - **Student Support**
  - **Health & Wellness**
  - **Student Resources**
  - **Student Services**
- **Students Resource Directory**

  - Includes all campus resources
- **Academic Calendar**
- **Residency**
- **Badging Office**
- **Student Parking & Transportation**
  - Eco Pass
  - Campus Circulator (Transportation service)
  - Medical Campus Rail Shuttle
- **Office of Information Technology**
- **Student Health Insurance**
- **Office of Research Education – Concern Reporting Form (Maxient)**
- **CU Anschutz Student Outreach and Support Referral**
- **CU Anschutz Student Request for Medical Leave of Absence**
- **Graduation Deadlines Thesis, Anschutz**
- **Thesis & Dissertation/ProQuest Format & Guidelines**

Appendices

Appendix 1: Medical Scientist Training Program & Biomedical Sciences PhD Program Handbook

Appendix 2: Cancer Biology Preliminary Exam information and rubric

Appendix 3: Electives

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Appendix 5: Cancer Biology Program Comprehensive/Thesis Committee Form

Appendix 6: Use of AI in ORE courses

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Appendix 11: ORE policy on External Employment for Graduate Students

Appendix 12: CANB Mentor and Mentee Mutual Expectations and AAMC Mentee-Mentor compact

Appendix 1

- **Medical Scientist Training Program**
  - HANDBOOK
- **Biomedical Sciences PhD Program**
  - HANDBOOK

Appendix 2

Cancer Biology Preliminary Exam information and rubric

The goal of the CANB Preliminary Exams is to assess students' mastery of cancer biology, in particular the foundational knowledge gained in first year coursework, and to assess students' ability to develop, support, and test a research hypothesis.

To accomplish this, the exam consists of a written proposal and a comprehensive oral exam. An exam committee of 3-5 Cancer Biology faculty members will evaluate each student. The committee will strive to achieve uniformity and fairness for both the written and oral examination. A grade of **Pass, Fail, or Pass with Conditions** will be given, based approximately equally on the written and oral components (see below).
A student passing with conditions may be asked to revise the written proposal, retake the oral exam, or both, as deemed appropriate by the exam committee. Other conditions are developed on a per-case basis in collaboration with the student's research mentor. In case of a grade of fail, further discussion of appropriate action will be referred to the steering committee.

For the written component the students will be given a selection of seminal papers representative of each block of the Molecular Mechanisms of Cancer Course (CANB 7600) and will choose one on which to write a three-page proposal that will include the following:
1) An abbreviated Specific Aims page, which includes the student's own original hypothesis stemming from the findings of the paper.
2) Background, Significance and Rationale, which includes a brief background on the scientific topic, critical summary of the major findings in the paper and their significance to the field of cancer biology.
3) Experimental Approach, which includes a series of experiments to test the hypothesis (see below for more detailed instructions for the written document) outline of.

Students can discuss their ideas with their peers, but no one is allowed to provide feedback on their written document until after it is submitted to the exam committee.

The written document and oral exam will be evaluated using the rubric below. The written document will not be evaluated on "grantsmanship". The focus will be on evaluating the student's ability for synthesis

and critical assessment of research findings, and the development and testing of a scientific hypothesis. The proposal must be the student's own original work and is submitted 10 days before the oral exam.

The purpose of the oral exam is two-fold. One is to test the student's ability to explain and defend the hypothesis and experiments proposed in the written document. Two, the written document will serve as a departure point to test the student's knowledge of cancer biology and other relevant topics covered in graduate course work up to that point, including the Core Course and Cancer Biology 7600. The student will be expected to answer general knowledge questions on topics related to the proposal or based on graduate coursework. The oral exam will last approximately 60 minutes, consisting of Q&A with the committee. See below for "sample" oral exam. Students will be tested over 1-3 days. Important note: students are expected *not* to discuss the oral exam content with each other while other students are still taking the exam.

Note
Topic paper choice and full exam submission will mirror an LOI and full grant submission, i.e. failure to meet either deadline will be treated as a late grant submission and will not be accepted. This will constitute a 'fail' on the first exam, with option to re-take the exam.

PRELIMINARY EXAM RUBRIC

The goal of this rubric is to help standardize the preliminary exam process. Its purpose it to improve transparency, calibrate expectations, and ensure CANB students are treated equitably. The exam process is inherently subjective and difficult to standardize. This rubric provides a framework for evaluating the student in the most objective manner possible given the complexities of the exam and is meant to have some flexibility.

This rubric contains examples of exam performance and should not be viewed as a strict checklist.

	KNOWLEDGE AND SCHOLARSHIP Identifies background and existing information.	**score:**
4	• Strong evidence of synthesis of concepts covered in coursework. • Terms, concepts, principles and methods are correct and described in depth. • Clearly identifies research problem in the field, based on prior knowledge. • Critiques prior work on the problem. • Demonstrates command of literature relevant to proposal. • Information presented is appropriately cited.	**comments:**
3	• Evidence of synthesis of concepts covered in coursework. • Terms, concepts, principles and methods are mostly correct and described with sufficient depth. • Identifies research problem in the field, based on prior knowledge. • Some critique of prior work on the problem. • Demonstrates familiarity with the literature relevant to proposal. • Most information presented is appropriately cited.	
2	• Some evidence of synthesis of concepts covered in coursework. • Terms, concepts, principles and methods are mostly correct but lacking important details. • Description of prior knowledge is adequate. • Describes, but does not critique prior work on the problem. • Demonstrates familiarity with the literature relevant to the proposal, but some relevant literature is neglected. • Information presented is cited, but could be improved.	
1	• Little to no evidence of synthesis of concepts covered in coursework. • Descriptions of terms, concepts, principles and methods are insufficient and/or incorrect. • Insufficient description of prior knowledge. • Insufficient description of prior work on the problem. • Insufficient incorporation of literature relevant to the proposal. • Information presented is rarely cited.	
	SCIENTIFIC REASONING AND EXPERIMENTAL DESIGN Describes hypothesis and experiments designed to test it.	**score:**
4	• Hypothesis is clearly stated, along with compelling rationale • Compelling rationale for experimental approach is provided. • Experiments are clearly described and appropriate. • Clearly describes controls and how they impact interpretation of the results. • Alternative experimental approaches are clearly described. • Clearly describes how results impact the hypothesis. • Identifies weaknesses in interpretation. • Alternative results are described, and impact on the hypothesis is considered.	**comments:**

3	• Hypothesis is stated and rationale is provided. • Rationale for experimental approach is provided. • Description of experiments is mostly clear and appropriate. • Controls and their interpretation are described. • Alternative experimental approaches are described. • Describes how results impact the hypothesis. • Alternative results are described and connected to the hypothesis.	
2	• Hypothesis is stated, but rationale is weak and could be improved. • Rationale for experimental approach is provided, but is unclear. • Description of experiments lacks some important details. • Controls are described, but description of interpretation is weak. • Alternative experimental approaches are described, but not developed. • Description of how the results impact the hypothesis lacks depth. • Alternative results are described, but not clearly connected to the hypothesis.	
1	• Hypothesis is unclear and rationale is weak. • Insufficient rationale for experimental approach. • Description of experiments is unclear or inappropriate. • Controls are poorly described. • Alternative experimental approaches are insufficiently described. • Insufficient description of how the results impact the hypothesis. • Alternative results are insufficiently described.	
	WRITTEN COMMUNICATION Communicates knowledge and reasoning through writing and graphics.	**score:**
4	• Writing is exceptionally clear and effective. • Graphics are well-organized. • Terms, concepts, principles and methods are used correctly.	**comments:**
3	• Writing is mostly clear and effective. • Most aspects of graphics are well-organized. • Most terms, concepts, principles and methods are used correctly.	
2	• Some aspects of writing are clear and effective. • Some aspects graphics are well-organized. • Some terms, concepts, principles and methods are used correctly.	
1	• Writing is unclear and ineffective. • Graphics are disorganized. • Terms, concepts, principles and methods are lacking and/or incorrect.	
	ORAL COMMUNICATION Communicates scientific knowledge and reasoning through speech and visual displays.	**score:**
4	• Oral communication is exceptionally clear and effective. • Graphics are well-organized. • Response to questions consistently incorporates appropriate evidence. • Response to questions is reflective.	**comments:**

3	• Most of oral communication is clear and effective. • Most graphics are well-organized. • Response to questions often incorporates appropriate evidence. • Response to questions with occasional prompting or “leading” required.	
2	• Some aspects of the oral communication are clear and effective. • Some aspects of the graphics are well-organized. • Response to questions incorrectly, even after prompting or “leading”.	
1	• Oral communication is unclear and ineffective. • Graphics are disorganized. • Fails to respond to questions.	

Appendix 3

- **Electives**

  Electives are selected based on the student's interests and upon consultation with their rotation mentor and/or CANB Advisor. Other electives may be approved with permission of the Program Director and Associate Director.

  Approved electives (course availability may be subject to change, use the list below as an example):

Histophysiology	CANB 7620	3 credits	Usually offered in Spring
Stem Cells and Development	CSDV 7605	4 credits	Usually offered in Spring
Survey of Human Genetics	HMGP 7600	3 credits	Usually offered in Spring
Tissue Biology and Disease Mechanisms	IDPT 7646	3 credits	
Overview of Immunology	IMMU 7530	2 credits	Usually offered in Fall
Molecular Virology and Pathogenesis	MICB 7701	3 credits	Usually offered in Spring
Receptors and Cell Signaling	PHCL 7606	3 credits	Usually offered in Spring
Pharmacology of Anti-cancer Agents	PHSC 7561	2 credits	
Introduction to Microscopy	CSDV 7680	1 credit	Usually offered in Fall
Special Topics in Cancer Biology	CANB 7602	1 credit	Usually offered in Spring
Special Topics in Immunology	IMMU 7602	1 credit	Usually offered in Fall
Stem Cell Biology to Regenerative Medicine	BMSC 7810	2 credits	Usually offered in Fall

* At least 3 credits of electives are required for this program. More can be taken if desired. **The elective requirement should be completed by the end of your 2nd year.** Note: the purpose of the elective is to expand your knowledge base beyond cancer biology. Therefore, no more than one elective credit can be from a special topics in cancer biology course. Please contact the Program Director if you have any questions regarding this requirement. MSTP students have typically met the elective requirement upon entering the program, which should be verified with the Program Director.

Appendix 4

➢ Comprehensive Exam information

Administrative Requirements:

There are two required forms which can be found on the Graduate School website. These forms must be turned into your Program Administrator at least four weeks before your exam and must be turned into the Graduate School (by your Program Administrator) a minimum of two weeks in advance of your exam. If you do not follow these guidelines, your exam may be delayed. https://graduateschool.cuanschutz.edu/forms-resources/resources

(Students: Deadlines & Forms)
All forms must be submitted via DocuSign. Make sure to notify your Program Administrator with the date and time approved by your committee before completing any forms.

- ☐ Application for Candidacy
- ☐ Request to schedule exam

Preparation of the Written Portion of the Comprehensive Exam:

1) Identification of Research Problem: During the 2nd year, the graduate student will, with extensive guidance from the thesis mentor, identify a research problem. This research problem can be within the research area of the intended thesis research or, in fact, can represent the precise research problem that the student and mentor intend to pursue as a thesis project.

2) Establishment of an Exam Committee: The student with guidance from the thesis mentor will identify, contact and retain comprehensive exam committee members with expertise relevant to the research problem. This step should occur mid- to late summer of the 2nd year in order to choose committee members that best match the student's research interests. The committee will be comprised of 4 program members and 1 faculty member outside the Cancer Biology program. All members must have a graduate school appointment, although it is possible to get a temporary "special" appointment for a faculty member for the purpose of sitting on a graduate committee. To assure that all the conditions are met, the composition of the committee must be approved by the Program Director and Associate Program Director (please copy the Program Administrator who can check the status of graduate school appointments).

   a. Pre-comps committee meeting: There is no requirement for a pre-comps committee meeting. If the student elects to have a meeting it should be used as an opportunity for the student to get to know their committee members and to give them a basic overview of the project (a 30-45 min meeting is sufficient). It should not be used for the purpose of critiquing the student's comprehensive exam proposal.

3) Setting a Date: The student and exam committee faculty should schedule a date for the Comprehensive Exam as early as possible (up to several months in advance). This will prevent major delays in the exam date due to schedule conflicts and provide a clear timeline for the preparation of the proposal. Remember - both forms must be turned into your Program Administrator four weeks before your exam, and submitted to the Graduate School for final approval a minimum of two weeks in advance of your exam or you may have to reschedule.

4) Approval of Hypothesis and Specific Aims: The goal of this step is to help the student develop a significant, interesting and testable hypothesis accompanied by a set of Specific Aims that will directly test the hypothesis, not simply describe or explore a research area. Approximately **ten weeks** before the Comprehensive Exam, the student works with their mentor to prepare a one-page document including a description of the problem, hypothesis and specific aims similar to the "Specific Aims" page of a NIH R01 grant. This is then submitted to the members of the Comprehensive Exam committee (hard copy or by e-mail). Within one week of receipt, the committee members will provide comments, either in writing or preferably in person, to the student to improve the significance of the problem, focus the hypothesis, strengthen the Specific Aims, etc.

5) Preparation of Document: Following approval of the one-page Specific Aims, the student prepares a full proposal (7 pages including Specific Aims) complete with Background/Significance, Preliminary Data and Experimental Plan, Anticipated Problems/Alternative Approaches, and Authentication of Key Biological and/or Chemical Resources sections. Rigor should be included in the proposal itself to address the number of replicates, statistical and power analyses, and gender. The proposal should also include a reference section (see NIH guidelines) that does not count towards the 8-page limit. The student is strongly encouraged to obtain feedback from other post-comp students as the mentor should not be involved in preparation of the document (see below). The final draft must be submitted to the committee members at least **two weeks** before the oral comprehensive exam data (ta (see step two above) as dictated by Graduate School rules.

6) Preparation for Exam: In the preceding eight weeks, the student with assistance from program administration will reserve a room for the oral exam (or Zoom under certain circumstances), submit the required paperwork to your Program Administrator and prepare a 15-to-20-minute oral presentation of the proposal.

Special Notes:

Formatting: You document should be formatted according to the NIH guidelines. It should be single-spaced in Times Roman 12pt or Arial 11pt. Margins should be 0.5 inches all around. Figures and figure legends (10 pt font minimum) must be large enough to be easily read.

Involvement of Mentor and Committee members: The program realizes that the student's successful learning of the process of taking a specific scientific idea and expanding it into a relevant research proposal will depend on significant input from faculty members. However, it is important to understand that the comprehensive exam document is the work of the student. It is not a part of mentor's grant, nor is it an adaptation of a previous grant the student (or mentor) may have submitted. Guidance from the mentor should be limited to discussions about the proposed hypothesis and specific aims, with minimal input on experimental design. Students have more latitude with their committee members, and in fact are encouraged to use them as a resource throughout the process. Committee members for instance can provide expert information regarding the weaknesses and pitfalls of specific experiments.

Prior submission of a fellowship: If a student has previously submitted a pre-doctoral grant such as (but not limited to) an NRSA, the mentor must verify that the comprehensive proposal differs by at least 50% from this previous submission.

Appendix 5

➢ Cancer Biology Program Committee Meeting Form

Please fill out the following form and distribute it to your Committee members and Program Administrator no later than one week prior to each committee meeting. This form will serve as a record of your accomplishments and your progress toward completion of your thesis research.

Upon completing this form, please make sure to update your student profile in GAIA with any changes, additions or accomplishments.

Students are required to meet with their committee on an annual basis and highly encouraged to meet with their committee every six months.

Student Name:

Year started graduate school:

Year started thesis project:

Year of comps: Meeting date:

Committee members (note chair):

Thesis mentor:

Title of project: Hypothesis:

Specific aims:

Summary of progress since last meeting (organize by aims, as appropriate; discuss any changes in direction; include response to any major critiques from last meeting)

Manuscripts: type and status (primary/review; in prep, submitted, under review, in revision, in press) Meetings, abstracts and form of presentation (poster/talk)

Fellowships/ Grants (funding agency, name and dates of grant, title of project, total direct costs)

Other experience, accomplishments (Use additional pages as needed)

Individual Development Plan (IDP: https://myidp.sciencecareers.org should be updated on an annual basis (at least) and included here for every committee meeting).

Appendix 6

➢ Use of AI in ORE courses

USE OF AI FOR EDUCATION/TRAINING IN THE ORE PHD PROGRAMS
UPDATED Oct. 29th, 2024

Guidelines for the Use of AI and Machine Learning Tools
(adapted from CSD and MOLB guidelines).

The core course, preliminary exam, and comprehensive exam feature writing exercises where students are instructed to develop and refine original research ideas and proposals. These exercises are key to students' development as scientists. Writing exercises are designed to sharpen skills in synthesizing foundational knowledge, critical thinking, navigating and understanding literature, creativity, and clearly and succinctly communicating your ideas through writing.

Advances in generative Artificial Intelligence (AI) language models have created tools with the potential to enhance scientific writing, including accelerating the writing process and reducing barriers to non-native English speakers. However, these tools also come with pitfalls, including falsified or inaccurate information, breaches of confidentiality, and plagiarism issues. Importantly, improper use of AI tools can potentially undermine the learning objectives of coursework and create inappropriate advantages for some students over others.

This policy establishes guidelines for acceptable and unacceptable use of AI language model tools in the core course. Our goal is to promote acceptable use of new technology while maintaining our overall goals and standards for training. Follow these guidelines to avoid course failure. Any questions regarding this policy and its implementation should be directed to the Course Director.

ACCEPTABLE USE

1. Language and grammar checks. AI tools can be used to check your drafts for grammatical errors. This provides an opportunity for you to learn rules and best grammatical practices.

2. Identifying articles related to a topic of interest. AI tools can be used to identify literature related to a particular topic. Consider this a starting point to direct you to new literature. Your job is then to read this literature, evaluate it, synthesize the content, and use that synthesis to develop a rationale for your original ideas and experimental plans. Be honest and transparent about the use of AI tools in coursework. Citation of any use should be included in the bibliography of your written assignments and include the name of the specific tool (and version) and how it was used. Ex: ChatGPT, v4 was used to evaluate the grammar in this proposal. Suggestions from this evaluation were included in the final draft.

UNACCEPTABLE USE

1. Drafting outlines or paragraphs for research proposals. Writing assignments in core are an expression of your original thinking and writing ability. You may not use AI tools to identify proposal topics or to generate potential experiments for the proposal. You may not use AI tools to generate new written content in your proposal. Although AI tools can be used to evaluate the grammar of your own original written content and make suggestions to improve grammar and clarity, they cannot be used to generate new sentences for your writing assignments. Verbatim use of sentences generated by AI tools will be considered plagiarism.

2. Drafting peer review summaries. You may not use AI tools to generate summaries or reviews of your classmates' work. Peer review is an excellent opportunity to sharpen your critical thinking and evaluate alternative ideas on a topic, and it provides a unique opportunity for practicing concise written communication. Use this opportunity to consider the proposal from your peer and provide your own perspective. Using AI tools to generate summaries or reviews denies you this opportunity, and denies your peer from gaining your perspective. Furthermore, uploading content from another individual's proposal to an AI tool may violate confidentiality, as the uploaded content may be disseminated or used for other purposes and without your consent. NIH has recognized this threat and recently adopted a policy that prohibits the use of generative AI technologies for the peer review process (https://grants.nih.gov/grants/guide/notice-files/NOT-OD-23-149.html).

Please other resources:

Brandeis University

https://www.brandeis.edu/teaching/resources/syllabus/ai-statements.html

UT Austin

https://ctl.utexas.edu/chatgpt-and-generative-ai-tools-sample-syllabus-policy-statements

University of Chicago

https://teaching.uchicago.edu/sites/default/files/2023-09/CCTL_AI%20Syllabus%20Statements.pdf

Appendix 7

➢ Program Specific Thesis Defense Guidelines

After passing the Comprehensive Exam, the student becomes a candidate for Ph.D. The following years are devoted to research on their thesis project. The student must meet with the thesis committee and receive formal approval to begin writing the thesis. Check with the Graduate School for current deadlines, thesis format requirements, and required paperwork prior to writing the thesis and scheduling the defense.

- **Guidelines**: A successful thesis presents a problem-orientated, original and substantive investigation. The methodology and results contained in the thesis must be conclusive and of high quality. The standards are to be those maintained by quality, peer-reviewed scientific journals. The rules of the University of Colorado Graduate School concerning a Ph.D. thesis are as follows: "All doctoral students are required to submit a thesis (or dissertation) to the Graduate School as partial fulfillment of the requirements of the degree of Doctor of Philosophy. The form and scope of this thesis is determined by the student, the thesis advisor, the advisory committee, and the Program. The thesis should be based upon original investigation and showing mature scholarship and critical judgment as well as familiarity with tools and methods of research. It must be essentially approved by the examining committee before the final examination can be taken."

- **Publication Requirement:** Publications are the culmination of the research done in the lab. It is the obligation of all scientists to share their findings with their peers and the public. **Students are required to have at least one primary, first-author paper submitted and in review at a peer-reviewed journal at the time of their thesis defense. The student's manuscript should be the focus of their thesis work. Under exceptional circumstances, co-first author publications may fulfill this requirement with approval of the steering and thesis committees. The decision to let the student defend is at the discretion of the thesis committee and student's mentor.**

  Please start working towards this goal as soon as you enter your thesis lab. Please note that one first-author manuscript under review is the minimum requirement. It is expected that students map their "units of publication" in order to be as competitive as possible for their future career endeavors. Our graduates have an average of four publications.

- **Preparation of the Thesis**: Written Ph.D. thesis approval from the chair of your thesis committee is required prior to scheduling of the thesis with the Graduate School. The Thesis Approval Form may be obtained from the Program Administrator. Furthermore, the thesis advisor must find the thesis acceptable prior to submission to the rest of the committee. The student's PhD thesis advisor should review, provide feedback and approve the written document prior to submitting to the thesis committee. The thesis will be checked for plagiarism. Any plagiarism will initiate an academic honor code review.

- **Thesis Defense**: The thesis defense is the final examination of the thesis and related topics. It includes an oral presentation of the salient points of the research, its conclusions and its integration with the rest of the field. One slide on rigor of the presented research should also be included. Arrangements, including the submission of all required forms, Request for Examination

and Biosketch, for the thesis defense must be completed and submitted to the CANB Program Administrator four weeks before your scheduled defense date. Your completed and approved paperwork must be submitted to the Graduate School by your Program Administrator at least two weeks before your exam date for final approval. All documents must be processed through DocuSign and your Program Administrator will provide you with guidelines. The student must be registered for five credits of CANB 8990 at the time of the thesis defense. Degrees are conferred in May and December; for information regarding deadline dates please refer to the resource labeled "Graduation Deadlines for the Anschutz Medical Campus" on the Graduate School website: https://graduateschool.cuanschutz.edu/forms-resources/resources.

The oral presentation will take the form of a seminar and is open to the entire community. The thesis defense will occur immediately following the seminar and will take the form of questioning by the thesis committee on details of the written document, as well as their general knowledge of their field of research and cancer biology. The final decision regarding the result of the thesis defense is made by the thesis committee. The student must receive affirmative votes from the majority of the committee to pass. The examination may be attempted only once. Disqualification of the thesis examination results in dismissal from the Graduate Program without a degree.

- **Thesis Revisions**: All corrections to the written thesis must be completed within 60 days from the date of the thesis defense and the signed written document submitted to the Graduate School at that time. Exceptions require written approval by the majority of the thesis committee members and the thesis advisor. The student is responsible for providing a completed electronic copy/pdf of their final thesis to the Thesis Advisor, the Program and the Graduate School.

THESIS COMMITTEE AND COMMITTEE EXPECTATIONS

(Adapted 10/2024 from CU Anschutz Immunology Graduate Handbook)

Thesis

Students must register for **thesis** credits in the semester after completing the Comprehensive Exam successfully. The student must continue to register for CANB 8990 (from 1-5 credits) in Fall and Spring semesters each year. For the Summer term, register for 1 credit hour unless you are defending in the Summer semester and then you should register for 5 credits regardless of the number of qualifying thesis credits you have accumulated. In addition, failure to comply with the registration requirement could result in having to retake the comprehensive exam.

Advisors

Students should select a thesis advisor by the end of the Spring semester of their first year. Thesis advisors are selected by mutual consent of the student and the faculty member. The Program Director must approve a student's placement in a thesis lab.

Committees

After successful completion of the Preliminary examination, the student should choose a thesis advisory committee, in consultation with his/her advisor.

1. The thesis advisory committee is composed minimally of a committee chair and four other faculty members, all holding current appointments as faculty in the Graduate School. Furthermore, the majority of this committee (i.e., at least 3) must be comprised of the Cancer Biology Program faculty. If the committee has 6 members, then 4 must be Cancer Biology Program faculty.

2. All Committee members must have Graduate Faculty status. If a faculty member does not have Graduate Faculty status, please ask him/her to contact the Program Director for approval. It takes several months for the Graduate School to approve a faculty member for Graduate Faculty status. Should a member not be approved at the time of the defense, the defense could be voided.

3. The student's thesis advisor may not be a voting member of the thesis committee.

4. A list of Cancer Biology Graduate Program training faculty and their primary academic appointments is available for reference on the Graduate School website: https://www.cuanschutz.edu/graduate-programs/cancer-biology/faculty

5. The primary duties of the thesis advisory committee will be to guide and advise the student's research progress. As the thesis committee needs to provide unbiased advice to the student, the committee membership should be independent from the mentor. Any individual with a real conflict of interest (e.g., financial interest or a spouse of the mentor or student or close collaborator [shared grants]) cannot be a voting member of the committee. Conflicted individuals may still participate in committee meetings but must leave the room with the mentor or student, as appropriate. In addition, a majority of members should not have direct involvement in the student's project or be a close collaborator of the mentor.

6. The student must provide the Program Administrator with the names of his/her Thesis Committee members.

Thesis Advisory Committee Format

Evaluation of Student Progress

Student's progress in the program will be determined by evaluation of:

1. Research productivity
2. Development of the ability to independently conceptualize, design, carry out, analyze and present his/her experiments
3. Ability to discuss his/her research area and answer questions about the research and its context
4. Knowledge of the relevant literature
5. The quality of Research – in –Progress (RIP) presentation
6. Progress towards creating his/her (first-author) publication(s)
7. Progress towards a complete body of work that will constitute his/her thesis

If the student's progress is considered unsatisfactory, the committee should issue a warning to the student in which the deficiencies are clearly identified, and a time period should be set within which it is expected that the student will correct the deficiencies. The program administrator files a copy of the warning in the student's official program file. At the end of the warning period, the committee and student will meet to assess progress. If, upon re-evaluation, progress remains unsatisfactory, the committee will draft a recommendation to be reviewed by the Program Directors. The Cancer Biology Program Directors will inform the student and committee members of the decision in writing.

Thesis Advisory Committee Meeting Format

The thesis committee meeting is meant to provide the student, advisor, and the Cancer Biology graduate program with an evaluation of student progress and to provide support and recommendations to the student and advisor on the thesis project. This should be carried out in a scientifically critical and rigorous but collaborative manner. Meetings are not intended to be examinations. Ideally, meetings should be a scientific discourse between the student and the thesis advisory committee. The student

During the thesis committee meeting the student is expected to provide experimental findings obtained since the last committee meeting as well as future direction of the project with experiments expected to be accomplished by the next committee meeting. Depending on the student's need and direction the data presented may be preliminary or from other sources (i.e., not from the student, per se). This venue is also meant to provide students with an opportunity to hone their scientific communication skills in describing their experiments and interpreting their findings to other scientists.

1. The first committee meeting typically happens during a comprehensive exam.
2. Following the comprehensive exam for subsequent committee meetings, the student should provide the thesis committee chair and committee members with a student thesis committee report, found on **page 30.** This form must be sent to the committee five days prior to the meeting. The form includes the following:
    a. Overall thesis research goals and hypotheses that incorporate any changes to those goals resulting from previous committee meetings.

b. Previous concerns/recommendations of previous thesis committee meetings.
c. Accomplishments since the last meeting discussing how you have addressed previous recommendations and, if you did not, then why not (i.e., not enough time, took a different direction, etc.). Include any new methods/techniques you may have learned, any significant literature sources or collaborators.
d. How did your results affect your original hypothesis or goals? (confirm, deny, modify).
e. Based on the data/results described in (c), state briefly your next steps in elucidating the hypotheses.

3. Each committee meeting should begin with a short discussion with the student in the absence of the mentor, and with the mentor in the absence of the student. In these discussions, both advisor and student are encouraged to provide a candid assessment of the mentorship, how the dissertation project is progressing, and whether any issues have surfaced that the committee needs to be aware of. Below are questions that should be asked.
    a. What challenges or obstacles are you facing in your current lab environment that might be affecting your work or productivity? How as a committee can we mitigate these obstacles?
    b. Is the student making satisfactory progress toward their career goals and is there anything the mentor/committee can do to help with career goals? The student should complete their IDP and include the report in each committee meeting.
    c. How would you assess the graduate student's progress in relation to the goals and milestones set for their research and development? Are there specific areas where they are excelling or need additional support? Which area(s) are the most critical for the committee to address?

4. The thesis committee meeting should begin with a slide prepared by the student that discusses career goals and a list of activities accomplished in the previous year that relate to these goals. This also serves as an official Individual Development Plan (IDP) discussion for the student and advisor.
    a. The student should then present his/her recent research findings to the committee, discuss how these findings impact the thesis work and the future experiments to be performed before the next committee meeting a. It is important the student understands that they should ultimately control these meetings (increasingly so after each meeting). This is best accomplished by having, and presenting, a clear understanding of where he/she is in their thesis project, where the committee (and specific committee members) can be of particular help (direction, technique, approach, etc.), and what are the next goals.
    b. The student should be aware that any data or experiments that are presented can very easily generate discussion by the committee members, which ultimately can take up considerable time. Thus, the presentation of background information and experiments that are not going to be pursued or are not relevant to the thesis direction should be carefully considered.
    c. The thesis committee chair is responsible for ensuring that the discussions stay pertinent to the thesis topic and that respect is maintained towards both student and faculty.

5. Each committee meeting should end with a discussion amongst committee members (in the absence of the student and advisor) on the student's project and progress. The goal of this discussion is to reach a consensus sentiment among the committee on these topics that should be included in the Thesis Committee Report.

6. The Committee chair should relay the consensus sentiment to the student and thesis advisor immediately following the meeting.

7. Finally, the student (and faculty committee members) should be cognizant of the dual nature of the responsibilities of faculty committee members: to nurture and promote scientific progress and development during regular committee meetings and, ultimately, the same faculty members are required to rigorously examine the student on their thesis topic and general cancer biology concepts during the thesis defense.

Responsibilities of Thesis Committee Chair, Committee Members, Advisor, and Student.

Thesis Advisory Committee Chair responsibilities

Thesis Committee Chairs have responsibilities above and beyond those of committee members. Thus, ***before agreeing to accept the chair, faculty should ensure they have adequate time to devote to the student and their thesis project.*** The chair must be a core-training faculty member from the Cancer Biology Graduate Program with a Regular appointment in the UC Graduate School faculty.

Responsibilities include:

1. Presides over the meeting of the Thesis Committee, student and advisor. This includes ensuring the discussion stays on topic and that there is mutual professional respect between adult students and faculty.
2. Completes the online Thesis Committee Report **(**https://gs.ucdenver.edu/gaia/) after each committee meeting, summarizing the discussion and the recommendations of the committee. This report must indicate if progress is satisfactory or unsatisfactory and should be determined after the meeting and as agreed upon by committee members in the absence of the student and advisor. The online report should then be submitted "in collaboration mode" for input from the other committee members, followed by formal submission when this is achieved.
3. Attends the student's RIP
4. Be accessible to the student to discuss issues related to the thesis project.
5. Meets at least every 6 months individually with the student (in the absence of an advisor) to assess lab environment, mentoring, and progress (excluding data and actual experiments).
6. Serves as a liaison between the student, thesis advisor, and thesis committee should matters of disagreement surface.
7. Serves as a liaison with program leadership should the need arise.
8. Presides over the Thesis Defense.

Thesis Advisory Committee Member responsibilities

A student's thesis committee serves several important functions in the student's thesis work and is deserving of appropriate effort and energy by each member. Thesis committee members must hold Regular or Special Faculty appointments in the Graduate School. By assuming committee membership, you must agree to:

1. Attend an approximate 2-hour thesis committee meeting every six months throughout the student's thesis work.
2. Provide the student with guidance concerning the research and help redirect the research into productive avenues.
3. Evaluate the student's progress and ensure that the project is of interest, novel, focused and feasible. The outcome of this work must lead not only to his/her thesis but also to a peer-reviewed first-author publication. Members of the committee must keep this in mind. Work towards this is expected to commence when the student enters the thesis lab meeting.
4. Attend the student's mandated Research-in-Progress (RIP) presentations and relay evaluation to the Thesis Committee Chair.
5. Promote the student's development into a rigorous independent investigator.
6. Provide the student and the mentor with an opportunity to express privately any concerns about the research environment or the progress of the research (see below).
7. Attend student's thesis defense as a faculty examiner.

Online **Thesis committee report** form to be completed by thesis committee chair: https://gs.ucdenver.edu/gaia/

Appendix 8

➢ Individual Development Plan (IDP)

Reference - Science Careers Website

You have put a lot of time and effort into pursuing your PhD degree. Now it's time to focus on how to leverage your expertise into a satisfying and productive career. The Individual Development Plan (IDP) concept is commonly used in industry to help employees define and pursue their career goals. In 2003, the Federation of American Societies for Experimental Biology (FASEB) proposed an IDP framework for postdoctoral fellows in the sciences. AAAS/*Science* joined forces with FASEB and experts from several universities (see authors below) to expand on that framework. The result is myIDP - a unique, web-based career-planning tool tailored to meet the needs of PhD students and postdocs in the sciences.

myIDP provides:

- Exercises to help you examine your skills, interests, and values
- A list of 20 scientific career paths with a prediction of which ones best fit your skills and interests
- A tool for setting strategic goals for the coming year, with optional reminders to keep you on track
- Articles and resources to guide you through the process

Link to myIDP - https://bit.ly/45C87JR

Appendix 9

➢ Faculty information/resources

- Quick Reference table for membership
- Cancer Biology Faculty | School of Medicine

Appendix 10

➢ Useful information for first-year students

Rotation Student Lab Questionnaire

1. How often and when should I expect to meet with the lab PI? What should I prepare in advance that I should bring to those meetings (notebook, raw data, slideshow presentation, written summary of completed work)?
2. How should I communicate with the PI outside of scheduled meetings?
3. Who is the best person in the lab to consult for day-to-day technical advice?
4. Where can I find descriptions of standard lab protocols? When is it appropriate to search the internet for protocols that I will perform in the lab?
5. What is the expectation for the hours/days I should be working in the lab, in my rotation and if I were to join as a permanent member?
6. What is the preferred notebook format for the lab?
7. How do I order something? When should I re-order a lab supply before it's empty?
8. What do I do with dirty lab dishware?
9. Where are the appropriate waste containers in the lab? **This and number 10 should be done on the mandatory Health and Safety Walkthrough that you should do in each lab at the beginning of walk through and you will sign**.
10. What should I do in the event of a lab safety issue? Where are clean-up supplies? Where is the lab safety reference guide?
11. What areas do I only have access to during business hours (7am-6pm)?
12. Is there a weekly lab meeting or other lab/department events that I should be aware of?
13. How can I contact someone with a lab question after hours?
14. How should I store digital data files from my research in the lab?

CANB Rotation Project Proposal Template

All rotation forms must be submitted 1-2 weeks after starting your rotation.

Student Information

Student ID First Name Last Name

Rotation Information:

Rotation: Year: Program

Rotation Start Date: Rotation End Date:

Rotation Mentor: Rotation Co-mentor, if applicable:

Program Questions

Rotation Project Title:

Background:

Hypothesis to be tested:

Specific Aims (2-3)
Please submit 2-3 Specific Aims, each of which consists of 2-3 sentence statements and/or bullet points, of the major goals of the aim and the methods for achieving the aims. The specific aims should be modest in scope, to increase the likelihood of achieving the aims during the rotation.

Below is an overview of the automated form process. Steps in bold are your responsibility as the student:

1. **You will initiate the process by selecting the mentor with whom you wish to rotate.**
    - This step includes program-specific questions, such as outlining your rotation goals.
    - Be sure to follow your program's timeline when submitting the form.
    - **Rotation Form Link**
2. The form is automatically sent via email to the selected mentor.
    - The mentor will review your proposal and indicate their acceptance with a yes/no response and a signature.
3. The form is then automatically routed to your Program Director for final approval.
    - All parties (you, the mentor, and the director) will be notified once approval is granted.
4. One week before the rotation ends, the mentor will receive an email containing a link to your original proposal along with a performance assessment rubric.
    - The mentor will complete the rubric to evaluate your rotation performance.
5. A copy of the completed Post-Rotation Assessment will be sent to you, your Program Director, GAC Chair, mentor, and program administrator.

Important: Because this system contains sensitive student data, you must be on campus or connected via VPN to access and complete the form.

Rotation Assessment Template

We highly recommend that students meet with each rotation mentor to review their performance during their rotation. This is an excellent opportunity for students to provide feedback on their mentors as well.

Instructions

Good mentoring of students includes constructive feedback on how they can continue to improve as scholars and scientists. We hope you are having these discussions with your rotation students, and that these same constructive comments will turn up in these evaluations. Too often students have been surprised and mystified by not being offered positions in labs at the end of their rotations and it would be extraordinarily helpful to all concerned if all faculty members would provide students with thoughtful input both in person and in these evaluations.

Assessment

Please rate the student's performance on the following:

1. Intellectual engagement in research area*
   ◯ A ◯ B ◯ C ◯ D ◯ F

   Comments*

2. Accounting for coursework, effort on research participation*
   ◯ A ◯ B ◯ C ◯ D ◯ F

   Comments*

3. Areas of Strength*

4. Areas for improvement*

Assessment Attachments (0)
Attach supporting documents.

Grade & Completion Date
As the selected mentor for this rotation, my suggested overall grade is:*
◯ A
◯ A-
◯ B+
◯ B
◯ B-
◯ C
◯ I

Mentor Name/Signature* Rotation Completion Date*

Rotation Talk Evaluation

Rotation talks are scheduled the Thursday after the end of the rotation

(3 talks for the academic year).

The purpose of the rotation talk evaluation is to provide constructive feedback for students to improve their oral communication skills.

Please provide constructive advice on:

1. Content of the talk
   Introduction – does the student state the "big problem" and provide appropriate background?

   Hypothesis- is the hypothesis stated and are experimental approaches clearly explained?

   Data –Does the student explain the data clearly and summarize the findings from each data slide? Do they draw attention to what is important?

   Conclusions – Does the student relate the data back to the "big picture"? Do they do a good job of describing future directions?

2. PowerPoint Presentation
   Slides – are the images easy to see (words, graphs, images, etc.)?

3. Interaction with the audience
   Does the student engage with the audience (eye contact)?

   Does the student do a good job of handling questions from the audience?

4. What did you really like about this presentation?

5. What can be improved?

Appendix 11

➢ ORE policy on External Employment for Graduate Students

Background

Graduate students admitted to ORE Programs receive an annual stipend, health insurance coverage and full tuition. They are considered full time students and, per NIH policy, expected to devote a minimum of 40 hours to their PhD training.

Students may wish to take on additional paid employment for financial reasons or to gain experience in teaching, industry or explore other career opportunities. This may be complementary and beneficial to their training and professional development in University of Colorado graduate programs.

In the past students have taken on additional external employment, in some cases becoming self-funded and essentially full-time employees of another company or institution, while simultaneously attempting to complete their PhD training at the University of Colorado. This has been detrimental to academic progress and the student-mentor relationship.

There are currently no guidelines or policies regarding Graduate students engaging in external employment.

Policy

Graduate students, **in good academic standing**, may, **with appropriate approval**, work a **maximum of 10 hours per week.**

Such employment must **be approved in advance in writing** by the Students Program Director for first year students and by Program Director and Thesis advisor for those students who have entered a laboratory or who transfer or are directly admitted to a laboratory.

The Office of Research Education and the Students advisory/ thesis committee must also be informed of any students approved for external employment.

External employment must not conflict with any required elements of a student's PhD training. Examples include but are not limited to: classes, assessments, seminars, journal clubs, lab meetings, retreats and other required program or ORE activities.

Students **must remain in good academic standing** in order to continue their external employment.

Approvals must be reviewed and reported by the student's Program and Advisory committee every 6 months. Students will attest that they have not exceeded approved hours.

Students receiving extramural support for their PhD from training grants or other sources are subject to the requirements and policies of those funding entities and may not be eligible for external employment.

Failure to disclose external employment, falsely reporting or willfully exceeding approved hours will be grounds for disciplinary action and possible dismissal from the PhD program.

Definitions

External employment- any paid (or compensated in kind) work or work product outside of a student's PhD training program and the Office of Research Education.

Good academic standing-maintaining a minimum of a B grade in all classes, rotations and thesis work. Passing Preliminary and comprehensive exams. Meeting other Program requirements, as described in Program Handbooks. Demonstrating satisfactory and timely progress toward the PhD, as determined by the Students Advisory/Thesis Committee.

Resolution of problems

Students may appeal denial or rescinding of approval for external employment on the basis that policies were not followed or applied fairly. Appeals will be reviewed by the Associate Dean for Research Education, and their decision will be final.

Appendix 12

➢ CANB Mentor and Mentee Mutual Expectations and AAMC Mentee-Mentor compact

Things that lab members can expect from their faculty mentor

Scientific

Provides advice regarding design of hypotheses aims and experimental design (this can be less as time
Provides feedback when reviewing results of experiments and assists with interpretations/future plans
Stays up to date with current literature in the field and is willing to discuss presentations, meetings/seminars.
Has early and ongoing discussion regarding the hypothesis of the project and aims and experiments
Meets weekly with student and provides student the opportunity to have additional meetings and present to the group in lab meetings.

Actively searches for funding opportunities (T32s, F31 and others) and helps you with these grants and writes letters of recommendations and mentor section.
Helps you to choose comprehensive exam and thesis committee members if you join the lab.
Timely advice/evaluations/letters of recommendations
Helps you network with faculty on campus or at other institutions if you need to learn a new technique that the lab doesn't do.
Helps you meet scientists from other institutions at meetings and make connections/ networking

Leadership

Can delegate tasks when appropriate
Provides a neutral forum for discussing both scientific and lab issues
Shows discretion at all times
Shows professionalism at all times
Addresses problems as they arise
Is available for meetings/questions

Things that faculty look for and expect from lab members:

Scientific

1. Do you display a good level of interest in the scientific topic.
2. Are you careful to plan and document experimental design, methods and results in lab notebooks (hard copy or electronic) and keep raw data well organized in folders on the server and/or electronic lab notebook.
3. There are lots of different ways to do things in molecular biology. I do not generally mind if people have learned a different way and want to do it their way, but sometimes it is good to see how we do it in our lab first with the person you are working closely with or another lab member.

4. Try first to design the experiment yourself with the proper controls then talk with me or a senior person in the lab about it.
5. We want to see that you are starting to critically evaluate your experimental results. Do appropriate statistics and attempt to interpret and present at lab meeting for feedback. Don't just say "well it didn't work – I don't know why," but rather think about whether appropriate positive and negative controls indicate that we can interpret the experiment adequately. Think about what might be done differently the next time. Keep in mind that if you change more than one thing, you won't know why the result changed.
6. Are subsequent experiments logical extensions of previous experiments?

Work habits

1. Communicate regarding work hours and vacations.
2. Is work planned efficiently to optimize the amount that can be done carefully?
3. Are experiments well planned and performed in a conscientious manner?
4. What use is made of waiting periods between experiments? Study or read literature.

Keeping up with the literature and other research.

1. Do you routinely search for and read papers from the lab or other labs that work on similar/related topics?
2. Do you read papers provided for journal club or other papers that the mentor or lab members suggest?

Creativity and initiative

1. Try to provide input into the design, execution and analysis of your experiments?
2. Don't be afraid to ask questions in lab meetings and seminars.
3. How often do you suggest new approaches or new lines of experimentation for your current project?
4. How much personal responsibility and initiative do you take for meeting deadlines, designing that interpreting experiments, and writing manuscripts, reviews, and grants (later once you are a permanent member of the lab)?
5. If you see a problem in the lab, what is your response (ignore it, complain, suggest a solution)?

Communication skills

1. How effective are your lab meeting presentations and rotation talks?
2. How do you respond to feedback from the mentor and other members of the lab?

Interactions with others

1. Do you take notes when learning a new technique from someone in the lab?
2. Do you leave general lab areas, hoods and equipment clean when you've finished?
3. Do you return reagents, equipment etc to designated places?
4. Are you collegial with lab mates when you ask for help or receive/give feedback.

AAMC Mentor Mentee Compact Biomedical Research.pdf