

DOCTOR OF PHILOSOPHY (PH.D.)

IMPORTANT Note About the Doctor of Philosophy in Cellular and Structural Biology Degree

This program is no longer accepting students at this time as this field of study is now a discipline within the new Integrated Biomedical Sciences (IBMS) (http://gsbs.uthscsa.edu/graduate_programs/integrated-biomedical-sciences) **Program. All information in this section of the Catalog is for the current Cellular and Structural Biology students only.**

The graduate program in Cellular and Structural Biology provides a rewarding opportunity for students wishing to pursue a Ph.D. degree for preparation for a fulfilling career in biomedicine.

The strength of our program is its diversity; faculty are performing state-of-the-art research in areas of animal models of human disease, cancer biology, stem cell biology, development and reproduction, molecular basis of aging, molecular genetics as well as neurobiology and endocrinology. The curriculum and research experience is aimed at producing trainees armed with critical thinking skills, competent in contemporary techniques and with broad scholarly background to become independent investigators, capable of designing and executing programs of excellence in research and teaching. All graduate students pursue a program of study designed to develop both their scholarly and laboratory aptitudes through one-on-one mentoring by members of the graduate faculty. In addition, in-depth instruction is also provided on effective seminar presentation as well as grant and manuscript preparation.

Cellular and Structural Biology Degree Requirements

A minimum of 72 credit hours and a minimum overall GPA of 3.0 is required for the Ph.D. degree. In addition, all doctoral candidates must register for the CSBL 7099 Dissertation for at least two semesters in order to graduate. The student is required to demonstrate intellectual command of the subject area of the graduate program and capability to carry out independent and original investigation in the area. The student must successfully defend a dissertation and be recommended by their program Committee on Graduate Studies (COGS) for approval of their degree to the Dean of the Graduate School of Biomedical Sciences.

Biology of Aging Track- Plan of Study

First Year

Fall		Credit Hours
IBMS 5000	Fundamentals Of Biomedical Sciences	8
CSAT 6097	Research	1-12
INTD 5082	Responsible Conduct of Research	1.5
Total Credit Hours:		10.5-21.5

First Year

Spring		Credit Hours
CSAT 5089	Graduate Colloquium	2
CSAT 5095	Experimental Design And Data Analysis	3
CSAT 6097	Research	1-12
CSAT 6049	Cellular and Molecular Mechanisms of Aging	2

CSAT 6050	Aging and Longevity Mechanisms	2
Total Credit Hours:		10.0-21.0

Second Year

Fall		Credit Hours
CSAT 5077	Scientific Writing	2
CSAT 6090	Seminar	1-9
CSAT 6097	Research	1-12
Total Credit Hours:		4.0-23.0

Second Year

Spring		Credit Hours
CSAT 6090	Seminar	1-9
CSAT 6097	Research	1-12
Total Credit Hours:		2.0-21.0

Third Year

Fall		Credit Hours
CSAT 6090	Seminar	1-9
CSAT 6097	Research	1-12
CSAT 6071	Supervised Teaching	1-12
Total Credit Hours:		3.0-33.0

Third Year

Spring		Credit Hours
CSAT 6090	Seminar	1-9
CSAT 6097	Research	1-12
Elective		3
Total Credit Hours:		5.0-24.0

Fourth Year

Fall		Credit Hours
CSAT 6090	Seminar	1-9
CSAT 7099	Dissertation	0.5-12
Total Credit Hours:		1.5-21.0

Fourth Year

Spring		Credit Hours
CSAT 6090	Seminar	1-9
CSAT 7099	Dissertation	0.5-12
Total Credit Hours:		1.5-21.0

Fifth Year

Fall		Credit Hours
CSAT 6090	Seminar	1-9
CSAT 7099	Dissertation	0.5-12
Total Credit Hours:		1.5-21.0

Fifth Year		Credit Hours
Spring		
CSAT 6090	Seminar	1-9
CSAT 7099	Dissertation	0.5-12
Total Credit Hours:		1.5-21.0

All students admitted to PhD Candidacy no longer register for CSAT 6097 Research. They will register for CSAT 7099 Dissertation.

CSAT 6049 (2 SCH) & CSAT 6050 (2 SCH) together constitute the Biology of Aging core courses that is mandatory for all Biology of Aging students.

Biology of Aging students do not register for each individually. Rather, students take CSAT 6048 (4SCH), which is a combination of both CSAT 6049 and CSAT 6050. However, students in other tracks can take either or both of the 2 courses as electives in the same semester or in separate semesters.

Cancer Biology Track- Plan of Study

First Year		Credit Hours
Fall		
IBMS 5000	Fundamentals Of Biomedical Sciences	8
INTD 5082	Responsible Conduct of Research	1.5
CSAT 6097	Research	1-12
Total Credit Hours:		10.5-21.5

First Year		Credit Hours
Spring		
CSAT 6068	Cancer Biology Core 1; An Introductory course	1
CSAT 6069	Cancer Biology Core 2; Advanced Cancer Biology	2.5
CSAT 5089	Graduate Colloquium	2
CSAT 6097	Research	1-12
CSAT 5095	Experimental Design And Data Analysis	3
Total Credit Hours:		9.5-20.5

Second Year		Credit Hours
Fall		
CSAT 5077	Scientific Writing	2
CSAT 6097	Research	1-12
CSAT 6090	Seminar	1-9
Total Credit Hours:		4.0-23.0

Second Year		Credit Hours
Spring		
CSAT 6090	Seminar	1-9
CSAT 6097	Research	1-12
Total Credit Hours:		2.0-21.0

Third Year		Credit Hours
Fall		
Elective(s) see department		3
CSAT 6097	Research	1-12
CSAT 6090	Seminar	1-9
Total Credit Hours:		5.0-24.0

Third Year		Credit Hours
Spring		
Elective(s) see department		3
CSAT 6097	Research	1-12
CSAT 6090	Seminar	1-9
Total Credit Hours:		5.0-24.0

Fourth Year		Credit Hours
Fall		
CSAT 7099	Dissertation	0.5-12
CSAT 6090	Seminar	1-9
Total Credit Hours:		1.5-21.0

Fourth Year		Credit Hours
Spring		
Elective(s) see department		3
CSAT 6090	Seminar	1-9
CSAT 7099	Dissertation	0.5-12
Total Credit Hours:		4.5-24.0

Fifth Year		Credit Hours
Fall		
CSAT 7099	Dissertation	0.5-12
CSAT 6090	Seminar	1-9
Total Credit Hours:		1.5-21.0

Fifth Year		Credit Hours
Spring		
CSAT 7099	Dissertation	0.5-12
CSAT 6090	Seminar	1-9
Total Credit Hours:		1.5-21.0

All students admitted to PhD Candidacy no longer register for CSAT 6097 Research. They will register for CSAT 7099 Dissertation.

CSAT 6068 (2 SCH) & CSAT 6069 (2 SCH) together constitute the Cancer Biology core course that is mandatory for all Cancer Biology students.

However, students in other tracks can take either or both of the 2 courses as electives in the same semester or in separate semesters.

Cellular and Molecular Medicine Track - Plan of Study ¹

First Year		
Fall		Credit Hours
IBMS 5000	Fundamentals Of Biomedical Sciences	8
INTD 5082	Responsible Conduct of Research	1.5
CSAT 6097	Research	1-12
Total Credit Hours:		10.5-21.5

First Year		
Spring		Credit Hours
CSAT 5089	Graduate Colloquium	2
CSAT 6097	Research	1-12
CSAT 5095	Experimental Design And Data Analysis	3
INTD 6007	Advanced Cell Biology	2
INTD 6009	Advanced Molecular Biology	2
Total Credit Hours:		10.0-21.0

Second Year		
Fall		Credit Hours
CSAT 5077	Scientific Writing	2
INTD 6008	Mitochondria & Apoptosis	1
CSAT 6090	Seminar	1-9
CSAT 5007	Methods In Cell Biology	1
CSAT 5083	Practical Optical Microscopy	1
CSAT 6097	Research	1-12
Total Credit Hours:		7.0-26.0

Second Year		
Spring		Credit Hours
CSAT 6090	Seminar	1-9
CSAT 6097	Research	1-12
Total Credit Hours:		2.0-21.0

Third Year		
Fall		Credit Hours
CSAT 6090	Seminar	1-9
CSAT 6097	Research	1-12
CSAT 6071	Supervised Teaching	1-12
Total Credit Hours:		3.0-33.0

Third Year		
Spring		Credit Hours
CSAT 6090	Seminar	1-9
CSAT 6097	Research	1-12
Total Credit Hours:		2.0-21.0

Fourth Year		
Fall		Credit Hours
CSAT 6090	Seminar	1-9
CSAT 7099	Dissertation	0.5-12
Total Credit Hours:		1.5-21.0

Fourth Year		
Spring		Credit Hours
CSAT 6090	Seminar	1-9
CSAT 7099	Dissertation	0.5-12
Total Credit Hours:		1.5-21.0

Fifth Year		
Fall		Credit Hours
CSAT 6090	Seminar	1-9
CSAT 7099	Dissertation	0.5-12
Total Credit Hours:		1.5-21.0

Fifth Year		
Spring		Credit Hours
CSAT 7099	Dissertation	0.5-12
CSAT 6090	Seminar	1-9
Total Credit Hours:		1.5-21.0

¹ Students can tailor the required coursework for the CMM track to their specific interests including aging, cancer, immunology, neuroscience, metabolism and genetic disorders. They have two options to fulfill the 4-credit advanced course requirement:

Option 1: Take the full course (INTD 5007 Advanced Cellular and Molecular Biology), which is a combination of INTD 6009 & INTD 6007.

Option 2: Take only one of the advanced course modules, either INTD 6009 Advanced Molecular Biology (2 credits) or INTD 6007 Advanced Cell Biology (2 credits), then add 2 credit hours of required core coursework from any of the other IMGP tracks (list provided below).

These changes provide CMM students with the greatest flexibility, while emphasizing the importance of molecular and cellular approaches to studying health and disease.

Genomics, Genetics & Development Track - Plan of Study

First Year		
Fall		Credit Hours
IBMS 5000	Fundamentals Of Biomedical Sciences	8
INTD 5082	Responsible Conduct of Research	1.5
CSAT 6097	Research	1-12
Total Credit Hours:		10.5-21.5

First Year			Fourth Year		
Spring		Credit Hours	Spring		Credit Hours
CSAT 5023	Development	1	Elective(s)		3
CSAT 5024	Genomics	1	see		
CSAT 5025	Genetics	1	department		
CSAT 6059	Stem Cells & Regenerative Medicine	1	CSAT 6090	Seminar	1-9
CSAT 5089	Graduate Colloquium	2	CSAT 7099	Dissertation	0.5-12
CSAT 6097	Research	1-12	Total Credit Hours:		4.5-24.0
CSAT 5095	Experimental Design And Data Analysis	3	Fifth Year		
Total Credit Hours:		10.0-21.0	Fall		Credit Hours
Second Year			CSAT 7099	Dissertation	0.5-12
Fall		Credit Hours	CSAT 6090	Seminar	1-9
CSAT 5077	Scientific Writing	2	Total Credit Hours:		1.5-21.0
CSAT 6090	Seminar	1-9	Fifth Year		
CSAT 6097	Research	1-12	Spring		Credit Hours
Total Credit Hours:		4.0-23.0	CSAT 6090	Seminar	1-9
Second Year			CSAT 7099	Dissertation	0.5-12
Spring		Credit Hours	Total Credit Hours:		1.5-21.0
CSAT 6090	Seminar	1-9	All students admitted to PhD Candidacy no longer register for CSAT 6097 Research. They will register for CSAT 7099 Dissertation.		
CSAT 6097	Research	1-12	CSAT 5023 (1 SCH), CSAT 5024 (1 SCH), CSAT 5025 (1 SCH) and CSAT 6059 (1 SCH) together constitute the Genomics, Genetics & Development Track core course that is mandatory for all Genomics, Genetics & Development students. Genomics, Genetics & Development students do not register for each individually. Rather, students take CSAT 6064 (4SCH), which is a combination of CSAT 5023, CSAT 5024, CSAT 5025 and CSAT 6059. However, students in other tracks can take either or both of the 2 courses as electives in the same semester or in separate semesters.		
Total Credit Hours:		2.0-21.0	Cellular and Structural Biology Objectives/Program Outcomes		
Third Year			Students in the CSB graduate program will have the ability to review, interpret and critically evaluate scientific literature related to areas of biomedical science relevant to cellular and molecular biology in general and specifically to their project. Students will be trained to review and interpret original scientific literature through coursework and in their research.		
Fall		Credit Hours	Students in the CSB graduate program will have the ability to conduct original biomedical research. Students in the program will be able to analyze, plan, organize, and conduct high-quality biomedical research under the direction of supervising professors and guidance of research advisory (dissertation/thesis) committees as appropriate.		
Elective(s)		3	Students in the CSB graduate program will have the ability to communicate effectively in written and verbal presentations. Students will learn to effectively communicate ideas in written format via coursework, examinations and their research and to communicate ideas/concepts in verbal presentations during progress report seminars, research advisory committee meetings, oral examinations/defenses, and participation in scientific meetings.		
see					
department					
CSAT 6097	Research	1-12			
CSAT 6090	Seminar	1-9			
Total Credit Hours:		5.0-24.0			
Third Year					
Spring		Credit Hours			
Elective(s)		3			
see					
department					
CSAT 6097	Research	1-12			
CSAT 6090	Seminar	1-9			
Total Credit Hours:		5.0-24.0			
Fourth Year					
Fall		Credit Hours			
CSAT 6071	Supervised Teaching	1-12			
CSAT 7099	Dissertation	0.5-12			
CSAT 6090	Seminar	1-9			
Total Credit Hours:		2.5-33.0			

Students in the CSB graduate program will demonstrate foundational knowledge and expertise in a select area appropriate to the research project. Students will be able to define, explain, and apply key concepts and fundamental principles related to the areas of biomedical science relevant to their track and to their specific research projects.

Students in the CSB graduate program will demonstrate fundamental knowledge of ethics in biomedical research. Students will be able to recognize ethical dilemmas and behave in accordance with ethical standards of conduct in the design, implementation, analysis, and dissemination of scientific research.