



# **CANCER BIOLOGY GRADUATE PROGRAM**

## **Student Handbook 2022 - 2023**

### **UNIVERSITY OF COLORADO ANSCHUTZ MEDICAL CAMPUS**

**CANCER BIOLOGY GRADUATE 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>

**Program Director**

Rebecca Schweppe Ph.D.  
Rebecca.Schweppe@CUAnschutz.edu

**Program Administrator**

Aubrey Thorburn  
Aubrey.Thorburn@CUAnschutz.edu

**Steering Committee**

Rebecca Schweppe, Ph.D. (Endocrinology/Medicine) – Program Director  
Jennifer Richer, Ph.D. (Pathology) Graduate Advisory Committee  
Ben Bitler, Ph.D. (OBGYN) – Curriculum Committee  
Phillip Owens, Ph.D. (Pathology) - Admissions Committee  
John Tentler Ph.D. (Oncology/Medicine) – Seminar Committee  
Mayumi Fujita, M.D., Ph.D. (Dermatology) – Membership Committee  
Mary Reyland, Ph.D. (Craniofacial Biology) - Cancer Biology T32 PI

### Disclaimer for Student Handbook

This handbook, which includes parts of the Graduate School Policies and Procedures and the Cancer Biology Graduate Program Guidelines, does not constitute a contract with the University of Colorado Anschutz Medical Campus Graduate School, either expressed or implied. The Cancer Biology Graduate Program reserves the right at any time to change, delete, or add to any of the provisions at its sole discretion. Furthermore, the provisions of this document are designed by the Program to serve as firm guidelines rather than absolute rules, and exceptions may be made on the basis of extenuating circumstances. Finally, in some cases the program has elected to impose standards that differ from the graduate school. In these instances, program rules supersede graduate school rules. The Graduate School Policies and Procedures, as well as additional resources are available at: <https://graduateschool.cuanschutz.edu/forms-resources/resources>

Month	Day	Deadline	Notes
June 2022	6	First day to submit a <b>new</b> non-degree application or <b>continuing</b> non-degree course permission form.	Taking a class requires active non-degree student status. Continuing non-degree students must submit a signed course permission form to enroll every semester.
	13	First day to apply for Fall graduation in UCDAccess.	If you intend to graduate in Fall, you must complete this online application. If you do not, you will not be eligible to receive your degree until Spring.
July 2022	5	Course enrollment for Fall begins in UCDAccess	
August 2022	15	Last day to submit a <b>new</b> non-degree application or a <b>continuing</b> non-degree course permission form.	See June 6 for more info.
	29	First day of Fall full semester classes.	
September 2022	5	Labor Day Holiday	No classes. Campus closed.
	9	Last day to add/drop courses in UCDAccess. * Courses dropped after this date will appear on your transcript with a grade of "W." * Students will be charged all tuition and fees for any course dropped after this date. * Students will be charged a \$60 late fee to add courses after this date.	After this date: • use the small Add/Drop Form to modify credits or add classes if already enrolled in at least one (1) credit. • students who have not registered in any classes must use the Registrar's Registration Form and get the Assistant Dean's signature. • use the Registrar's Course Withdrawal form to withdraw from (drop) a class.
		Last day to petition for resident (in-state) student/tuition status.  Last day to apply for graduation in UCDAccess.	Funded PhD students who do not establish residency by second year may have to pay the tuition difference.  If you intend to graduate in Fall, you must complete this online application. If you do not, you will not be eligible to receive your degree until Spring.
November 2022	24-25	Thanksgiving Holiday	No classes. Campus closed
December 2022	12-16	Final Examination Week	
	16	End of semester	Fall 2022 degrees will be awarded effective this date.
	21	Final grades due (noon)	

Spring 2023	January 23	Classes begin	
	January 16	Martin Luther King Day	No classes. Campus closed.
	February 20	President's Day	No classes. Campus closed.
	March 20-24	Spring Break	No classes. Campus open.
	May 19	End of semester	
	May 26	Commencement & Convocation	
Summer 2023	June 5	Classes begin	
	July 4	Independence Day Holiday	No classes. Campus closed.
	August 18	End of semester	

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## CONTACTS

### School Of Medicine – Office of Research Education

Angie Ribera, Ph.D., Associate Dean 303-724-2911

Graduate School - Dean's Office, Fitzsimmons Building (formerly named Building 500), 5<sup>th</sup> Floor  
<https://graduateschool.cuanschutz.edu/forms-resources/resources>

David Engelke, Ph.D., Dean 303-724-2911

Inge Wefes, Ph.D., Associate Dean 303-724-7368

Bruce Mandt, Ph.D., Director of the Postdoctoral Office 303-724-2930

Kristine Sikora, Ph.D., Assistant Dean and Director of Recruitment 303-724-4379

### Graduate School - Student Affairs Office

Shawna Cox, Ph.D., Assistant Dean 303-724-2914

Teresa Bauer-Sogi, Acting Director of Academic Services 303-724-2915

<b><u>OTHER IMPORTANT NUMBERS</u></b>			
Admissions and Records	303-724-8056	Ombuds Office	303-724-2950
Audio-Visual Assistance	303-724-8129	Parking Office	303-724-0049
Bookstore	303-724-2665	Student Assistance Office	303-724-7684
Bursar's Office	303-724-8032	Title IX Office	1-844-CU-TITLE (1-844-28-84853)
Campus Health Care Center at CU Anschutz	303-724-6242	<b><u>EMERGENCY NUMBERS</u></b>	
Classroom Scheduling	303-724-8114	Police	303-724-4444
Diversity Office	303-724-8003	Police Escort to Car	303-724-4444
E-mail Coordinator	303-724-2129	Fire	303-724-4444
E-mail Help Desk	303-724-2171	Emergency	911
Emergency Dept.	303-848-9111	Non-emergency	303-724-4444
Env. Health & Safety	303-724-0345		
Financial Aid	303-556-2886		
Health Sciences Library	303-724-2152		
Health Promotions/ <b>Student Insurance</b>	303-724-7674		
ID Cards	303-724-0399		
Information Systems	303-724-4357		

<b>Mental Health Resources</b>	<b>303-724-4953</b>		
<b>After hours</b>	<b>720-848-0000</b>		
<a href="#">Disabilities</a> Resources	303-724-8428		

## GENERAL ACADEMIC INFORMATION

The Graduate Program in Cancer Biology is part of the Graduate School of the University of Colorado, which is an equal opportunity institution. The Graduate School is under the leadership of Dean David Engelke, Ph.D. There are many resources available on the Graduate School website, <https://graduateschool.cuanschutz.edu>, including but not limited to Policies and Procedures, Academic Honor Code, and Code of Conduct, etc. The information through the website applies to students in all programs, and it should be used as the primary source for information regarding rules, regulations, procedures and policies. The purpose of the Cancer Biology (CANB) student handbook is to relay additional information specific to the CANB Program.

### Student Support

At present, students accepted in the Ph.D. program are provided full tuition, health and dental insurance, and a stipend of \$34,000 per year for living expenses (for the academic year 2022-2023). Continued support is contingent upon satisfactory academic and research performance by the student. When a student enters a thesis lab, the thesis mentor assumes complete responsibility for the student's stipend, tuition, fees, and associated research costs.

Graduate students admitted to the Cancer Biology Graduate Program are considered full time students and, per NIH policy, are 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. Please refer to Appendix 7 for the full policy

### In-state Residency Status

New students must immediately obtain documentation to support the petition for State Residency. This is a very important priority for first year students and the process should be started as soon as you arrive on campus. After the first full year, funding will be available (assuming satisfactory academic progress) only if the student qualifies as an in-state resident.\* The documents that must be obtained include local checking account, driver's license or State ID, and voter's registration, as well as proof of Colorado domicile. Further information will be provided during the Graduate School Orientation and by the Registrar's Office throughout the year. Please refer to the registrar's website for detailed information: <http://www.ucdenver.edu/anschutz/studentresources/Registrar/StudentServices/Residency/Pages/Residency.aspx>

\*International students cannot gain residency and will remain at an out-of-state tuition rate; they are NOT personally responsible for the tuition differential.

### Checking Account

It is important to complete your W4 and direct deposit set up as soon as possible. The University issues all paychecks, including student stipends, as direct deposit. Students will receive their pay in the form of a pay card in the mail if they don't complete their direct deposit set up in UCDAccess prior to payroll running in their first month. Program Administrator will provide W4 and direct deposit instructions.

### CU Anschutz Medical Campus Identification Card

Everyone on campus must carry a CU Anschutz Medical Campus picture ID. This ID serves many purposes including enabling students to access the library, obtain parking, gain access to buildings after hours, and attend

special University functions. To gain access to restricted lab areas please speak with the departmental administrator for your mentor's department.

### **Insurance**

Each semester students will be auto-enrolled in the Student Health Insurance plan, unless the student has comparable insurance and submits a waiver to the Student Health Insurance Office. The Office of Student Insurance is the best resource for Insurance questions: <https://www.ucdenver.edu/life/services/student-health/insurance/Pages/default.aspx>.

### **E-mail Access and Address**

Graduate students establish their CU Anschutz email address following the matriculation instructions from the Graduate School. Contact the Office of Information Technology for help with any email access issues: <https://www.ucdenver.edu/offices/office-of-information-technology>.

Your.Name@cuanschutz.edu e-mail address will be the primary form of communication between you and the university (i.e. CANB Program, Graduate School, Program Administrator, Bursar's Office, etc.). Please check it often so as not to miss important information.

## **PROGRAM SPECIFIC INFORMATION**

### **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 our students to compete in a biomedical research environment increasingly focused on translational applications of basic 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 Student Advisor or as a group with the GAC 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 examination, and at other times when the student requires faculty consultation.



## COURSE OF STUDY

### A. Cancer Biology Graduate Training Program Curriculum.

#### YEAR ONE

#### 1<sup>st</sup> Semester – Fall

Course Title	Registration Info	Credits
Foundations in Biomedical Sciences	*BMSC 7806	6
Core Topics in Biomedical Sciences - A <i>student may select topic</i>	**BMSC 7810	2
Core Topics in Biomedical Sciences - B <i>Cancer Biology - required by program</i>	**BMSC 7810	2
Responsible Conduct of Research	BMSC 7811	1
Research in Cancer Biology	CANB 7650 (001)	1
Research in Cancer Biology	CANB 7650 (002)	1
Cancer Biology Journal Club	CANB 7613 (001)	1
Research in Progress Seminar	Attendance Required	0

\*BMSC 7806 Foundation in Biomedical Sciences, 2.5 weeks each block; M – Th, 8a – 10a, 6 credits, 08/30/2022 – 11/03/2022. – 11/05/21

Block I	Basic Biochemistry
Block II	Molecular Biology
Block III	Genetics
Block IV	Cell Biology

\*\*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 A – August 29<sup>th</sup> – November 3<sup>rd</sup>, 2022

Please select one of the following:

- Sec 001 – Discovering Protein Structure and Function
- Sec 002 – Microbiology in Biomedical Research
- Sec 003 – Inflammation
- Sec 004 – Evolutionary Genetics & Genomics

Core Topics B – November 29 – December 16, 2022

Sec 011 – Principles of Cancer Biology (REQUIRED)

#### 2<sup>nd</sup> Semester – Spring

Course Title	Registration Info	Credits
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Molecular Mechanisms of Cancer Biology	CANB 7600	4
*Pathobiology of Cancer	CANB 7610 or 7611	1
Grant Writing in Cancer Biology	CANB 7690	1
Electives (as desired; see Appendix 1)		variable
Research in Cancer Biology	CANB 7650 (001)	1
Research In Progress seminar	Attendance Required	0

CANB students must complete five semesters of CANB 7613 with one semester of CANB 7600/7690 counting towards the overall total of six required semesters.

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

### Summer Semester

Doctoral Thesis*	CANB 8990	1 credit
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**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 section (C) for more information.

## YEAR TWO

### 1<sup>st</sup> Semester – Fall

Course Title	Registration Info	Credits
Electives (as desired)*		Variable
**Biostatistics	BIOS 6606	3
Research in Cancer Biology	CANB 7650 (sec 0V3)	1
***Cancer Biology Journal Club	CANB 7613	1
Research In Progress seminar	Attendance Required	0

\* 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 2<sup>nd</sup> 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. You can find a list of approved electives that count toward this requirement in Appendix 1 of the Handbook.

\*\* Other biostatistics courses may fulfill this requirement upon approval of the Program Director

\*\*\* BSP students joining CANB may count BSP journal club toward one semester of CANB Journal Club requirements. If there is a conflict between Journal Club and an elective or other

required class (CCTSI TL1), it is possible to take your final semester of Journal Club later. Reach out to the Journal Club Director and Program Directors to confirm.

## 2<sup>nd</sup> Semester – Spring

Course Title	Registration Info	Credits
Electives (as desired)		Variable
*Pathobiology of Cancer	CANB 7610 or 7611	1
Research in Cancer Biology	CANB 7650 (sec 0V3)	Up to 4 credits
Cancer Biology Journal Club	CANB 7613	1
Research In Progress seminar	Attendance Required	0

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

## Summer Semester

Doctoral Thesis	CANB 8990	1 credit
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**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 and Program Advisor for permission to start registering for CANB 8990.

Following the completion of the required coursework and comprehensive examination, 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).

**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 spring to review the policy and procedures surrounding the comprehensive exam.

## YEAR THREE

### 1<sup>st</sup> Semester – Fall

Course Title	Registration Info	Credits
Electives (as desired)		Variable
Research in Cancer Biology	CANB 7650 (OV3) <b>or</b> CANB 8990 if post-comps	Variable
Cancer Biology Journal Club	CANB 7613	1
Research In Progress seminar	Attendance Required	0

## 2<sup>nd</sup> Semester - Spring

Course Title	Registration Info	Credits
Electives (as desired)		Variable
Doctoral Thesis	CANB 8990	5 credits
Cancer Biology Journal Club	CANB 7613	1
Research In Progress	Attendance Required	0

## Summer Semester

Doctoral Thesis	CANB 8990	1 credit
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## YEAR FOUR (and beyond)

Course Title	Registration Info	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 4<sup>th</sup> 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 **5<sup>th</sup> year students** will take BMSC 7811 to fulfil this requirement. Registration is not required but you will need to contact the Program Administrator for Pharmacology for more information on sitting in on the course.

## Summer semester

Doctoral Thesis	CANB 8990	1 credit; 5 credits if you are defending in the summer
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## Important Registration Notices:

- It is important to note that ALL students must register for 5 hours for the fall and spring semesters to be considered full time, and 1 credit hour of CANB 8990 during the summer semester. All students are required to register for classes or thesis hours every semester.
- It is the student's responsibility to register for classes in a timely manner – all late fees and finance charges will be the responsibility of the student.

## Additionally:

**Attendance at Cancer Biology Research in Progress series is mandatory.** You are expected to attend and sign in before the start of each seminar. All students are expected to attend in-person. Please contact Dr. Schweppe and Aubrey Thorburn if you need to miss a seminar or attend virtually.

**Cancer Biology/Cancer Center**

**Tuesdays at 12 Noon**

Guest Speakers of both programs will present at this day and time

There will be a CANB Program Meet and Greet hosted on these days. All students are expected to attend the meet and greets with outside speakers. This is an excellent opportunity to network and we strongly advise students take advantage of this opportunity.

**Cancer Biology Program Research in Progress**

**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.

**Cancer Biology Thesis Defense Seminars**

All students are expected to attend thesis defense seminars. These occur at different days and times, so please plan accordingly when announcements are sent.

There are several seminar series that often have cancer-related seminars; seminar titles are typically posted and emailed or can be found in the Cancer Center online newsletter. Seminar series of potential interest include but are not limited to (attendance is not mandatory):

**Cells, Cancer and Development seminar series**

Wednesdays at noon

**Molecular Biology Program seminar series**

Thursdays at noon

**Pathology Grand Rounds/Cancer Biology Training Program**

Fridays at noon

**Hormone Related Malignancies/Endocrinology**

Wednesdays at 11 am

**Head and Neck Cancer Seminar Series**

Thursdays at noon

**B. 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.

**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. Richer (Associate Director), 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 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 total, during the summers of the first and second year of Medical School.

**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. at evening, on weekends, and possibly over vacation days during the term. In order to maximize the success of your rotation, we recommend setting up regular meetings with your faculty rotation mentor, drafting the specific aims and hypothesis with your mentor, and presenting your aims, hypothesis, and data in lab meetings throughout your 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. 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.

**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.

**C. Preliminary Exam.** The University of Colorado Graduate School requires two exams of 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.

For example, the 2021-2022 academic year the exam consisted of a short written proposal followed by an oral exam. An exam committee consisting of a minimum of three CANB faculty members will evaluate each student. To strive to achieve uniformity and fairness for both the written and oral examination, all students will be scheduled for the oral portion of their prelim over a one - three day period.

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).

Students can discuss their ideas with their peers, but the written document should not be reviewed by anyone until it is submitted to the preliminary exam committee.

The student will have two weeks to complete the written portion of the exam and will submit the written document one week before the oral exam component. The written component will be checked for plagiarism. Any plagiarism will initiate an academic honor code review.

For the oral exam students will be expected to expand upon their written document and be able to critically analyze the manuscript and defend their new hypothesis, specific aims, and experiments. The oral exam questions will extend beyond the written document to test for overall comprehension of material learned in the Core Course and the Cancer Biology sequence 7600/7690.

#### **Possible outcomes of the Preliminary Exam**

Pass (no conditions)

\*Conditional Pass (conditions must be detailed)

Fail (the student must leave the graduate program).

\*Conditions should be met within three months of the exam, if not sooner, as indicated by the committee. Conditions that cannot be met in such a time would become an F. If the conditions of a conditional pass are met in the timeline requested by the committee this conditional pass will be converted to a pass. It is important to remember that a conditional pass is not a fail and is meant to ensure the success of our students.

See also the 2020 Preliminary Exam document (appendix 6) for more detailed information and timeline.

**D. 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 and Student Advisor. **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.

**E. Comprehensive Exam.** 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 Examination 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. Forms must be completed and submitted to the CANB Program Administrator four weeks before your scheduled exam date. Failure to meet the required deadline might result in rescheduling of your exam. Forms are available from the Graduate School and must be approved by the Program Director and submitted to the CANB Program Administrator for final approval and submission back to the Graduate School. Please meet with or email your Program Administrator once you've selected an exam date to begin working on your exam paperwork. The date of the Comprehensive examination and the composition of the committee must be registered with the Graduate School. **Note: A student must be registered at the time he/she takes the Comprehensive Examination and must have completed, or be registered for, a minimum of 30 units of course work (not including units of CANB 8990).**

**Exam Format:** The Comprehensive Exam consists of a written and oral component. Students will write a 7 page (excluding references) hypothesis-driven proposal in the format of an NIH pre-doctoral fellowship. CANB 7600 and CANB 7690 are designed to help prepare students with writing and defending this exam proposal. The proposal should be related to the student's thesis research and a model figure describing the Aims is strongly encouraged. The written proposal must be distributed to the Comprehensive Exam Committee at least two weeks prior to the oral examination. Each student will be individually administered an oral exam on their proposal. The Comprehensive Exam Committee will be chosen by the student in conjunction with the Student Advisor and the Program Director. **The committee should consist of four members from within the CANB training faculty and one member from outside the program.** The committee is typically set up the semester before, or at least five months before, the comprehensive exam date. The committee must be approved by the Program Director and Program Administrator. Upon passing the exam the student is advanced to candidacy and is expected to assemble a thesis committee. See Appendix 4: "Format for Preparation of the Written Portion of the Comprehensive Exam Cancer Biology Graduate Program" for specific details and timeline. The written component will be check for plagiarism. Any plagiarism will initiate an academic honor code review.

**Oral Exam:** The examination will consist of a 20 minute presentation by the student followed by questions from the Comprehensive Exam Committee. In the oral examination, the student must adequately demonstrate the scientific knowledge and ability to defend their written proposal and demonstrate an in-depth knowledge of cancer biology. In addition they must satisfy the overall requirements for the examination as set forth by the

Graduate School Policies and Procedures, available here: <https://graduateschool.cuanschutz.edu/forms-resources/resources>. As stated in the Graduate School Policies and Procedures, the comprehensive examination, “will test your mastery of a broad field of knowledge, not merely the formal coursework completed.” You can anticipate both specific questions on the written and oral proposal and general knowledge questions in the broad area of Cancer Biology.

### **Possible Results for Comprehensive Exam**

Pass (no conditions)

Conditional Pass (conditions must be detailed)

Fail (the student must leave the graduate program)

After passing the Comprehensive Exam, the student becomes a candidate for Ph.D. The following years are devoted to research on their thesis project.

**F. 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.

**Thesis Committee:** 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 approval of the Program 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.

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. It is strongly encouraged that the student coordinate this meeting with their update talk (see below). The **committee meeting update form**, Appendix 5, and available from the Program Administrator, must be filled out and sent to the committee members and the Program Administrator at least 5 days prior to the committee meeting. Failure to do so may result in having to reschedule the meeting. This form includes a brief written summary of progress made on the stated aims, and updates on manuscripts, grants and presentations. The form should also contain an updated individual development plan (IDP: <https://myidp.sciencecareers.org/>). The IDP should be updated on an annual basis and included on every committee meeting form in order to discuss with your committee. The committee meeting should begin with a short private meeting between the committee faculty and student, followed by a private meeting between the committee faculty and advisor. It is the responsibility of the Committee Chair to post a brief written summary of each committee meeting on the Predoc Progress Assessment web site



- <http://predocprogress.ucdenver.edu/>. If a summary is not provided by the Committee Chair, please follow up with your Chair and Program Director.

**G. 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.

**H. Thesis Completion:** Upon completion of a body of original research that constitutes a significant contribution of new knowledge to the field of cancer biology, students will write a Ph.D. thesis containing this information and defend this document at an oral examination scheduled by the CU Anschutz Graduate School. 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. A copy of the thesis must be given to the thesis committee at least two weeks before the defense. 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.

**I. Career Development Opportunities:** The Graduate School at the University of Colorado Denver and Anschutz Medical Campuses offers a variety of career development workshops, seminars, and training programs. These opportunities are coordinated by the Career Development Office (CDO) and trainings focus on the non-research-based skills that are essential for any successful scientific career: communication, leadership and management, and professionalism. These workshops and seminars are offered many times throughout the year and range from short one-hour lunch sessions to multi-day sessions. More information about the workshops, additional career development resources, and a schedule of events can be found on the CDO website: <https://www.cuanschutz.edu/offices/career-development>.

## **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:*

<https://graduateschool.cuanschutz.edu/forms-resources>.

**A. 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 (see Appendix A of CU ANSCHUTZ MEDICAL CAMPUS Graduate Student Handbook).

**B. 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.

**C. Preliminary Exam:** In order to continue in the program, a student must pass the Preliminary Exam at the end of the first year.

**D. 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 not 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.

**E. Academic Honor Code:** Education at the 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). You can find the Academic Honor Code on the Graduate School Resource page here:

<https://graduateschool.cuanschutz.edu/forms-resources>.

**F. 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. You can find the Student Code of Conduct on the Graduate School Resource page here:

<https://graduateschool.cuanschutz.edu/forms-resources>.

**G. 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.

**H. 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.

**I. Leave of Absence:** Students who need to leave a graduate program for a period of time (up to one (1) year) should consult their program directors for guidance on a Leave of Absence (LOA). Personal LOAs are reviewed and approved entirely through the program and ORE. Medical LOAs are managed through the CU Anschutz Student Outreach and Support Office in collaboration with the program and the ORE. An approved LOA pauses the student's academic record and automatically extends the time limit for completing a degree by the equivalent amount of time that the student spends on leave. Requests for LOA that exceed one (1) year may

be approved with sufficient justification to the Dean of the Graduate School. Students who do not return from their approved LOA will be considered to have withdrawn from their program and will either be required to formally re-apply for admission, or, at the discretion of the program, may be re-admitted through an expedited process.

## **PROGRAM OBLIGATIONS AND RECORD KEEPING**

**A. 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.

**B. 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.

**C. Student's Files:** 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.

**D. Participation in Recruitment Functions:** During 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.

**E. Vacation and Holidays:** Graduate students shall receive all University holidays and no more than 14 calendar days (counting all days Monday through Sunday) of vacation per annum, with no year-to-year accrual. Students shall continue to receive stipends during vacations and holidays. In the Graduate School at CU-Anschutz Medical Campus, the times between academic terms and the Summers are considered active parts of the training period and are not necessarily free times. Students taking courses are expected to attend all classes and take all exams as scheduled. They should not take vacations when classes or exams are scheduled. For advanced students, vacation time should be arranged with the dissertation advisor.

**F. Sick Leave and Other Leave:** Graduate students may continue to receive stipends for up to 15 calendar days (counting all days Monday through Sunday) of sick leave per annum, with no year-to-year accrual. Under exceptional circumstances, additional sick days may be granted following a written request and approval by the student's program director. Sick leave may be used for the medical conditions related to pregnancy and childbirth. The Leave Policy can be found on the Graduate School Resources page here: <https://graduateschool.cuanschutz.edu/forms-resources>.

## APPENDIX 1

### 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.

Approved electives (course availability may change):

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 Fall
Tissue Biology and Disease Mechanisms	IDPT 7646	3 credits	
Overview of Immunology	IMMU 7630	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	
Reproductive Endocrinology and Metabolism	RPSC 7801	3 credits	
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

\* 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.

## APPENDIX 2

### Current Cancer Biology Graduate Program Students

CANB Students 2022 - 2023		
Student	Matriculation Year	Lab
1. Madison Rose	F2016	Schweppe
2. Anagha Inguva	F2018 (MSTP)	Jordan
3. Meghan Kellett	F2018 (MSTP)	Schweppe
4. Hannah Hicks	F2017	Schweppe
5. Allie McMellen	F2017	Bitler
6. Ashley Ward	F2017	Sartorius
7. Jaidev Bapat	F2018	Bitler
8. Lorraine Davis	F2018	Sherbenou
9. Joe Hsieh	F2019 (MSTP)	Jedlicka
10. Claire Ihle	F2018	Owens
11. Connor Purdy	F2018	Ford
12. Lisa Wood	F2018	Moore
13. Phoebe Cao	F2019	Davila
14. Petra Dahms	F2020 (BSP)	Lyons
15. Alan Elder	F2019	Lyons
16. Kelsey Kines	F2019 (MSTP)	Lyons
17. Ashley (Meng-Han) Wu	F2019	Rincon
18. John Aleman	F2020	Karam
19. Sophia Corbo	F2020	Karam
20. Nkolika Egbukichi	F2020 (MSTP)	Schweppe
21. Parsa Haque	F2020	Theiss
22. Alana Keller	F2020	Sherbenou
23. Li-Wei Kuo	F2020	Richer
24. Abraham Martinez	F2020	Pearson
25. Regan Miller	F2020 (BSP)	Jordan
26. Rachel Steinmetz	F2020	Lyons
27. Ellen Bamberg	F2021	Kabos
28. Morgan Fox	F2021	Cittelly
29. Bridget Hoag	F2021	DeGregori
30. Nicholas Olimpo	F2021	Karam
31. Daniela Ortiz Chavez	F2021	DeGregori
32. Pearl Wilcock	F2021	Davila
33. Clarissa Garcia	F2022	Rotating
34. Mary Grace Carroll	F2022	Rotating
35. Kady Dennis	F2022	Rotating

## APPENDIX 3

### Cancer Biology Graduate Program Faculty and Research Interests

#### Graduate Faculty

Steve Anderson, Ph.D.  
David Bentley, Ph.D.  
Benjamin Bitler, Ph.D.  
Cecilia Caino, Ph.D.  
Diana M. Cittelly, Ph.D.  
James C. Costello Ph.D.  
Scott Cramer, Ph.D.  
Eduardo Davila, Ph.D.  
James DeGregori, Ph.D.  
Joaquin Espinosa Ph.D.  
Lauren Fishbein, M.D., Ph.D.  
Heide Ford, Ph.D.  
Mayumi Fujita M.D., Ph.D.  
Bryan R. Haugen, MD  
Lynn E. Heasley, Ph.D.  
Cheng-Jun Hu, Ph.D.  
Paul Jedlicka, M.D., Ph.D.  
Antonio Jimeno, M.D., Ph.D.  
Craig Jordan, Ph.D.  
Peter Kabos, M.D.  
Sana Karam, M.D., PhD.  
Robert Keith, M.D.  
Katja Kiseljak-Vassiliades, D.O. (Associate)  
James R. Lambert, Ph.D.  
Ryan Lanning, M.D., PhD. (Associate)  
Shi-Long Lu M.D., Ph.D.  
Traci Lyons, Ph.D.  
Siddhartha Mitra, Ph.D.  
Jeff Moore, Ph.D.  
Neelanjan Mukherjee, Ph.D.  
Raphael A. Nemenoff, Ph.D.  
David Orlicky, Ph.D.  
Philip Owens, Ph.D.  
Chad Pearson, Ph.D.  
Eric Pietras, Ph.D.  
Rytis Prekeris, Ph.D.  
Mary E. Reyland, Ph.D.  
Jennifer Richer, Ph.D.  
Mercedes Rincon, Ph.D.  
Carol Sartorius, Ph.D.  
Rebecca Schweppe, Ph.D.  
Daniel Sherbenou, M.D., Ph.D.  
Yiqun Shellman, Ph.D.  
Matthew Sikora, Ph.D.  
Jill Slansky, Ph.D.  
Meredith Tennis, Ph.D.  
John Tentler, Ph.D. (Associate)  
Tamara Terzian, PhD (Associate)  
Arianne Theiss, Ph.D.  
Rajeev Vibhakar M.D., Ph.D.  
Margaret Wierman, Ph.D. (Associate)  
Yuwen Zhu, Ph.D.

#### Primary Appointment

Pathology  
Biochemistry & Molecular Genetics  
Obstetrics and Gynecology  
Pharmacology  
Pathology  
Pharmacology  
Pharmacology  
Medical Oncology  
Biochemistry & Molecular Genetics  
Pharmacology  
Medicine - Endocrinology  
Pharmacology  
Dermatology  
Medicine - Endocrinology  
Craniofacial Biology  
Craniofacial Biology  
Pathology  
Medical Oncology  
Hematology  
Medical Oncology  
Radiation Oncology  
Pulmonary Sciences  
Medicine - Endocrinology  
Pathology  
Radiation Oncology  
Otolaryngology  
Medical Oncology  
Pediatrics  
Cell & Developmental Biology  
Biochemistry & Molecular Genetics  
Medicine - Renal  
Pathology  
Pathology  
Cell & Developmental Biology  
Hematology  
Cell & Developmental Biology  
Craniofacial Biology  
Pathology  
Immunology/Microbiology  
Pathology  
Medicine - Endocrinology  
Hematology  
Dermatology  
Pathology  
Immunology  
Medicine - Pulmonary  
Medical Oncology  
Dermatology  
Medicine - Gastroenterology  
Pediatric Hem/Oncology  
Neuroscience  
Medical Oncology



## APPENDIX 4

### 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 this guideline, your exam may be delayed.

<https://graduateschool.cuanschutz.edu/forms-resources>

(Students: Deadlines & 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).

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 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 you Program Administrator four weeks before your exam, and submitted the Graduate School for final approval a minimum of two weeks in advance of your exam or you may have to reschedule.

3) 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.



4) Preparation of Document: Following approval of the 1 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). Final draft must be submitted to the committee members at least two weeks before the oral comprehensive exam data (see step two above) as dictated by Graduate School rules.

5) 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: Your document should be formatted according to the NIH guidelines. It should be single-spaced in Times Roman 12pt or Arial 11pt font. 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 a more latitude with their committee members, and in fact are encouraged 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 NRSA: 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.*

**Student Name:**

**Year started graduate school:**

**Year started thesis project:**

**Year of comps:**

**Meeting date:**

**Committee members (note chair):**

**Thesis mentor:**

**Title of project:**

**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

### 2021 Cancer Biology Preliminary Exam

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 one week 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**

	<b>KNOWLEDGE AND SCHOLARSHIP</b> Identifies background and existing information.	score:
4	<ul style="list-style-type: none"> <li>• Strong evidence of synthesis of concepts covered in coursework.</li> <li>• Terms, concepts, principles and methods are correct and described in depth.</li> <li>• Clearly identifies research problem in the field, based on prior knowledge.</li> <li>• Critiques prior work on the problem.</li> <li>• Demonstrates command of literature relevant to proposal.</li> <li>• Information presented is appropriately cited.</li> </ul>	comments:
3	<ul style="list-style-type: none"> <li>• Evidence of synthesis of concepts covered in coursework.</li> <li>• Terms, concepts, principles and methods are mostly correct and described with sufficient depth.</li> <li>• Identifies research problem in the field, based on prior knowledge.</li> <li>• Some critique of prior work on the problem.</li> <li>• Demonstrates familiarity with the literature relevant to proposal.</li> <li>• Most information presented is appropriately cited.</li> </ul>	
2	<ul style="list-style-type: none"> <li>• Some evidence of synthesis of concepts covered in coursework.</li> <li>• Terms, concepts, principles and methods are mostly correct but lacking important details.</li> <li>• Description of prior knowledge is adequate.</li> <li>• Describes, but does not critique prior work on the problem.</li> <li>• Demonstrates familiarity with the literature relevant to the proposal, but some relevant literature is neglected.</li> <li>• Information presented is cited, but could be improved.</li> </ul>	
1	<ul style="list-style-type: none"> <li>• Little to no evidence of synthesis of concepts covered in coursework.</li> <li>• Descriptions of terms, concepts, principles and methods are insufficient and/or incorrect.</li> <li>• Insufficient description of prior knowledge.</li> <li>• Insufficient description of prior work on the problem.</li> <li>• Insufficient incorporation of literature relevant to the proposal.</li> <li>• Information presented is rarely cited.</li> </ul>	
	<b>SCIENTIFIC REASONING AND EXPERIMENTAL DESIGN</b> Describes hypothesis and experiments designed to test it.	score:
4	<ul style="list-style-type: none"> <li>• Hypothesis is clearly stated, along with compelling rationale</li> <li>• Compelling rationale for experimental approach is provided.</li> <li>• Experiments are clearly described and appropriate.</li> <li>• Clearly describes controls and how they impact interpretation of the results.</li> <li>• Alternative experimental approaches are clearly described.</li> <li>• Clearly describes how results impact the hypothesis.</li> <li>• Identifies weaknesses in interpretation.</li> <li>• Alternative results are described, and impact on the hypothesis is considered.</li> </ul>	comments:

3	<ul style="list-style-type: none"> <li>Hypothesis is stated and rationale is provided.</li> <li>Rationale for experimental approach is provided.</li> <li>Description of experiments is mostly clear and appropriate.</li> <li>Controls and their interpretation are described.</li> <li>Alternative experimental approaches are described.</li> <li>Describes how results impact the hypothesis.</li> <li>Alternative results are described and connected to the hypothesis.</li> </ul>	
2	<ul style="list-style-type: none"> <li>Hypothesis is stated, but rationale is weak and could be improved.</li> <li>Rationale for experimental approach is provided, but is unclear.</li> <li>Description of experiments lacks some important details.</li> <li>Controls are described, but description of interpretation is weak.</li> <li>Alternative experimental approaches are described, but not developed.</li> <li>Description of how the results impact the hypothesis lacks depth.</li> <li>Alternative results are described, but not clearly connected to the hypothesis.</li> </ul>	
1	<ul style="list-style-type: none"> <li>Hypothesis is unclear and rationale is weak.</li> <li>Insufficient rationale for experimental approach.</li> <li>Description of experiments is unclear or inappropriate.</li> <li>Controls are poorly described.</li> <li>Alternative experimental approaches are insufficiently described.</li> <li>Insufficient description of how the results impact the hypothesis.</li> <li>Alternative results are insufficiently described.</li> </ul>	
<b>WRITTEN COMMUNICATION</b> Communicates knowledge and reasoning through writing and graphics.		score:
4	<ul style="list-style-type: none"> <li>Writing is exceptionally clear and effective.</li> <li>Graphics are well-organized.</li> <li>Terms, concepts, principles and methods are used correctly.</li> </ul>	comments:
3	<ul style="list-style-type: none"> <li>Writing is mostly clear and effective.</li> <li>Most aspects of graphics are well-organized.</li> <li>Most terms, concepts, principles and methods are used correctly.</li> </ul>	
2	<ul style="list-style-type: none"> <li>Some aspects of writing are clear and effective.</li> <li>Some aspects graphics are well-organized.</li> <li>Some terms, concepts, principles and methods are used correctly.</li> </ul>	
1	<ul style="list-style-type: none"> <li>Writing is unclear and ineffective.</li> <li>Graphics are disorganized.</li> <li>Terms, concepts, principles and methods are lacking and/or incorrect.</li> </ul>	
<b>ORAL COMMUNICATION</b> Communicates scientific knowledge and reasoning through speech and visual displays.		
4	<ul style="list-style-type: none"> <li>Oral communication is exceptionally clear and effective.</li> <li>Graphics are well-organized.</li> <li>Response to questions consistently incorporates appropriate evidence.</li> <li>Response to questions is reflective.</li> </ul>	comments:

3	<ul style="list-style-type: none"> <li>• Most of oral communication is clear and effective.</li> <li>• Most graphics are well-organized.</li> <li>• Response to questions often incorporates appropriate evidence.</li> <li>• Response to questions with occasional prompting or “leading” required.</li> </ul>	
2	<ul style="list-style-type: none"> <li>• Some aspects of the oral communication are clear and effective.</li> <li>• Some aspects of the graphics are well-organized.</li> <li>• Response to questions incorrectly, even after prompting or “leading”.</li> </ul>	
1	<ul style="list-style-type: none"> <li>• Oral communication is unclear and ineffective.</li> <li>• Graphics are disorganized.</li> <li>• Fails to respond to questions.</li> </ul>	

## Appendix 7

### 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.

#### Policy

Graduate students, as key personnel substantively involved in research related activities, are subject to the University of Colorado [conflict of interest and commitment](#) policy:

*“With prior written approval by the dean or appropriate campus authority, faculty and staff members shall be permitted to receive additional remuneration from sources outside the university so long as the activities generating the income do not exceed one-sixth of their time and effort.”*

In addition, [NIH policies](#) state:

*“NIH recognizes that student or postdoctoral trainees may seek part-time employment coincidental to their training program to further offset their expenses. Fellows and trainees may spend on average, an additional 25% of their time (e.g., 10 hours per week) in part time research, teaching, or clinical employment, so long as those activities do not interfere with, or lengthen, the duration of their NRSA training.”*

In accordance with the above policies, Graduate students, **in good academic standing**, may, **with appropriate approval**, work approximately **10 hours per week** in external employment.

Such employment must **be approved in advance**, by the Office of Research Education (ORE), 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.

External employment must not conflict or interfere with any required elements of a student's PhD training or lengthen that training. Examples include but are not limited to: laboratory research, 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.

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 Student's 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.