

CANCER BIOLOGY, M.S.

The graduate program in cancer biology offers a course of study and research leading to the Ph.D. degree. Although a master's degree is offered under special circumstances, students are not admitted for a master's degree.

The Cancer Biology Graduate Program was established at the McArdle Laboratory for Cancer Research in 1940 as the first graduate program in the United States to offer a degree in basic cancer research. The program now includes more than 50 faculty trainers from multiple departments including Oncology, Medicine, Human Oncology, Cell and Regenerative Biology, Medical Microbiology and Immunology, and others. This interdepartmental structure offers students remarkably diverse training opportunities that span the entire breadth of cancer biology research from haploid or diploid genetics, viral and chemical carcinogenesis, eukaryotic cell and molecular biology, virology, molecular toxicology, and whole-animal carcinogenesis. Through the graduate curriculum, students are introduced to the body of knowledge that has been derived directly from experiments on the induction, properties, and therapy of cancer, and receive the necessary background to conduct independent research.

Curriculum requirements are designed to be flexible, providing a maximal opportunity for specialization within this multidisciplinary field. Students learn through core and elective courses; by participation in seminars, conferences, and journal clubs related to their specific areas of expertise; and most important, from their research advisors. Students who join the program select research advisors after conducting a minimum of three monthlong rotations in different laboratories during the first semester. After choosing an advisor, students will also create an advisory committee of five faculty members who will provide guidance throughout the process of earning the Ph.D. degree. The average time to complete the Ph.D. is 5.5 years. The program prepares students for careers in teaching and research in academia, government, and industry.

ADMISSIONS

This master's program is offered for work leading to the Ph.D. Students may not apply directly for the master's, and should instead see the admissions information for the Ph.D. (<http://guide.wisc.edu/graduate/oncology/cancer-biology-phd/>)

FUNDING

GRADUATE SCHOOL RESOURCES

Resources to help you afford graduate study might include assistantships, fellowships, traineeships, and financial aid. Further funding information (<https://grad.wisc.edu/funding/>) is available from the Graduate School. Be sure to check with your program for individual policies and restrictions related to funding.

REQUIREMENTS

MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum academic progress and degree requirements (<http://guide.wisc.edu/graduate/#policiesandrequirements>), in addition to the program requirements listed below.

MAJOR REQUIREMENTS

MODE OF INSTRUCTION

Face to Face	Evening/ Weekend	Online	Hybrid	Accelerated
Yes	No	No	No	No

Mode of Instruction Definitions

Evening/Weekend: These programs are offered in an evening and/or weekend format to accommodate working schedules. Enjoy the advantages of on-campus courses and personal connections, while keeping your day job. For more information about the meeting schedule of a specific program, contact the program.

Online: These programs are offered primarily online. Many available online programs can be completed almost entirely online with all online programs offering at least 50 percent or more of the program work online. Some online programs have an on-campus component that is often designed to accommodate working schedules. Take advantage of the convenience of online learning while participating in a rich, interactive learning environment. For more information about the online nature of a specific program, contact the program.

Hybrid: These programs have innovative curricula that combine on-campus and online formats. Most hybrid programs are completed on-campus with a partial or completely online semester. For more information about the hybrid schedule of a specific program, contact the program.

Accelerated: These on-campus programs are offered in an accelerated format that allows you to complete your program in a condensed time-frame. Enjoy the advantages of on-campus courses with minimal disruption to your career. For more information about the accelerated nature of a specific program, contact the program.

CURRICULAR REQUIREMENTS

Requirements Detail	
Minimum Credit Requirement	30 credits
Minimum Residence Credit Requirement	16 credits
Minimum Graduate Coursework Requirement	Half of degree coursework (15 credits out of 30 total credits) must be completed graduate-level coursework; courses with the Graduate Level Coursework attribute are identified and searchable in the university's Course Guide (https://registrar.wisc.edu/course-guide (https://registrar.wisc.edu/course-guide/)).
Overall Graduate GPA Requirement	3.00 GPA required.

Other Grade Requirements Students must earn a B or above in the following courses, otherwise the course must be repeated: ONCOLOGY 703 Carcinogenesis and Tumor Cell Biology, ONCOLOGY 715 Ethics in Science, ONCOLOGY 725 Readings in Cancer Biology, and ONCOLOGY 735 Current Problems in Cancer Biology.

Assessments and Examinations	Thesis track—requires a formal thesis. Non-thesis track—no formal examination required.
Language Requirements	No language requirements.

REQUIRED COURSES

The curriculum for Cancer Biology is designed to introduce you to research related to the induction, properties, and therapy of cancer and to ensure that you have the necessary background in one or more areas of related, fundamental science to enable you to do original research. Courses are drawn from the Department of Oncology as well as various related departments, including Bacteriology, Biochemistry, Biomolecular Chemistry, Chemistry, Genetics, Human Oncology, Medical Microbiology and Immunology, Pathology and Laboratory Medicine, and Pharmacology.

The Graduate School at UW-Madison requires PhD students to complete a minimum of 51 credits in order to obtain a PhD Degree. These credits are fulfilled via core curriculum courses, 990 research, and electives. Courses numbered below 300, audit, and pass/fail do not satisfy the minimum requirement. It is suggested that you take approximately 2 courses per semester with the remaining credits being 990 research. All courses must be completed by the end of your second year, before completing the Preliminary Exam.

Code	Title	Credits
Required Courses:		
ONCOLOGY/ PL PATH 640	General Virology-Multiplication of Viruses	3
ONCOLOGY 703	Carcinogenesis and Tumor Cell Biology	3
ONCOLOGY 715	Ethics in Science	1
ONCOLOGY 735	Current Problems in Cancer Biology	2
ONCOLOGY 901	Seminar (presentation) ¹	1
ONCOLOGY 990	Research	1-12
<i>Quantitative Requirement</i>		
B M I/STAT 541	Introduction to Biostatistics	3
	or ONCOLOGY 778 Bioinformatics for Biologists	
Electives (two courses) ²		

¹ Beginning in your second year, you will be required to give an annual, formal presentation in the Cancer Biology Student/Postdoc Seminar Series. You will register for ONCOLOGY 901 Seminar during the semester in which you present. Your seminars will be recorded and you will receive feedback from the seminar course instructor to help improve your public speaking and presentation skills. **Attendance at this seminar series is required.** The schedule is posted on the McArdle website (<https://mcardle.wisc.edu/news-events/cancer-biology-studentpostdoc-seminar-series/>). In addition, you are expected to attend the Cancer Biology Seminar throughout your graduate career (no registration required). The Cancer Biology Seminar, which features local and outside faculty speakers, is held on Wednesdays at 10:30 a.m. in 1345

HSLC. The schedule is posted on the McArdle website (http://www.mcardle.wisc.edu/events/cancerbiology_seminar.htm).

² Students may selective electives from the list below in consultation with their advisor.

Elective Coursework

Code	Title	Credits
BIOCHEM 601	Protein and Enzyme Structure and Function	2
BIOCHEM/ GENETICS/ MICROBIO 612	Prokaryotic Molecular Biology	3
BIOCHEM/PHMCOL- M/ZOOLOGY 630	Cellular Signal Transduction Mechanisms	3
PATH-BIO/ M M & I 528	Immunology	3
MICROBIO 607	Advanced Microbial Genetics	3
M M & I 740	Mechanisms of Microbial Pathogenesis	3
PATH 803	Pathogenesis of Major Human Diseases	3
BIOCHEM/ GENETICS/ MD GENET 620	Eukaryotic Molecular Biology	3
BIOCHEM 625	Mechanisms of Action of Vitamins and Minerals	2
CRB 640	Fundamentals of Stem Cell and Regenerative Biology	3
CRB 650	Molecular and Cellular Organogenesis	3
CRB/MEDICINE 701	Cell Signaling and Human Disease	1
CBE/B M E 520	Stem Cell Bioengineering	3
CBE/B M E 783	Design of Biological Molecules	3
PATH 750	Cellular and Molecular Biology/ Pathology	2-3
M M & I/PATH- BIO 750	Host-Parasite Relationships in Vertebrate Viral Disease	3

POLICIES

GRADUATE SCHOOL POLICIES

The Graduate School's Academic Policies and Procedures (<https://grad.wisc.edu/acadpolicy/>) provide essential information regarding general university policies. Program authority to set degree policies beyond the minimum required by the Graduate School lies with the degree program faculty. Policies set by the academic degree program can be found below.

MAJOR-SPECIFIC POLICIES

PRIOR COURSEWORK

Graduate Work from Other Institutions

With program approval, students are allowed to count no more than 9 credits of graduate coursework from other institutions. Coursework earned five or more years prior to admission to a master's degree or doctoral degree is not allowed to satisfy requirements.

UW–Madison Undergraduate

With program approval, students are allowed to count no more than 7 credits numbered 300 or above from a UW–Madison undergraduate degree.

UW–Madison University Special

With program approval, students are allowed to count no more than 15 credits of coursework numbered 300 or above taken as a UW–Madison special student. Coursework earned ten or more years prior to admission to a doctoral degree is not allowed to satisfy requirements.

PROBATION

A semester GPA below 3.0 or an incomplete grade (I) will result in the student being placed on academic probation. If a semester GPA of 3.0 is not attained or the Incomplete grade is not cleared during the subsequent semester of full-time enrollment, the student may be dismissed from the program or allowed to continue for 1 additional semester based on advisor appeal to the Graduate School.

ADVISOR / COMMITTEE

All students are required to have an advisor. Students must create a certification committee (advisor plus four additional faculty members) by the end of their first year. After passing their preliminary examination, students are required to conduct a progress report meeting with their certification committee each year. Failure to do so may result in a hold being placed on the student's registration.

CREDITS PER TERM ALLOWED

15 credits

TIME CONSTRAINTS

All doctoral students must pass their preliminary examination by the end of their second year (August 31). Under special circumstances, a one-semester extension may be granted when justified in writing by the student and advisor.

A candidate for a doctoral degree who fails to take the final oral examination and deposit the dissertation within five years after passing the preliminary examination may be required to take another preliminary examination and to be admitted to candidacy a second time.

Doctoral degree students who have been absent for ten or more consecutive years lose all credits that they have earned before their absence. Individual programs may count the coursework students completed prior to their absence for meeting program requirements; that coursework may not count toward Graduate School credit requirements.

GRIEVANCES AND APPEALS

These resources may be helpful in addressing your concerns:

- Bias or Hate Reporting (<https://doso.students.wisc.edu/bias-or-hate-reporting/>)
- Graduate Assistantship Policies and Procedures (<https://hr.wisc.edu/policies/gapp/#grievance-procedure>)
- Hostile and Intimidating Behavior Policies and Procedures (<https://hr.wisc.edu/hib/>)
 - Office of the Provost for Faculty and Staff Affairs (<https://facstaff.provost.wisc.edu/>)
- Dean of Students Office (<https://doso.students.wisc.edu/>) (for all students to seek grievance assistance and support)
- Employee Assistance (<http://www.eao.wisc.edu/>) (for personal counseling and workplace consultation around communication and

conflict involving graduate assistants and other employees, post-doctoral students, faculty and staff)

- Employee Disability Resource Office (<https://employee disabilities.wisc.edu/>) (for qualified employees or applicants with disabilities to have equal employment opportunities)
- Graduate School (<https://grad.wisc.edu/>) (for informal advice at any level of review and for official appeals of program/departmental or school/college grievance decisions)
- Office of Compliance (<https://compliance.wisc.edu/>) (for class harassment and discrimination, including sexual harassment and sexual violence)
- Office of Student Conduct and Community Standards (<https://conduct.students.wisc.edu/>) (for conflicts involving students)
- Ombuds Office for Faculty and Staff (<http://www.ombuds.wisc.edu/>) (for employed graduate students and post-docs, as well as faculty and staff)
- Title IX (<https://compliance.wisc.edu/titleix/>) (for concerns about discrimination)

Students should contact the program director with questions about grievances.

OTHER

- Bachelor's degree from an accredited U.S. institution, or comparable degree from an international institution, with a major in biology, biochemistry, chemistry, molecular biology, or related area
- Undergraduate GPA of at least 3.0 on the equivalent of the last 60 credit hours OR a master's degree with a minimum cumulative GPA of 3.0
- Basic course background in chemistry, microbiology, biochemistry, genetics, physiology, and molecular biology recommended
- Prior laboratory research

PROFESSIONAL DEVELOPMENT

GRADUATE SCHOOL RESOURCES

Take advantage of the Graduate School's professional development resources (<https://grad.wisc.edu/pd/>) to build skills, thrive academically, and launch your career.

LEARNING OUTCOMES

1. Articulates, critiques, or elaborates the theories, research methods, and approaches to inquiry or schools of practice in the field of study.
2. Identifies sources and assembles evidence pertaining to questions or challenges in the field of study.
3. Demonstrates understanding of the primary field of study in a historical, social, or global context.
4. Selects and/or utilizes the most appropriate methodologies and practices.
5. Evaluates or synthesizes information pertaining to questions or challenges in the field of study.
6. Communicates clearly in ways appropriate to the field of study.

7. Recognizes and applies principles of ethical and professional conduct.

PEOPLE

Faculty: Alarid (co-director), Loeb (co-director), Ahlquist, Alexander, Arendt, Asimakopoulos, Audhya, Beebe, Bradfield, Bresnick, Burkard, Cryns, Deming, Drinkwater, Evans, Friedl, Friesen, Gould, Griep, Halberg, Harari, Hoffman, Huttenlocher, Jarrard, Johannsen, Kalejta, Kenney, Kimple, Kreeger, Lambert, Lang, Lewis, Marker, McNeel, Mertz, Miyamoto, Morris, Mosher, Rapraeger, Ricke, Rui, Shuler, Sherer, Shull, Striker, Sugden, Tibbetts, Weaver, Wheeler, Xing, Xu, and Zhang. For the most current list of faculty and descriptions of their research interests, the program website (<https://cancerbiology.wisc.edu/faculty-trainers/>).