



THE UNIVERSITY OF CHICAGO

**COMMITTEE ON CANCER BIOLOGY
(CCB) PHD PROGRAM**

**Student Handbook
2020-2021**

Version 20.2, revised September 22, 2020

Students who matriculated prior to Fall, 2020, may rely on guidelines posted in prior Student Handbook versions

All CCB guidelines herein may be superceded by BSD and/or University policy, particularly for COVID-19 adaptation

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ACADEMIC CALENDAR

2020-2021

Autumn 2020

Date

Event/Deadline

September 21-25

Orientation

September 21

Registration

September 29

Quarter Begins

November 23-27

Thanksgiving Break

December 12

Quarter Ends

WINTER 2021

January 4

Quarter Begins

January 18

Martin Luther King, Jr. Day

March 20

Quarter Ends

SPRING 2021

March 29

Quarter Begins

May 31

Memorial Day

June 12

Quarter Ends

June 12

Convocation

SUMMER 2021

June 21

Quarter Begins

July 5

Independence Day

August 28

Quarter Ends

(Calendar subject to change)

UChicago Calendar: <https://www.uchicago.edu/academics/calendar/>

**BSD DIVISIONAL ADDRESS LIST
OFFICE OF GRADUATE AND POSTDOCTORAL AFFAIRS**

Office of Graduate & Postdoctoral Affairs Website:

<https://biosciences.uchicago.edu/programs>

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Gini Fleming
Scott Oakes
Alex Muir
Shannon Elf

Students:
Emma Wilkinson
Manisha Krishnan
Santiago Acero Bedoya
Briana Banks
Juan Apiz

Executive Advisory Committee

Barbara Kee
Geof Greene
Walter Stadler

Curriculum Committee

Eileen Dolan, Chair
Geof Greene
Mark Lingen

Admissions and Recruitment Committee

Faculty:
Shannon Elf, Chair
Alex Muir

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PROGRAM OF STUDY

The PhD program for students entering in 2020 and onward is summarized on the CCB website, here:

<https://cancerbio.uchicago.edu/about>

In greater detail, the expected program of study will be as follows:

Year 1.

Milestones for the first year, ending with Summer quarter, include becoming an engaged member of the CCB community, pursuing graded coursework, completing laboratory rotations, selection of a thesis advisor, and passing the Preliminary Exam.

In the Fall, all CCB students will register for Cancer Biology I: Cancer Fundamentals (CABI 30800). This graded course introduces students to basic concepts and current research topics. One course credit is earned.

Many students will register for another graded, one credit, formal course in the Fall quarter, depending on their interests and/or gaps in their preparation.

Also during the Fall, students are encouraged to meet with ten CCB faculty, one each week, for advice on graduate study, to discuss research opportunities and/or consider potential rotation projects. Students will register for Readings in Cancer Biology, CABI 39900, during the Fall quarter and receive a half course of credit linked to meeting CCB faculty and discussing their published and ongoing research.

First year students are required to register for “All Stars” which meets every Tuesday in Autumn and Winter Quarters from 1:00 to 2:00 pm. Each meeting, two faculty from one or more Biomedical Cluster programs describe opportunities for graduate research in their labs. All Stars attendance counts as a half course each quarter.

During Winter and/or Spring quarters, students will register for at least two and no more than four five-week sessions of Readings in Cancer Biology (CABI 39900). This course helps students develop their skills in critical analysis and presentation of recent literature. Each five week session counts as a half course.

Students will complete two nine-week or three six-week laboratory rotations during Winter and Spring quarters. The rotations must be in different laboratories and at least one should be with a CCB faculty member. Each rotation must be approved by the Curriculum Committee. The rotations will count as one full course, graded Pass/Fail, as suggested by the rotation supervisors.

All first year graduate students must take the divisionally required course, Scientific Integrity and the Responsible Conduct of Research, in the Spring.

Students are encouraged to propose a thesis advisor and a co-mentor to the Curriculum Committee at the end of Spring quarter so that they can begin full time thesis research in the Summer. However, subject to approval of the Curriculum Committee, they may pursue one or two more 6 week rotations in the Summer before selecting a thesis advisor. All students are

expected to have chosen a thesis advisor and co-mentor before the beginning of Fall quarter of the second year.

First year students are required to take the Preliminary Examination during Summer quarter and must pass to begin their full time thesis research.

Year 2.

Although coursework continues during the second year, the primary focus is making progress on the thesis project. Milestones are passing the qualifying exam, completing the formal curriculum and submitting a fellowship proposal.

During the Summer or Fall quarters, students will form a thesis committee. During Fall or Winter quarter, students will meet with their thesis committee and present their thesis proposal, which will serve as the qualifying exam. A pass is required to become a candidate for the PhD degree.

After taking the Fall quarter course, Hypothesis Design and Grant Writing Skills (**CABI 31600**), students will submit a fellowship application or grant proposal before the end of the second year. Success will allow students to support their own stipend, tuition and/or research costs.

A partial list of fellowships that students may apply for along with recent CCB awardees are shown here:

<https://cancerbio.uchicago.edu/page/student-fellowships-2>.

Second year students are also required to complete an Individual Development Plan (www.myidp.sciencecareers.org) that outlines their timeline for successful completion of their doctorate thesis and summarizes other activities planned to promote their career. This is shared with the thesis advisor, co-mentor and the rest of the thesis committee.

Year 3.

The key objective in Year 3 is to make substantial progress on the thesis project. Most students should hold two thesis committee meetings during their third year. Assuming reasonable progress, students should also plan to prepare and submit a first-author research publication. For students who were unsuccessful applying for a fellowship in Year 2, submitting a revision or new applications is expected.

Third year CCB students attend the AACR annual meeting as part of their training and to gain exposure to broad based, cancer-focused scientific meetings. Students must submit an abstract for poster or oral presentation to receive funding for registration, and accommodations.

Students should update their IDP each year and share this with their thesis committee.

Years 4, 5 and 6.

Senior students continue their thesis research, with a focus on developing publication-quality results and submitting research papers. Each student will continue to hold a thesis committee meeting every 6 to 12 months.

Before the end of the fourth year, students must present a realistic timeline for publication of their thesis research and writing the dissertation to their thesis committee. If approved, this is then sent to the Cluster office.

Students should plan to hold their penultimate meeting during the fifth year, with the expectation of defending their thesis in Spring or Summer quarter. Students who will not be ready in time must inform their thesis committee and request approval to continue their research. The approval to write the dissertation and defend or to remain in the program must be transmitted to the Cluster office.

It is not unusual to extend studies into the sixth year. However, students who will not defend during the fifth year must petition the Curriculum Committee to remain in the program for a sixth year. These requests will be approved for reasons such as unexpected difficulties, unavoidable disruptions and unusual opportunities. Slow progress alone or failure to submit manuscripts are not sufficient. All students must complete their degree before the end of the sixth year to remain in good standing. The Curriculum Committee will review all sixth year students in Winter quarter. In general, they will not approve continuing in the program past the sixth year.

Students should update their IDP and share that with their thesis committee for each meeting.

To graduate, students must produce a scholarly dissertation describing their original research, present their work at a public seminar and then defend it before a faculty examining committee. After a successful defense and acceptance of the dissertation, the committee will recommend the PhD degree.

Senior Ethics Requirements. In accordance with recent changes in NIH policy, which require trainees to receive ethics training at least once every four years, the Biomedical Sciences Cluster has organized a new course, Continuing Ethics Training for Senior Pre-doctoral students, that is mandatory for all pre-doctoral students prior to their thesis defense. This advanced Ethics course complements the divisional first year course (BSDG 55000) and does not cover the same material. Each class consists of a discussion on the topic at hand that is accompanied by assigned reading and appropriate case studies. Absence at any one class is made up by preparation of a written paper.

Other training activities

Students are expected to attend all **UCCCC and CCB seminars** and are encouraged to take advantage of other seminars and events on campus throughout the year.

The **BSD Graduate Student Seminar (GSS)** series is an informal gathering of the Divisional graduate students every Friday at 4 PM in CLSC 101.

The CCB co-sponsors an annual **Biomedical Sciences Cluster Retreat** that is typically held off-campus. The retreat features talks from current students, post-doctoral fellows, new faculty members, other invited speakers, and includes a poster session.

MyChoice. The MyChoice program aims to educate trainees about career options that leverage their strong biomedical research training, including employment paths centered on business, education, innovation, research, or policy located within government, industry, universities and other institutions of learning, or the public sector. CCB students use MyChoice to explore career

opportunities beyond academic science as well as to improve key skills such as communication, team management, and goal setting.

Evaluation

Throughout their term as graduate students, we expect students to seek feedback from and develop multiple mentor-mentee relationships with diverse faculty beyond their thesis advisor and co-mentor. Thereby, students can obtain frequent appraisals of their progress and constructive advice.

Formal evaluation of student progress during the first year is based on student performance in courses, laboratory rotations, and the preliminary examination. Following the qualifying examination, the thesis committee reports to the Curriculum Committee on student progress after each meeting, at six to twelve month intervals. The Curriculum Committee will inform students of any deficiencies in writing and suggest remedies.

CCB Courses

Cancer Biology Fundamentals (CABI 30800). This course introduces students to key aspects of cancer biology, including fundamental molecular mechanisms (includes tumor suppressor and oncogene function, cell cycle checkpoint control, cytokinesis defects and aneuploidy, DNA damage sensing & repair, cell death mechanisms, cellular senescence) underpinning the initiation and progression of disease. These lectures are taught alongside an introduction to clinical and translational perspectives, on the topics of epidemiology, pathology, diagnosis and staging, and the basis for various therapeutic strategies with an emphasis on four different organ sites to illustrate key points. The course concludes with an examination of how to identify important research questions in cancer biology and the importance of innovation in research. Required course for Autumn quarter of 1st year. *Course Director - M. Lingen*

Readings in Cancer Biology (CABI 39900). This course consists of five week sessions of directed reading with individual CCB faculty members. Pairs of students select a faculty member from the schedule. The faculty member selects a recent peer-reviewed paper for each week. The students read the paper along with background literature and prepare two presentations that together cover the components of the Preliminary Exam. At the first meeting, the students provide a scholarly introduction to the paper's topic including key methods. At the second meeting, the students present a critical analysis of the paper's results and conclusions, identifying strengths and weaknesses and opportunities to improve the rigor of the work and/or follow up on the findings. In the Fall quarter, students may register to obtain a half credit for speaking with at least ten CCB faculty. In Winter and Spring, offered in five week blocks, depending on faculty availability. Two or more blocks, with a maximum of four, must be completed during the 1st year for one course credit. *Course Director - S. Kron*

Hypothesis Design and Grant Writing Skills (CABI 31600). This is a course based on developing and testing hypotheses that will provide an overview and real-world experience of the grant-writing process, as well as responding to criticisms and presenting one's grant in a precise but concise manner. As it is a course centered around in-class discussion, it is dependent on the consistent creativity and participation of students in order to provide and receive useful feedback to and from their colleagues. The proposal will formulate hypotheses around the student's own research project. The completed proposal should provide a strong basis for future F31 or other fellowship applications or a pilot grant proposal. Review and input from each student's mentor and laboratory colleagues is encouraged. ***Satisfactory completion for a letter grade depends on submitting a fellowship or research grant proposal.***

Required course for Autumn quarter of 2nd year. Course Directors – A. Basu, E. Izumchenko, K. Bader

Translational Approaches in Cancer Biology (CABI 32000). This is a lab/clinic-based course in which students complete training objectives in multiple modules of translational/applied cancer research (clinical, animal models, targeted therapy, intellectual property, bioinformatics, nanotechnology and population science). The emphasis of the course is hands-on experience and a high degree of independence is expected. Trainees select a topic on which to write up a final discussion paper and each student will deliver a presentation on their topic that incorporates elements of the different translational elements discussed during the quarter.
Required course for Spring quarter of 2nd year. Course Director - K. Macleod

Other Coursework

Cancer Biology students are expected to take formal courses that will address gaps in the student's knowledge or experience, spread over the first three years. In addition to **two required graded elective courses**, students may choose to take additional courses for grades or pass/fail. The Curriculum Committee can provide feedback on best choices for each student. Also, the Curriculum Committee may require students to take specific courses based on unsatisfactory performance in other coursework and/or gaps identified during the Preliminary Examination. Following are examples of courses offered by other graduate programs that CCB students have taken and found valuable.

Courses that CCB students have previously considered valuable:

Cell Biology 1 (MGCB/BCMB/HGEN 31600). Eukaryotic protein traffic and related topics, including molecular motors and cytoskeletal dynamics, organelle architecture and biogenesis, protein translocation and sorting, compartmentalization in the secretory pathway, endocytosis and exocytosis, and mechanisms and regulation of membrane fusion. *Turkewitz, Glick.* Autumn.

Stem Cells and Regeneration (DVBI 36200). The course will focus on the basic biology of stem cells and regeneration, highlighting biomedically relevant findings that have the potential to translate to the clinic. We will cover embryonic and induced pluripotent stem cells, as well as adult stem cells from a variety of systems, both invertebrate and vertebrates. *Ferguson, Prince, Cunningham, De Jong, Wu.* Autumn.

Health Disparities in Breast Cancer (BIOS25327, CCTS40400). Across the globe, breast cancer is the most common women's cancer. In the last two decades, there have been significant advances in breast cancer detection and treatment that have resulted in improved survival rates. Yet, not all populations have benefited equally from these improvements, and there continues to be a disproportionate burden of breast cancer felt by different populations. In the U.S., for example, white women have the highest incidence of breast cancer but African-American women have the highest breast cancer mortality overall. The socioeconomic, environmental, biological, and cultural factors that collectively contribute to these disparities are being identified with a growing emphasis on health disparities research efforts. In this 10-week discussion-based course students will meet twice weekly and cover major aspects of breast cancer disparities. The course is led by a team of faculty with expertise in the socioeconomic, biological, cultural and environmental approaches used to study disparities in breast cancer outcomes. The course objectives are: 1) to introduce students to how different communities and populations are impacted by breast cancer incidence, mortality and survival, 2) to analyze the complex factors that contribute to breast cancer disparities, including socioeconomic, cultural,

lifestyle and biological factors, 3) to discuss the research and data analysis approaches employed in disparities research, 4) to assess strategies to reduce breast cancer disparities, and 5) to construct and discuss a research proposal in disparities research.

Course Directors: Dolan. Winter.

Genomics and Systems Biology (IMMU/HGEN 47300). This lecture course explores the technologies that enable high-throughput collection of genomic-scale data, including sequencing, genotyping, gene expression profiling, assays of copy number variation, protein expression and protein-protein interaction. We also cover study design and statistical analysis of large data sets, as well as how data from different sources can be used to understand regulatory networks (i.e., systems). Statistical tools introduced include linear models, likelihood-based inference, supervised and unsupervised learning techniques, methods for assessing quality of data, hidden Markov models, and controlling for false discovery rates in large data sets. Readings are drawn from the primary literature. *Gilad. Spring.*

Molecular Immunology (IMMU 20266/BIOS25266). Molecular Immunology examines the structural principles of immune recognition by antigen receptors of the innate and adaptive immune system, the discrimination between self and non self and the molecular fundamentals of cell stimulation and signaling. Primary literature is integrated with lectures on commonly used biochemical, structural and immunological techniques. *Adams. Spring.*

Computational Mathematics and Statistics Camp (MACS 33000). This 3-week course reviews fundamental mathematical and statistical tools. Topics to be reviewed include mathematical notation and linear equations, calculus, linear algebra, probability theory, and statistical inference. Students are assumed to have encountered most of these topics previously, so that the camp serves as a refresher rather than teaching entirely new topics. The topics are relevant to statistics/math concepts in biological research such as genomics analysis and data modelling. So it's a great review/refresher course for people interested in interdisciplinary work of computational analysis for cancer biology. Class sessions will emphasize problem solving and in-class exercises applying these techniques. *Staff. Summer.*

Other courses that may be of interest to new or advanced students

Structure and Function of Membrane Proteins (BCMB/MGCB 32300). This course will be an in depth assessment of the structure and function of biological membranes. In addition to lectures, directed discussions of papers from the literature will be used. The main topics of the courses are: (1) Energetic and thermodynamic principles associated with membrane formation, stability and solute transport (2) membrane protein structure, (3) lipid-protein interactions, (4) bioenergetics and transmembrane transport mechanisms, and (5) specific examples of membrane protein systems and their function (channels, transporters, pumps, receptors). Emphasis will be placed on biophysical approaches in these areas. The primary literature will be the main source of reading. *Perozo. Autumn.*

Human Genetics 1: Human Genetics (HGEN 47000). This course covers classical and modern approaches to studying cytogenic, Mendelian, and complex diseases. Topics include chromosome biology, single gene and complex disease, non-Mendelian inheritance, cancer genetics, human population genetics, and genomics. The format includes lectures and student presentations. *Ober, Waggoner, Nobrega. Autumn.*

Protein Fundamentals (BCMB/HGEN/MGCB 30400). The course covers the physical chemical phenomena that define protein structure and function. Topics include: the principles of

protein folding, molecular motion and molecular recognition; protein evolution, design and engineering; enzyme catalysis; regulation of protein function and molecular machines; proteomics and systems biology. *Keenan*. Autumn.

Cell Biology 2 (MGCB/BCMB 31700). This course covers the mechanisms with which cells execute fundamental behaviors. Topics include signal transduction, cell cycle progression, mitosis, checkpoints, cytoskeletal polymers and motors, cell motility, cytoskeletal diseases, and cell polarity. Each lecture will conclude with a dissection of primary literature with input from the students. Students will write and present a short research proposal, providing excellent preparation for preliminary exams. Cell Bio I 31600 is not a prerequisite. *Glotzer, Kovar*. Winter

Molecular Biology 1 (MGCB/BCMB 31200). Nucleic acid structure and DNA topology; methodology; nucleic-acid protein interactions; mechanisms and regulation of transcription, replication and genome stability and dynamics. *Rothman-Denes, Bishop*. Winter.

Introduction to Scientific Computing for Biologists (ECEV 32000). Computing is a challenge for scientists, especially for those not trained in the so-called “hard sciences”. By definition, as scientists we are trying to do something no one has attempted before. As such, no off-the-shelf software is typically available for the analysis we want to perform. Hence the need for at least rudimentary programming skills that are the focus of this course. Data is growing exponentially in size and quality. This data deluge requires better data organization and flow. Agencies and publishers are more and more often requiring scientists to deposit the data and the code for analysis prior to papers’ acceptance. Thus, the organization of code and data should be approached with the same effort we put in papers. Learning how to program efficiently, how to organize code and data, how to automate analysis and how to collaborate with others in these areas are the key goals of this course. *Allesina*. Winter

Advanced Bioinformatics: Genome Analysis (MSBI 32500). This course will follow on from the Introduction to Bioinformatics and will include advanced topics such as: Linux and high performance computing; genomic data visualization; R programming in bioinformatics; and RNA sequencing data analysis. *Various instructors*. Spring

Quantitative Analysis of Cellular Dynamics (DVBI 32000). This course covers quantitative approaches to understanding biological organization and dynamics at molecular, sub-cellular and cellular levels. A key emphasis is on the use of simple mathematical models to gain insights into complex biological dynamics. We also will cover modern approaches to quantitative imaging and image analysis, and methods for comparing models to experimental data. A series of weekly computer labs will introduce students to scientific programming using Matlab and exercise basic concepts covered in the lectures. *Rust, Munro*. Spring

REQUIREMENTS FOR THE PhD DEGREE IN CANCER BIOLOGY

A PhD candidate must have completed graded coursework and rotations, pass an oral examination as the preliminary examination, present an original thesis proposal as the qualifying exam, complete all requirements to remain in good standing, have a successful penultimate thesis committee meeting, and successfully present and defend a dissertation describing their original research findings.

Summary of graded coursework and milestones to be completed:

Graded Coursework:	5 credits, A or B grades
Research Rotations:	1 credit, Pass
Preliminary Exam	Pass
Qualifying Exam	Pass

Graded Coursework

The PhD program in Cancer Biology requires each student to complete the equivalent of at least five full courses and at least two quarters of research rotations for a total of six course credits. To remain in good academic standing in the program, students must receive no lower than a B- in any graded course and maintain a B+ average overall.

Laboratory Rotations

Students must complete at least two research rotations in different laboratories. Prior to beginning a rotation, the student must complete the Lab Rotation Form. For credit, the rotation must be approved by the Curriculum Committee.

- A. Rotations will consist of independent or collaborative research that:
 - 1) provides an opportunity for each student to become familiar with the conceptual and technical features characteristic of potential thesis laboratories
 - 2) broadens the research base of the student
 - 3) allows faculty members to evaluate the research strengths of potential graduate students.

- B. Students should complete two nine-week or three six-week rotations during Winter and Spring quarters. If a student has not identified a thesis advisor, an additional two six-week rotations can be completed in the Summer quarter.

- C. At the end of each rotation:
 - 1) The student prepares a rotation summary to be submitted to the research mentor and the Cluster office.
 - 2) The faculty mentor provides a brief evaluation of the student and recommends Pass or Fail.

Preliminary Examination

PhD students are required to pass an oral Preliminary Examination (prelim) to proceed to their thesis research.

1. Eligibility and Scheduling - Students in good academic standing are eligible to take the prelim at the beginning of Summer quarter of the first year. Students who do not sit for the prelim during Summer quarter may be terminated from the program. In all cases, students must pass the prelim by the end of Fall quarter of the second year to remain in the program.

2. Format - The prelim is in the form of a slide-based and/or chalkboard presentation of a recent peer-reviewed research publication to an Examination Committee of three CCB faculty members. Students will be evaluated on scholarship, knowledge base, understanding of experimental methods and logic, critical analysis, and the ability to synthesize and integrate knowledge. The student should be able to define the significance, analyze and critique the experimental design, and discuss implications and future areas of research. The paper,

members of the Examination Committee and specific guidelines are provided to the students in advance. While the format may change somewhat each year, the guidelines from 2020, which was a remote exam, are attached as an addendum. When feasible, a two-hour in-person exam will be scheduled by the Cluster office. The student will be provided with the paper and membership of the exam committee no more than two weeks before the exam.

3. Potential Outcomes of the Examination - At the end of the prelim, the Examination Committee may choose to meet privately and discuss the student's performance. They will consider the following outcomes: 1) Unconditional Pass; 2) Conditional Pass with suggested actions to address deficiencies; 3) Fail.

All recommendations from the Examination Committees will be reviewed by the Curriculum Committee. For Conditional Pass and Fail exams, the Curriculum Committee will notify students in writing with actions that must be taken to remain in good standing.

Students who fail may petition the Curriculum Committee for an opportunity to retake the prelim. The Curriculum Committee will review the petition and, if approved, determine the date of the make-up exam and select a new Examination Committee. This final Examination Committee will include at least one member of the first committee and at least one member of the Curriculum Committee.

In general, students may only retake the prelim once and must pass before the end of Fall quarter of their second year. Students who have not yet passed the prelim will continue to receive stipend support through Fall quarter of the second year. Students who are unable to pass the prelim by the end of the Fall quarter may petition the Curriculum Committee for a terminal MS degree, which may be granted upon approval by the BSD Dean of Students Office.

Selection of the Thesis Advisor and Co-Mentor

Following at least two rotations and no earlier than the end of Spring quarter but no later than the end of Summer quarter, students will propose a PhD thesis advisor. The prospective mentor can be a member of CCB or another University of Chicago faculty member. In some cases, a student will choose to work on a project that is a collaboration between two labs. Generally, students should discuss with the two faculty members who is best suited to serve as their thesis advisor/primary mentor. The collaborating faculty member can be considered a co-advisor and invited to attend thesis committee meetings, but need not have an official role.

Once the choice of thesis lab(s) is confirmed, the student can then choose their co-mentor, who must be a CCB faculty member and should have distinct training from the primary mentor and not be an active collaborator. Ideally, the co-mentor's research interests will complement the thesis advisor's expertise, offering a distinct perspective. The student does not need to rotate in the co-mentor's lab in choosing a co-mentor. The co-mentor need not assume any responsibility for the student's support. Before students invite a faculty member to serve as their co-mentor, it is important to discuss the choice with the PhD advisor.

The student will complete a Mentor Team Proposal form which must be submitted to the Cluster office and approved by the Curriculum Committee.

Formation of a Dissertation Committee

A thesis committee is formed by each student, in consultation with his or her thesis advisor and the Curriculum Committee. The thesis committee will comprise at least five University of

Chicago faculty members, including the primary mentor and co-mentor, of whom three must be members of CCB.

Committee members need not have expertise in the topic of the thesis project. Often, scientists from other fields can be more patient and are better at appreciating progress and accepting failures during the first two or three years of a thesis project. Experience with training graduate students is probably more important than any scientific expertise.

In general, students should meet with prospective members of their thesis committee to present their project ideas and receive feedback before formally requesting they join the committee. Also, note that a CCB faculty member can only serve on three thesis committees at any time. Thus, students may need to consider a wider list of faculty members for their committees.

Once sufficient faculty agree to serve, the student will submit a Thesis Committee Proposal form to the Cluster office to confirm that the members are qualified and to obtain approval by the Curriculum Committee. This must be completed before the end of Fall quarter of the second year.

Membership of the thesis committee can evolve over time, with approval of the Curriculum Committee. Membership may change to reflect a shift in experimental focus, the student moving to a different research group and new mentorship, or the arrival or departure of faculty members. Faculty members with special expertise who are from outside institutions can be added, but cannot replace University of Chicago faculty members.

Thesis Proposal and Qualifying Examination

To be considered a candidate for the PhD, students must complete the qualifying examination (qual exam), which consists of a thesis proposal and its successful presentation to the thesis committee. Normally, the qual exam will be completed in the Winter quarter of the second year and must be passed no later than the Spring quarter of the second year. Per Divisional policy, students must pass the qual exam by the end of their ninth quarter in residency to remain in a PhD program.

Note: While a first year student can join a thesis lab at any time after Spring quarter of the first year, they may not submit a thesis proposal until they are in good standing in the CCB program and divisional requirements for candidacy have been met.

The thesis proposal document should follow the current guidelines for an NIH R01 research project grant with regard to content and format. Briefly, the document will be a PDF formatted in Arial font, 11 point, single-spaced, left justified, with a 1-3 point gap between paragraphs, with one-half inch margins. It may be no more than thirteen pages for the Research Plan (Specific Aims and Research Strategy) and any additional pages required for the References Cited, Vertebrate Animal Studies, Human Subjects, or other additional information. The first page will be the Specific Aims. The second through twelfth pages will be the Research Strategy, consisting of Significance, Innovation, and Approach as the major sections. There is extensive guidance on how to format an R01 online and plenty of guidance on what information is appropriate for what section. The proposal should be prepared with input from the primary mentor and co-mentor. Students are encouraged to draw on other members of the laboratory for help in proper design and description of experiments.

Everything presented in the thesis proposal Research Plan must be the original work of the student. No data may be presented in the thesis proposal that was not obtained by the student. All diagrams and other graphics must be their original work as well.

Students should contact their thesis committee members well in advance to schedule their qualifying examination meeting, which is typically the first meeting of the committee as a group. A two hour meeting should be scheduled. All members of the student's thesis committee must be available to participate for the full meeting, whether in person or by video. The date, time and the location must be shared with the Cluster office, as well as an abstract for the proposal.

PDF copies of the proposal must be sent to each member of the thesis committee and a copy to the Cluster office no less than one week prior to the scheduled date of the meeting. If a student fails to meet this minimal requirement, the Curriculum Committee may choose to cancel the exam. Prior to or at the beginning of the meeting, the committee should confer and agree that the thesis proposal is satisfactory. If not, then the student is given a Fail and the meeting is cancelled or ended.

If the proposal is deemed acceptable, the thesis committee will designate a chair who must be a member of CCB and cannot be the thesis advisor or co-mentor. Then, the student will join the meeting and present their project using slides, generally following the structure of the thesis proposal, beginning with hypothesis and aims, then background, preliminary studies, proposed experiments and timeline. As with the proposal, only the student's own work may be shown in figures or diagrams. Other work from the thesis lab or other labs can be described but not shown. The committee will question the student to evaluate their scholarship and mastery of the topic, the rigor of their plans, and the feasibility of success over three or four years. The mentor and co-mentor may participate in the discussion, but should not answer questions posed to the student.

At the end of the presentation and questions, the thesis committee may choose to meet privately and discuss the student's performance. They will consider the following outcomes: 1) Unconditional Pass; 2) Conditional Pass with suggested actions to address deficiencies; 3) Fail. The Curriculum Committee will identify the appropriate course of action to address a Conditional Pass or Fail and transmit their decision to the student and mentors. Students will be given one opportunity to retake the quals.

Master of Science Degree

Students who have completed all requirements for candidacy for the PhD may apply for a Master of Science degree. There are rare circumstances where the (transitional) MS degree may provide an advantage to students competing for external funding during their studies. Alternatively, for students who choose to leave the program prior to defending their thesis, the (terminal) MS offers a professional degree that can be used to document their accomplishments and offer access to better job opportunities. In general, to be eligible for the transitional or terminal MS, students must have completed a minimum of five graded courses with a minimum GPA of 2.75 and have passed Preliminary Examination.

Regular Meetings with the Dissertation Committee

Students are expected to meet with their thesis committee at six to nine month intervals, but at least yearly. The frequency of these meetings will be determined by the thesis advisor and committee chair in consultation with the student. However, yearly meetings are the minimum frequency. Lacking guidance from their committee, students must take the initiative to schedule

meetings. Students who have not met with their thesis committee in over a year may be asked to leave the program.

Thesis committee meetings must be scheduled to allow all members of the committee to attend in person or by video for at least an hour and a half. The date, time and location must be provided to the Cluster office well in advance. A week before the meeting, students should submit a two-page progress report as a PDF to the committee members and the Cluster office. The report should state the current aims, provide a concise summary of progress since the last meeting, and outline milestones for the next nine to twelve months. A brief update of less than one page on progress on IDPs is also required. At the beginning and end of the meeting, committee members may meet privately to discuss progress. Following the meeting, the committee chair will submit a written evaluation of the student's progress. This report will be shared with the student and the Cluster office.

Submitting Fellowship Proposals

In order to receive a grade for Hypothesis Design and Grant Writing Skills (CABI 31600), students must submit a fellowship or research grant proposal to an external funding agency, depending on eligibility and topic. Citizens and permanent residents may apply for an NIH NRSA or NSF GRFP, but like foreign nationals, they may choose other opportunities such as grants from CDMRP, private foundations, or other sources. In rare cases, the thesis advisor might need to serve as PI rather than sponsor. This proposal should be submitted during the second year and no later than the third year.

Teaching Assistantships

Divisional requirements mandate that each student complete two TAs, which can be any undergraduate or graduate course where the course director/instructor is a member of CCB. Responsibilities are defined by the course director/instructor and may include leading discussion groups, writing problem sets, and running small group sessions. At the end of each course, TAs are evaluated by the course director/instructor and the students. TAs will also evaluate themselves. All three evaluations must be returned to the BSD Office of Graduate Affairs (OGA) to receive credit for the TAs. Note: Students may not TA the same course twice in fulfillment of this requirement.

Scientific Integrity and Ethical Conduct of Research

The University offers an annual course encompassing formal seminars by faculty lecturers in areas pertaining to proper handling/reporting of scientific data and ethical considerations in research. The University of Chicago requires that all predoctoral and postdoctoral trainees, clinical researchers, and junior faculty attend the program on the responsible conduct of research. Different aspects of scientific ethics are covered each week, each led by one or two faculty members. The format varies, including faculty presentations followed by group discussions, faculty presentations with question and answer periods within the presentation time, or case study discussion. The attendees are required to complete two written assignments based on video vignettes from AAAS and written case studies, and to make small-group presentations to the rest of the class.

Seminars

In addition to formal courses and seminars, there are many regularly scheduled research seminars across the BSD that will help to keep students up-to-date on new developments in your field of research and related disciplines. CCB event notices will be sent to students' UChicago email address. Other upcoming events are announced in a daily email called MyBSD: birenheide.com/uchicago/events/allevnts.php

Individual Development Plans

All CCB students are required to draw up an Individual Development Plan to promote both effective mentoring by their PI and thesis committee, but also to help ensure that appropriate career goals are achieved by the student in a timely manner. The IDP is drawn up on an (approximately) annual basis, in parallel with their preliminary exam, thesis proposal defense/qualifying exam at the end of their second year, and subsequent committee meetings. In addition to strong and early performance in their research project and plans for publication, IDP plans should also include mention of attendance at major symposia, as well regular seminars and meetings with outside faculty, and application for pre-doctoral fellowships. Additional components include discussion of when and how to apply for both post-doctoral fellowships, early contact with potential post-doctoral mentors, alternative career options and interaction with the Office of Career Advancement, who can work with students individually to prepare materials and provide assistance in effective career development.

The Biological Sciences Division mandates that students use the following interactive web form for their individual development plan: myidp.sciencecareers.org. Part of the plan requires consultation with a mentor – this mentor may be the student's thesis advisor, but may also be any individual with a mentoring relationship to the student (other faculty, advisors in the Graduate Affairs Office, other science professionals). Once completed, students must send the certificate of completion to the cluster office. IDPs may be discussed at the thesis committee meetings at the students' discretion; they are a confidential document that are presented only at the students' thesis meeting and in discussion with their PI and program director.

Changing projects, switching labs and leaving the program before the PhD

Most students face adversity during their doctoral training. Graduate school is a safe place to fail, but success is needed to complete the degree. Thus, while meeting scientific challenges is an important part of earning a PhD, some hurdles cannot be overcome, meaning change is necessary. In general, any major revisions to the project must be made in consultation with the thesis advisor and thesis committee. Changing the thesis project substantially is normal and may not delay completing the degree, particularly when students and advisors stay in close alignment. Completely abandoning a project may require a new thesis proposal be submitted to the thesis committee. It is important to make sure that any thesis meeting where a substantial change in the project aims or objectives is discussed be documented and the outcome transmitted to the Curriculum Committee.

Particularly early on in their studies, students may opt to leave their thesis lab due to personal or scientific issues. A thesis advisor moving to a new institution or losing funding may precipitate a change in labs. Alternatively, students may lose the confidence of their thesis advisor and/or thesis committee. Generally, any student who can identify a new thesis advisor who is able to make the financial commitment necessary can remain in the CCB program or change to another BSD program. The BSD normally provides a quarter of support to facilitate these transitions. Students who cannot identify a new thesis advisor or who simply choose to leave the CCB program and/or the BSD can apply for a terminal Master of Science degree. MS only students are considered alumni and encouraged to remain part of the CCB community.

Probation and Dismissals (modified from the BSD/OGA Transfer-withdrawal Policy)

If an advanced student is deemed by the thesis committee to be making insufficient progress, the student can be placed on formal academic probation. Probation requires a clear set of written expectations that are approved by the program chair to be provided to the student. The timeline in which these expectations need to be met should also be clearly stated. The Office of Graduate Affairs will be notified when students are placed on probation. The thesis committee

chair and program head are responsible for assessing whether the terms of the probation period have been adequately met. In cases where a student is unable to meet expectations by the end of the probation period, the program will recommend that the student be dismissed from the Division of Biological Sciences. A recommendation for a student to be dismissed from the BSD graduate programs must be approved by the Associate Dean of Graduate Students, in consultation with a standing Faculty Committee on Student Withdrawals. Students may appeal the recommendation of dismissal in a letter addressed to the Associate Dean of Graduate Students who may convene a formal meeting with the standing Faculty Committee on Student Withdrawals to review this recommendation. Attendance at this meeting will include the student and program faculty. Combined degree students must follow the same policies as the other PhD students.

Student Progress Toward Degree and the Penultimate Meeting

Students are normally expected to write and defend a thesis by the end of the fifth year. Once a student believes that they have made substantial progress on their thesis research, they should begin to discuss a timeline for completing their studies with their thesis advisor and co-mentor. This should also be a topic of discussion at each thesis committee meeting.

Once general agreement is reached between the student and thesis advisor that key milestones have been achieved, students should then schedule a penultimate meeting with the thesis committee to present specific plans for the thesis and defense. This meeting should take place during the fifth year and approximately three months before the student plans to defend. By the time of the penultimate meeting, the student must have at least one first/co-first author, peer-reviewed paper published or in press with their thesis advisor as a corresponding/senior author reporting their original research. If not yet published, the accepted draft must be posted on a public archive or otherwise made available. At least a week before the meeting, the student should send their committee members and the Cluster office a PDF report describing their major findings to date, links to all published or posted papers, and an outline of the proposed thesis chapters and their content. Only very limited additional experiments should be anticipated after the penultimate meeting to be included in the thesis.

Following a private discussion of the student's progress with the thesis advisor and co-mentor, the student will present their major findings and thesis plan. All committee members must agree that the work done to date is sufficient for a PhD degree. If the thesis committee agrees that the student is ready to write and defend, the student may go ahead and schedule their defense.

At the end of five years in graduate residence, students who have not yet completed their penultimate meeting must petition the Curriculum Committee to continue in the program. The student must outline the reasons why progress has been delayed and how these issues will be addressed. The thesis advisor must co-sign the request. The Curriculum Committee will arrive at a decision in consultation with the thesis committee. Approval from the Curriculum Committee is required for the student to continue in the program.

Dissertation Defense Guidelines

Each student is responsible for the preparation of a written detailed discourse describing their thesis project in the form of a dissertation. The dissertation is written upon completion of the majority of the experimental work and approval by the thesis committee. The format should follow the guidelines posted on the PhD Dissertation Office Website lib.uchicago.edu/e/phd/. Once the thesis advisor confirms that the document is satisfactory, the student can submit the dissertation to the other thesis committee members for their review.

Once the dissertation has been submitted to the thesis committee, each member has two weeks to review the document and transmit any comments concerning major deficiencies to the student. The student is expected to prepare a revised version of the dissertation addressing these deficiencies (usually within a two week period). The revised version of the dissertation document must be returned to the thesis committee members no later than one week before the oral defense date.

It is recognized that each thesis project, and therefore each dissertation, will be different. As such, no specific requirements should be instituted for its length or content. However, it is expected that the vast majority of dissertations should conform to the following guidelines. The student is encouraged to review selected dissertations in the program office for examples of format, content and quality.

Briefly, assuming the typical thesis format at The University of Chicago of one-inch margins, double-spaced text and Times New Roman 12 point font, a typical dissertation might be assembled as follows:

- a) The total length of the document should normally be 125 - 250 pages (inclusive), in order to provide the level of detail expected of a document of this nature.
- b) The Introduction chapter should be 30 - 50 pages long. It should contain a scholarly description of the background relevant to the thesis topic, up to the current day. All graphics must be original work, although limited historical data that established key paradigms may be shown if appropriate.
- c) The Materials and Methods chapter should be 20 - 60 pages long. It should describe the details of all experiments used, even those that have been published elsewhere, with proper citations. This section should be able to serve as a useful laboratory resource for future generations of investigators in the research group.
- d) The Results chapter should be 60 - 100 pages long, including figures and tables. In general, the figures and tables should occupy 1/2 - 1 page each. There should be no "data not shown". Figures should be original or published by the author. Published papers should be adapted to the thesis format rather than included in their published form.
- e) The Discussion chapter should be 10 - 20 pages long. This section should be a scholarly discourse that puts the thesis work in the context of the relevant fields. Related work of others, and differences in experimental outcome or interpretation should be addressed. The student should clearly indicate what is new or unique about his/her work and how it contributes to the field. The quality of the Introduction and Discussion sections should be such that they could form the core of a review article suitable for publication in a peer-reviewed journal.
- f) A Bibliography should typically include several hundred references that covers the full range of historical and current literature relevant to the topic and goes well beyond what is typical of publications.
- g) The Addendum should include any data tables and other information that are needed to interpret the Results.

Some students may elect to prepare the thesis with multiple Results chapters that are adapted from their published manuscripts. Each chapter must be edited and reformatted to be consistent with the rest of the dissertation. In general, each such chapter may include a focused Introduction, an expanded Results section with additional detail on experiments and with all figures removed that are not the work of the student, and a short discussion. The Materials and Methods for published papers are not sufficient for a thesis and should be expanded and incorporated into a single Materials and Methods chapter of the thesis. Independent of what is presented in the Results chapters, scholarly Introduction and Discussion chapters are still required.

Thesis Defense

The thesis defense is composed of a public defense followed by a private defense.

The first part is a public seminar presented to the CCB community, with the thesis committee in attendance. There is no set format, but CCB thesis defense talks should be in the structure of a regular scientific seminar or job talk, loosely based on the dissertation. They should provide a scholarly background suitable for a broad audience of cancer biologists, a clear presentation of the research project and its findings, and an honest discussion of the context and implications of the work. The audience will provide questions while the thesis committee will reserve their questions for the private defense. Friends and family without scientific training are welcome to attend the public defense and may even ask questions if they are relevant to the presentation. However, the seminar should be presented at a level that would be appreciated by a PhD scientist and acknowledgments should be a single slide and restricted to professional rather than personal appreciation.

The second part is a private defense by the student in front of the thesis committee and any other invited faculty on the examination committee. The private defense covers the thesis project as presented in the public defense and the dissertation document. Since this is the last opportunity the committee has to ensure the quality of our graduates, the private defense will continue until each member is satisfied with the student's performance or until the committee decides that the student has failed the defense examination. Even though the committee may feel comfortable that the student has passed the examination, the PhD requirements are not complete until the committee is satisfied with a final, fully formatted and revised version of the thesis document. At that point, the Final Exam form is signed by each member of the thesis committee and provided to the Cluster office.

It should be noted that the thesis requirement is not fulfilled from the perspective of the University until the student has submitted the dissertation electronically and received confirmation from the Dissertation Office that it is complete. The University web site has invaluable information regarding the preparation of the thesis and various deadlines.

The link is <https://www.lib.uchicago.edu/research/scholar/phd/> .

Students are responsible for scheduling their thesis defense based on the availability of the thesis committee members. Once a date and time are set, this must be shared with the Cluster office.

Note that scheduling the defense too late in a quarter so that the dissertation cannot be approved in time for the convocation may result in the degree not being conferred until the next quarter. This has significant implications insofar as following a successful defense, neither the mentor nor the program will be held responsible for providing stipend or tuition support for the

next quarter. However, a student cannot transition to a post-doctoral appointment at the University until the degree is conferred and may have a similar constraint to accept other positions. Special attention must be given in regards to this transition to avoid a gap in salary and/or health or other benefits.

With this in mind, please take note that:

- a) Students must apply to graduate by the end of the first week of the quarter that they plan to graduate.
- b) The deadline for submission of the approved thesis and all necessary documents is the Wednesday three and a half weeks before convocation for that quarter.
- c) All dissertations must be submitted electronically.
- d) Graduation without registration policy:
 - i. Doctoral candidates who submit their approved dissertation to the Dissertation Office by Friday of the first week of a quarter and apply to graduate in that quarter will not have to register as students in that quarter and thus will not pay the associated fees.
 - ii. Please note the BSD Policy varies slightly from the University Policy. The BSD policy is as follows: Students who take advantage of the graduation without registration policy will not have any benefits or privileges in the non-registered quarter in which they graduate. Benefits and privileges of registered students include stipend, access to the student health center and other university facilities tied to full-time registration, and continuing loan deferral.

Below is a chart indicating the quarter a student wishes to graduate without registration and the BSD dissertation submission deadline.

Graduating Quarter	BSD Dissertation Final Submission Deadline
Autumn 2019	Friday, September 11, 2020
Winter 2020	Friday, December 11, 2020
Spring 2020	Friday, March 19, 2021
Summer 2020	Friday, June 11, 2021

Graduation

Once the student knows that they are ready to begin writing the dissertation and plans to graduate, they should notify the Cluster Office immediately. The student will also need to update their expected graduation date via their myUChicago account. Once updated, the graduation form will populate within the account and must be completed no later than the first week of the quarter in which they plan to graduate. This is a hard deadline and the Registrar's office will not grant an exception if it is missed.

After the committee has signed off on the defense and accepted the dissertation, it can be submitted on the ETD site. The Cluster office will be notified when this is complete, and will ensure that the program chair receives a copy to review. Once the chair signs off on the Departmental Approval Form, it is submitted to the Dissertation Office as final approval. This is the final step in completing the graduation requirements.

Information regarding convocation can be found here: convocation.uchicago.edu

REGISTRATION

General Information

About one week before the dates designated for registration, the Cluster administrator will email the students informing them of the days and times when they should register. First year students will meet with the Cluster administrator to discuss procedures during Orientation Week.

Leave of Absence

A student may apply for a Leave of Absence from the PhD program for a maximum of 6 months. The leave must be approved by the chair.

Pro-Forma Registration

Students whose thesis research requires them to spend a prolonged period away from campus, for example to perform experiments in a collaborating lab at another institution, may register pro-forma. This provides registration as a full-time student with reduced tuition. Pro-forma status establishes a good faith relationship between the student and the University. The following regulations apply:

- a) Pro-forma registration is approved for only one academic year at a time.
- b) Applications for pro-forma registration must be approved in writing by the chair.
- c) Students applying for pro-forma status must have been admitted into candidacy and have had dissertation topics approved.
- d) An applicant for renewal of pro-forma status must show that additional time is essential to completing the original task. Renewals of pro-forma status must be approved by the Dean of Students.
- e) A student on pro-forma status may not be gainfully employed for more than 19 hours per week.
- f) Pro-forma students may not use the facilities of the University or the time of its faculty, except for progress reports that may be required by the students' departments.
- g) A copy of the approved applications must be filed with the Registrar.
- h) The Registrar will certify that a pro-forma student is duly registered at the University to any agency requiring such certification.
- i) The fact that a registration is pro-forma will be noted on the student's academic record.
- j) Pro-forma registrations do not count toward satisfying a student's residence requirements toward a degree.
- k) Students must have satisfied all course requirements, including Scientific Ethics and completed TAsHips.

FINANCIAL SUPPORT

All students registered in the PhD program are provided with adequate financial support. The Biological Sciences Division has made a formal commitment to our graduate trainees, with full support guaranteed through the student's first five years of study, conditional on satisfactory degree progress. This support will be extended to completion of degree in all but the most unusual of circumstances. Current support is described here:

<https://biosciences.uchicago.edu/admissions/financial-support>

Specifically, financial support for tuition, fees and stipend is guaranteed to all incoming students for their first four quarters of study. Continued support is subject to satisfactory academic performance, including coursework and Preliminary Examination, and then satisfactory research progress for advanced students, as determined by the CCB Curriculum Committee and the Division of Biological Sciences.

Sources of Support

Students receive tuition, payment of fees, plus a stipend. The various sources of support include:

- Training grant fellowships
- Individual, external fellowships
- University fellowships
- Research assistantships

A list of current fellowship awardees from CCB and other programs is here:

<https://biosciences.uchicago.edu/current-students/accomplishments/fellowships>

Payment of Stipend

The 2020-21 stipend is \$33,652 per year. This is a minimum, irrespective of the source of support. Some competitive fellowships may pay a higher stipend.

Fellowship stipend checks are paid in equal quarterly installments at the beginning of each quarter and cover the calendar year. Taxes are owed on, but not deducted from, these stipend checks (see section on "Taxes" below).

Most advanced students will be paid from their advisors' funds under the title "Research Assistant Type B" (RA-Type B). RA-Type B students are paid on a monthly basis on the last working day of each month. Taxes will be deducted from the RA-Type B checks.

University fellowships and NIH training grants pay for student health insurance, fees, and tuition without the student having to make separate payments.

Health Insurance and fees are included in RA-Type B monthly stipends. Students should complete a payroll deduction form so their student health insurance and fees are automatically deducted from their monthly check. Not completing a payroll deduction form will require the student to pay for these costs, upfront and in full, prior to the start of each quarter. The Cluster office and Office of Graduate Affairs will be in contact with students who need to complete this form in advance of the deadline.

Quarterly stipends are paid on the first day of the quarter for that quarter while monthly stipends are paid on the last working day of the month. *****When transitioning from quarterly to monthly, the last quarterly check must last four months. It is highly suggested that each month, while being paid quarterly, a small amount be set aside in a savings account to help during the transition month to monthly payroll.***** If this becomes a problem, see the section “Loans” below.

For any questions about stipend checks, please contact the Program administrator.

Taxes

Graduate student quarterly stipends are taxable by the State of Illinois and the Federal governments. Though taxes are not taken out of these checks when they are paid out to the student, students on training grant or fellowship support must file taxes and calculate and pay estimated quarterly taxes. IRS form 520 provides information on determining what portion of your stipend is taxable and how and when to pay taxes you owe. The forms are available from the IRS. Regenstein Library also carries tax forms (Reserve room, First Floor), particularly after January 1. The forms can also be found online.

Loans

Information on the various types of loans available to graduate students is available from Graduate Financial Aid. This office can provide short-term loans during temporary financial crises. The office also has up-to-date information on federally-sponsored student loan plans. Loan applications are available at financialaid.uchicago.edu, and are processed through Graduate Financial Aid.

MISCELLANEOUS CAMPUS INFORMATION

THE GORDON CENTER FOR INTEGRATIVE SCIENCE (GCIS)

This interdivisional research facility encompasses 420,000 square feet providing offices and laboratories for approximately 100 faculty (929 East 57th Street). The GCIS houses BSD departments including the Ben May Department for Cancer Research, the Department of Biochemistry and Molecular Biology, and the Howard Hughes Medical Institute. Physical Science Department (PSD) includes the Institute of Biophysical Dynamics, the Materials Research Science and Engineering Center, the James Franck Institute and the Chemistry Department.

THE BIOLOGICAL SCIENCES LEARNING CENTER (BSLC) AND JULES KNAPP MEDICAL RESEARCH BUILDING (JFK)

The Biological Sciences Learning Center and Jules F. Knapp Medical Research Building is located at 924 East 57th Street, across from the GCIS Building Atrium Entrances. The Learning Center (south half of the building) provides classrooms for undergraduate, graduate, and medical programs. In addition, the Office of Graduate and Postdoctoral Affairs (OGPA) and Office of Medical Education (OME) for the Division of Biological Sciences are located in the Learning Center. The Knapp Building (JFK - north half of the building) houses laboratories, research facilities and faculty offices in the areas of molecular cardiology, immunology, oncology, and neurobiology.

THE GWEN AND JULES KNAPP CENTER FOR BIOMEDICAL DISCOVERY BUILDING (KCBD)

The Gwen and Jules Knapp Center for Biomedical Discovery Building is located next to the BSLC & JFK Buildings (900 East 57th Street). The Center includes the Ludwig Center for

Metastasis Research, Beverly Duchossois Cancer Laboratories, Kovler Diabetes Center, Institute for Genomics and Systems Biology, and researchers from the Departments of Pediatrics, Department Biochemistry and Molecular Biology, and Department of Medicine Sections of Gastroenterology, Endocrinology, and Hematology/Oncology.

Bursar's Office

The Bursar's Office, located at 6030 South Ellis Avenue, 2nd floor. (Hours: Monday through Friday, 9:00 am to 4:00 pm).

Information can be found at: bursar.uchicago.edu

Main Phone Number	2-8000
Tuition Inquiries & Bursar Restrictions	2-7086

University Ticket Center

The University Ticket Center, located in the Reynolds Club, sells tickets to most campus events including Major Activities Board concerts, Rockefeller Chapel productions, Music Department concerts, and Summer Nights productions.

Student Health Insurance:

Graduate students have access to coordinated and comprehensive medical care, counseling, psychiatry, and health promotion services through student health insurance (USHIP). Information regarding services offered can be found at: <https://wellness.uchicago.edu/about/>

Student Health Center

Please refer to documentation distributed during University and Divisional orientation. The website is: healthcare.uchicago.edu

Student Counseling Service

Student counseling is a separate service from the Student Health Center. They are located at 5555 S. Woodlawn Avenue and provide a broad range of mental health services, including needs assessment, psychotherapy, psychiatric consultation, academic skills assessments (time management, stress management, interpersonal issues), support groups, referrals, emergency services and health promotion and wellness programs.

Their website is: <http://counseling.uchicago.edu/>

Lost and Found

The Office of the Registrar (Administration 103, 2-7891) serves as a collection point for items found in the University's academic buildings and quadrangles. For items found in the University Medical Center, the Office of Medical Center Security (Room AMB M-12, 2-1583 or Security Dispatch AMB M41, 2-6262) serves as the collection point.

TRANSPORTATION

UGo Shuttles

UGo Daytime Shuttles: The University provides free daytime shuttle service around campus and portions of the neighboring communities. Shuttles are a safe and convenient way for all students, faculty, staff, University of Chicago Medicine staff and Laboratory and Charter School students and staff to get around. Shuttles include Midway Metra, Friend Center and Metra, Drexel, Apostolic, Apostolic/Drexel, 53rd Street Express, and Polsky Express.

UGo NightRide Shuttles

The University provides a comprehensive nighttime shuttle service that travels throughout the campus as well as the Hyde Park neighborhood. NightRide shuttle routes are within one to two blocks of nearly every building on campus. Routes are designed with specific University destinations in mind to make traveling around campus more convenient. All College Housing residence halls are designated as a stop. NightRide shuttles include North, South, East, and Central routes and the South Loop Shuttle.

The UGo shuttles run year-round, except on University-observed holidays. To ride the shuttles, passengers should tap a valid UChicago-issued ID, University of Chicago Medicine ID, or Laboratory Schools or Charter School ID.

To learn more about the UGo shuttles, and to see route maps and hours of operation, see <https://safety-security.uchicago.edu/transportation>

To track any of the UGo shuttles, as well as CTA buses that operate on or near campus, use TransLoc in a browser (<http://uchicago.transloc.com/>) or the app on your phone.

Umbrella Service

Anyone within the University Police coverage area may request a police escort at any time if they feel uncomfortable with their surroundings. Call 773-702-8181 and give your location; the first available patrol car will be dispatched to accompany you as you walk to your destination. You may also call the University Police dispatcher at 123 from any campus phone.

Website: <http://uchicago.edu/safety/resources.shtml>

CTA Bus and L and Metra trains

The University partners with the Chicago Transit Authority (CTA) to provide three area bus routes: 171, 172, and 192 Express. There are also several other CTA routes that serve the area, such as the 2, 6, and 55. Students ride the 170, 171, and 172 free with a UCID. Regular CTA fares apply for the other bus routes. Passes can be purchased at the Chicago Card Office in the Regenstein Library, Room 100F, Monday-Friday, 8:30 am-5:00 pm or by visiting transitchicago.com or calling 1-888- YOUR-CTA.

Commuters can use the “nearby” CTA L Green Line and Red Line stops on Garfield or Metra rail with stops in Hyde Park.

Parking

The Parking unit of Transportation & Parking Services is responsible for the development and execution of approved parking policies, administration of the parking system, collection of approved fees and the enforcement of parking regulations. Free street parking is available around campus, but fills up rapidly. You may obtain an assigned parking space on campus by paying a monthly fee, which differs by lot. The Ellis Parking Garage would be most convenient and safe for most CCB students, and costs \$110 a month. Assignments for campus lots are available at the Campus Parking Office, 2-8969, located at 5525 South Ellis Avenue.

Website: <http://safety-security.uchicago.edu/transportation/>

Email: parking@uchicago.edu

RECREATION ON AND NEAR CAMPUS

General Information

Facilities

The Reynolds Club, located at 5706 S. University Ave., is the University's primary student center and is often thought of as the hub of student life. The building offers a variety of dining options, as well as performance spaces and meeting rooms to be reserved for students free of charge.

Also located in the building:

The Reynolds Club is home to *Hutchinson Commons*, a food facility serving a plethora of food options, including pizza, Indian cuisine, sandwiches, sushi, and more. The building also houses two coffee shops.

WHPK, the University's legendary radio station, is located in the Bell Tower of the Reynolds Club. WHPK, "The Pride of the South Side", has been broadcasting to Hyde Park and the South Side of Chicago for over 50 years and is dedicated to playing non-mainstream music and providing a voice to the community and local politicians about local and global concerns. WHPK Website: whpk.org

University Theater, located at the Reva and David Logan Center for the Arts, is the oldest running College Theater program in the country. Since its inception in 1898 University Theater has been responsible for the production of over 3, 000 productions. Website for University Theater: taps.uchicago.edu

Ida Noyes Hall, located at 1212 E. 59th Street, is an 82, 000 square foot facility originally designed to be a women's gymnasium and social center at the University of Chicago. Over the years, the facility has undergone modest changes and has hosted many events, large and small, for the University community. The central goal of Ida Noyes Hall is to provide facilities and services to student organizations and university departments.

Ida Noyes Hall is also home to Career Advising and Planning Services (CAPS), which is located on the 2nd and 3rd floors of the building, the Maroon (located in the Lower Level), and The Pub* (also located in the Lower Level). Each year, Ida Noyes Hall hosts a variety of RSO activities, department events, corporate recruiting sessions, parties, and special events.

The Ida Noyes gymnasium was converted into Max Palevsky Cinema in 1987. Since that time, Doc Films has been screening movies every night of the academic year.

Websites:

Main Portal Website for Office of the Reynolds Club & Student Activities:
studentactivities.uchicago.edu

CAPS: careeradvancement.uchicago.edu

Maroon: maroon.uchicago.edu or chicagomaroon.com

The Pub: studentactivities.uchicago.edu/orcsas-pub

Doc Films: docfilms.uchicago.edu/dev/

Dining: dining.uchicago.edu

Your University of Chicago Connections

Quick Links List:	uchicago.edu/quicklinks
UChicago Home:	uchicago.edu
About UChicago:	uchicago.edu/about
UChicago Chronicle:	chronicle.uchicago.edu
Maroon Athletics:	athletics.uchicago.edu
The UChicago Maroon:	chicagomaroon.com
The University of Chicago Magazine:	mag.uchicago.edu
University News Service:	news.uchicago.edu

Chicago

Chicago is a fantastic city for music, theatre, and dining out. The Chicago Symphony, the Lyric Opera, Music of the Baroque, jazz, and blues clubs, the Goodman Theatre, and off-loop theatres are all excellent. Both inexpensive ethnic restaurants and expensive special-occasion restaurants abound.

Information on events in Chicago is plentiful (see below). One of the best sources is the monthly *Chicago Magazine*, available at most newsstands. *Chicago Magazine* rates restaurants, compiles a complete calendar for the coming month, and generally includes a feature or two on getting the most out of the city. The Friday and Sunday *Sun-Times* and *Tribune* have good sections on the week's events. In addition, the *Reader*, available free in the Reynolds Club, the Bookstore, and Regenstein Library (delivered Thursday night or Friday morning), has great information on music, movies, dance and shows.

Chicago Neighborhoods

Chicago is home to over 70 distinct neighborhoods and communities. The university offers online resources to help graduate students find a new home:

<https://grad.uchicago.edu/life-at-uchicago/housing/>

and a PDF resource guide:

<https://grad.uchicago.edu/wp-content/uploads/2018/09/GRAD-Housing-Resource-Guide-8.7.18.pdf>

Purchasing a condo may be an option, but most students rent. The following are some of the most common neighborhoods that CCB students have chosen to live in:

Hyde Park

For students who prefer to live close to the lab, Hyde Park is the neighborhood of choice. It provides the most accessibility to campus, has a wide range of housing available and plenty of dining and shopping. Most students are able to walk to campus, bicycle, use the UGo shuttles or take the 171 or 172 CTA buses that are free for students. The Museum of Science and Industry, as well as the Lakefront Path, which runs parallel to the entire city, are fun activities in Hyde Park. The Promontory Point and 57th Street Beach are spectacular. 53rd Street in Hyde Park has many shops and restaurants that are roughly a 15 minute walk from campus. Whole Foods and Trader Joe's supermarkets are on Lake Park Avenue. In addition, families can stay at several hotels within the Hyde Park area, including the Sophy Hyde Park (<https://sophyhotel.com>) and the Hyatt Place Chicago-South/University Medical Center

<https://www.hyatt.com/en-US/hotel/illinois/hyatt-place-chicago-south-university-medical-center/chizu>).

Nearby

Kenwood, the leafy neighborhood just North of Hyde Park, is popular with faculty and is convenient, though a longer walk or bicycle ride. Although apartments South of Hyde Park in Woodlawn and South Shore or North and West of Kenwood in Bronzeville are convenient, can be quite comfortable and may be less expensive, coming and going late at night can be challenging.

Students with a family who want to live outside the city in a house with a yard can find affordable options a short drive away in the South suburbs and Indiana.

South Loop

For students that prefer to be near the Loop, or downtown area, the South Loop is also another area which many students call home. The South Loop mostly consists of high-rises and is close to some of the city's most popular attractions, including the Field Museum, Grant and Millennium Park, and Soldier Field. Students who live in the South Loop can choose to drive to campus, which takes no more than 15 mins, bicycle, take the 192 UChicago Express CTA bus, or utilize the Metra train.

Streeterville

The Streeterville neighborhood is in the Loop, East of the Magnificent Mile, with many modern high rise rental apartment buildings to choose from. Prices can be high but convenience and access to the city and lakeshore may offset that for some students.

Lincoln Park

Lincoln Park is one of the most desirable neighborhoods in the city due to the numerous shops and restaurants within the area, as well as its close proximity to downtown. Lincoln Park is home to the namesake zoo, Lincoln Park Zoo, which is free. Other notable attractions within the area include the Chicago History Museum and the Peggy Notebeart Nature Museum. Traveling to campus is simplest by car (20 minute drive) but is reasonable by L (Red Line) or CTA bus.

Lakeview

Lakeview encompasses a number of neighborhoods located on the far-North side of the city. Lakeview provides students the opportunity to live in a quiet neighborhood, filled with bars and restaurants of many different cuisines, but also lie in close proximity to Wrigley Field, home of the Chicago Cubs. Traveling to campus is most practical by car (25 minute drive) but tolerable by L (Red Line) or CTA bus.

Chicago on the Web

City of Chicago: cityofchicago.org

Centerstage Chicago (music, food, bars, film, theater, etc.): chicago.com

Metra Train Schedules: metrarail.com

Festivals and Exhibits

Ravinia Music Festival - all summer long, a wide variety of music: ravinia.org

Chicago Symphony Orchestra, jazz, country and more in a beautiful outdoor park: cso.org

Movies in the Park – Movies in various parks in Chicago throughout the summer months: <http://www.chicagoparkdistrict.com/events/movies/>

Millennium Park Concert Series – Various music and dance events at Millennium Park:
https://www.chicago.gov/city/en/depts/dca/supp_info/mp_calendar.html

57th Street Art Fair - First weekend in June. 57th Street & Kimbark Avenue: 57thstreetartfair.org

Old Town Art Fair - Mid June. 1800 block of Orleans Street and Lincoln Park West and adjacent Menomonee, North Park and Wisconsin Streets: oldtowntriangle.com

Chicago Blues Festival – Typically held the 2nd weekend in June in Grant Park - Petrillo Music Shell. World famous blues sounds of "Sweet Home Chicago" as well as showcasing talent from coast to coast. Call the Mayor's Office of Special Events for more information, 312-744-3315 or visit: chicagofestivals.net/music/blues-2/blues

The Japan Festival - A month-long series of unique Japanese cultural and educational events, including contemporary theater and film, concerts and exhibits. Visit: japanfest-chicago.org

Chicago Gospel Festival - At Millennium Park in June. World's largest free outdoor gospel festival. Call the Mayor's Office of Special Events for more information, 312-744-3315 or visit: www.choosechicago.com/things-to-do/chicago-events/chicago-gospel-music-festival

Printer's Row Book Fair- On South Dearborn from Congress to Polk, in June. Old, new, rare, antique and special books are for sale by booksellers in historic Printer's Row. Food vendors from Burnham Park's restaurants. Sponsored by the Chicago Tribune, 312-222-3986 or visit: chicagotribune.com/entertainment/books/printersrowlitfest

Grant Park Concerts – June through August at Petrillo Music Shell. America's largest free Symphonic Music Festival featuring international soloists and conductors with the Grant Park Symphony Orchestra and Chorus. Call Grant Park Music Festival Offices for more info, 312-742-7638 or visit: grantparkmusicfestival.com

Taste of Chicago - Held the last week of June and first week of July in Grant Park. Over 75 restaurants participate; there are nightly concerts at Petrillo Music Shell and live broadcasts from major radio stations. Call the Mayor's Office of Special Events for more information, 312-744-3315 or visit: cityofchicago.org/city/en/depts/dca/supp_info/taste_of_chicago.html

Air and Water Show - Spectacular entertainment in the air and on the water at the North Avenue Beach in August. Sponsored by the Chicago Park District, 312-294-2200 or visit: cityofchicago.org/city/en/depts/dca/supp_info/chicago_air_and_watershow.html

Buckingham Fountain - The fountain runs from 8am to 11pm daily, typically from April to mid-October, depending on the weather. Every hour on the hour for 20 minutes the fountain produces a major water display. The center jet shoots 150feet in the air. At dusk, lights and music are added to the display. Located on Congress and Lake Shore Drive. History and fact can be found at: chicagoparkdistrict.com/parks/clarence-f-buckingham-memorial-fountain

Chicago Jazz Festival - Labor Day weekend in Grant Park. This event highlights Chicago's rich jazz tradition. Sponsored by the Mayor's Office of Special Events: cityofchicago.org/city/en/depts/dca/supp_info/chicago_jazz_festival.html

Oktoberfest - Usually late in September on Lincoln Avenue. Bands from Heidelberg and Chicago entertain daily; traditional German food and beer is served under giant tents. Information is posted at: chicagoevents.com/event.cfm?eid=222

Chicago International Film Festival - The end of October at various Chicago theaters. This event features films from 40 countries. Online at chicagofilmfestival.com

Other Chicago Event and Location information: choosechicago.com

City Pass - Chicago CityPASS is a booklet of admission tickets to Chicago's 5 must-see attractions at 50% off the combined admission price: citypass.com/chicago/things-to-do-chicago

APPENDIX

2020 Cancer Biology Prelim Guidelines

The goal of the 2020 prelim exam is to test the ability of the student to critically analyze published science, be familiar with the background and think on their feet in response to questions posed.

The guidelines for the 2020 format are as follows:

1. A preliminary exam committee of three faculty members from CCB, led by a Chair, will choose a recently published primary research paper that will be the focus of the exam for each student.
2. Two weeks prior to the prelim exam, each student will be emailed their assigned paper to read and consider ahead of the exam. Each student in the class will receive different papers.
3. Two days before the scheduled exam, each student should email Laura Negrete a one-page single-space PDF, with half-inch margins, Arial 11 font, which provides a concise summary of their assigned paper followed by a bulleted list of major strengths and weaknesses that will be discussed in the presentation. This summary will be forwarded to the exam committee.
4. The exam will last no more than 2 hours and conclude with a short private session among the exam committee who will determine whether the student receives an unconditional pass, conditional pass (requiring additional coursework to address a gap) or fail (requiring a repeat exam).
5. The format is a slide presentation over Zoom. The student should prepare a set of slides in Powerpoint or Keynote, using Arial or similar font, 20 point or larger, no slide backgrounds, no animations other than appear and disappear, and with all diagrams, models and graphics prepared by the student. When diagrams in reviews are used as models, they must be credited. Only primary data can be drawn from the literature, which must be presented at full resolution.
6. The exam will be in the format of a journal club presentation. The student will present key findings from the literature that serve as background to the paper, define the questions being posed and the models or hypotheses to be tested, explain the logic and materials/methods of the experiments that were performed, describe the results obtained and their statistical analysis, referring to the main and supplementary figures and tables as appropriate, and describe the authors' interpretation of their findings.
7. As a key element, the student should provide critical analysis throughout the presentation, highlighting strengths and limitations of each aspect of the work. Pointing to apparent conflicts with other literature, whether preceding or following, is important. Where a weakness or inconsistency is identified, the student should suggest alternative experiments or other strategies to enhance the rigor of the study.
8. Serving in the role of a reviewer, the student should also propose next steps, including follow-up experiments that could reinforce the studies, resolve an inconsistency with other literature, or make the study more complete.
9. At any point in the exam, faculty may interrupt to ask questions. These may be directly linked to the paper, related literature or off-topic, but designed to test the student's knowledge base in cancer biology, their preparation for the exam and/or their ability to think on their feet. The Chair will ensure that discussions do not drift too far off course.

10. Along with fully understanding the assigned paper and related literature and preparing a slide deck with the planned and backup slides (including all the figures, for example), advance preparation by students should include reviewing topics covered in coursework, CCB seminars and recent important advances in cancer biology.
11. Students are welcome to practice with other students, post-docs or faculty but should not approach members of their committee prior to the exam.

Divisional policy requirements for admission to candidacy to the Ph.D. and for the Ph.D. degree 5.2020

1. Admission to candidacy for the degree of Ph.D. requires:
 - a) Completion of Divisional Course requirements (a minimum of five formal courses).
 - b) A “B” average (GPA =3.0) to be maintained.
 - c) Submission of a written thesis proposal and its defense to the satisfaction of the candidate’s thesis committee (note in some programs this defense also has a public component).
2. Admission to candidacy must occur, or be scheduled to occur, before the end of the student’s **ninth** quarter in residency (typically Autumn Quarter of the 3rd year).
3. If admission to candidacy has not occurred by the end of the student’s ninth quarter then he/she will be unable to register at the beginning of the tenth quarter unless OGPA has approved a detailed plan from the program, student, and thesis advisor in which:
 - a) The program adequately explains why candidacy has not yet been achieved.
 - b) The student lays out a detailed plan for completion of the thesis proposal, with a timeline that does not extend beyond the end of their **eleventh** quarter in residency
 - c) The thesis advisor provides a detailed plan, which includes frequency and nature of mentoring meetings, to assist the student in satisfactorily completing and defending the thesis proposal
4. Completion of the Ph.D. degree additionally requires:
 - a) Completion of Divisional TA-ship requirements
 - b) Completion of Divisional Ethics training requirements
 - c) Completion of all graduate program-specific requirements.
 - d) Submission and oral defense, to the satisfaction of the student’s thesis committee and graduate program, of an original dissertation

BSD divisional course requirements 5.2020

Students must complete a minimum of five formal courses for a letter grade in order to be admitted to candidacy for the Ph.D.

Admittance to candidacy typically requires that a “B” average (GPA =3.0) be maintained (note that graduate classes allow +/- grades). See the “Recommendation to dismiss” policy for additional guidance.

A “B-“ average (GPA 2.75) is sufficient for a terminal Master’s degree.

Graduate programs may require course work over and above the divisional minimum.

Non-traditional courses, such as half-credit bearing micro courses, may count towards divisional and programmatic requirements at the discretion of the graduate program.

Laboratory rotations and research experiences are to be graded P/F and do not count towards the minimum course requirements.

Students must also meet Divisional TA training and Ethics training requirements; these courses are taken P/F and do not count towards the minimum course requirements.

Combined degree students in the graduate phase of their program must follow the same policies as the other PhD students.

Divisional policy on requirements for award of a terminal Master's degree 5.2020

1. BSD graduate programs may award terminal Master's degrees to students who are leaving the Ph.D. program and no longer intend to pursue the degree of Ph.D. within the BSD.
2. To be awarded a Master's degree the student must complete a minimum of five graded courses. A minimum GPA of 2.75 is required.
3. Students in those programs that give a Preliminary Examination must pass this examination at Master's level or above as assessed by their examining committee.
4. The student must satisfy a research or scholarship requirement as determined by their program. Appropriate ways to satisfy this requirement include, but are not limited to, producing a research article or scholarly review to the satisfaction of the program.