

CELL BIOLOGY, STEM CELLS & DEVELOPMENT (PHD)

Overview

In the Cell Biology, Stem Cells and Development (CSD) PhD program, our students utilize hypothesis-driven experimental approaches and cutting edge technologies to pursue important questions from basic mechanisms in developmental and cell biology to translational applications of stem cell biology.

CSD students and faculty have common interests in understanding the molecular and cellular mechanisms that underlie development, disease, stem cell biology and regeneration. This common curiosity promotes extensive interaction among labs and creates a fantastic intellectual environment. Our CSD Program is structured to provide training in hypothesis-driven experimental approaches coupled with cutting edge technologies. We foster creativity and independence, enabling students to pursue important questions at the junctures between the fields of cell, developmental, and stem cell biology.

Admission Requirements

To apply for admission applicants must submit the following:

- Online Graduate School application
 - Personal Statement: A roughly one-page personal statement describing the applicant's career goals and purpose for seeking a Cell Biology, Stem Cells & Development PhD
 - Resume: The applicant's current resume or curriculum vitae, including professional work/practice since graduating with a bachelor's degree (or equivalent).
 - Past Work Statement
 - Three recommendations: to be completed by people who know your professional, academic and/or personal achievements or qualities well. As such, references must be from professional contacts, such as employers, supervisors, former faculty, preceptors, or professional colleagues. References from clergy, family members, friends or politicians will not be accepted.
- Application Fee: A nonrefundable application fee of \$50.00 (U.S. dollars) for domestic applicants. Checks or money orders should be made out to the University of Colorado.
- Interview: After the application is complete a telephone or video interview will be arranged with the applicant and around 6 faculty members. This interview will afford the program the opportunity to understand the needs of the applicant and for the candidate to ask questions. The interview process is designed to assess the applicant's knowledge of the profession, communication, and ability to perform in a positive, professional manner when working with others. To be considered for admission, applicants must participate in the interview process.
- Transcripts: Official transcripts from all post-secondary colleges and/or universities should be sent directly to:

University of Colorado Denver Graduate Admissions
Campus Box 163
PO Box 173364
Denver, CO 80217-3364

OR Electronic Transcripts should be sent to: graduateadmissions@ucdenver.edu

International students must meet ALL of the requirements above and those required by International Admissions; additionally, their application fee is \$75 U.S. Dollars.

Degree Requirements

First Year

Course	Title	Hours
Year 1		
Fall		
BMSC 7806	Core I: Foundations in Biomedical Sciences	6
BMSC 7810	Core Topics in Biomedical Science ^{Core} Topics A	1-6
BMSC 7810	Core Topics in Biomedical Science ^{Core} Topics B	1-6
CSDV 7650	Research: CSDV ^{Section 001}	1-5
CSDV 7650	Research: CSDV ^{Section 002}	1-5
PHCL 7650	Research in Pharmacology ^{Verify requirement with program due to Spring 2021 curriculum revision}	1-5
Hours		11-33

Spring

CSDV 7605	Stem Cells and Development: An Integrated Approach ^{Section 001}	3-4
CSDV 7605	Stem Cells and Development: An Integrated Approach	3-4
CSDV 7606	Critical Analysis of Research in CSD	3
Hours		9-11

Summer

CSDV 8990	Doctoral Thesis	1-10
Hours		1-10
Total Hours		21-54

Second Year

Course	Title	Hours
Year 2		
Fall		
CSDV 7000	Cells, Stem Cells, and Development: Advanced Topics Discussion	1
CSDV 7650	Research: CSDV ^{Section 0V1}	1-5
MOLB 7950	Informatics and Statistics for Molecular Biology	4
Hours		6-10
Spring		
CSDV 7650	Research: CSDV ^{Section 0V1}	1-5
CSDV 7000	Cells, Stem Cells, and Development: Advanced Topics Discussion	1
Hours		2-6
Summer		
CSDV 8990	Doctoral Thesis	1-10
Hours		1-10
Total Hours		9-26

Third Year & Beyond

Course	Title	Hours
Year 3		
Fall		
CSDV 7605 or CSDV 8990	Stem Cells and Development: An Integrated Approach (Confirm with Program Administrator) or Doctoral Thesis	3-4
CSDV 7000 or CSDV 7100	Cells, Stem Cells, and Development: Advanced Topics Discussion (Confirm with Program Administrator) or Advanced Writing Workshop	1
Hours		4-5
Spring		
CSDV 7650 or CSDV 8990	Research: CSDV (Confirm with Program Administrator) or Doctoral Thesis	1-5
CSDV 7000 or CSDV 7100	Cells, Stem Cells, and Development: Advanced Topics Discussion (Confirm with Program Administrator) or Advanced Writing Workshop	1
Hours		2-6
Summer		
CSDV 8990	Doctoral Thesis	1-10
Hours		1-10
Total Hours		7-21

Learning Objectives

The PhD program in Cell Biology, Stem Cells and Development trains graduate students to become proficient and successful investigators who are able to:

1. Demonstrate a basic knowledge of central concepts in the biomedical sciences.
2. Understand the current concepts in Cell Biology, Stem Cell Biology and Development.
3. Read and critically evaluate the scientific literature.
4. Formulate hypotheses based on current concepts in the field and design, conduct, and interpret their own research projects.
5. Present research results in peer-reviewed publications and in a dissertation.
6. Communicate research results effectively through oral presentations at scientific seminars, conferences, and other venues.
7. Write a competitive application for research funding.
8. Develop ancillary skills, where necessary, to obtain positions outside of scientific research.

Courses

- BMSC 7806 - Core I: Foundations in Biomedical Sciences (6 Credits)**
Course will focus on the fundamental principles of biomedical sciences. Lectures and recitations/discussions will primarily address the basics of molecular biology, biochemistry, genetics, cell biology and energetic principles. Course is typically limited to biomedical science PhD and BSBT MS students. Previously offered as IDPT 7806
Grading Basis: Letter Grade
Repeatable. Max Credits: 6.
Typically Offered: Fall.
- BMSC 7810 - Core Topics in Biomedical Science (1-6 Credits)**
Sections focus on different core topics in biomedical science, and will address subject areas such as protein structure and function, neurobiology, embryology, stem cell research, and cancer biology. Students can enroll in multiple Core Topic Courses topics in one semester. Previously offered as IDPT 7810.
Grading Basis: Letter Grade
Repeatable. Max Credits: 20.
AMC-PHD PhD Students only
Typically Offered: Fall.
- CSDV 7000 - Cells, Stem Cells, and Development: Advanced Topics Discussion (1 Credit)**
This course is a student-led paper discussion focusing on advanced topics pertaining to cell biology, stem cells, and developmental biology. Students will select, present, and discuss primary articles on diverse topics within these fields. Restriction: Students in the CSD program only, 2nd year and beyond.
Grading Basis: Pass/Fail Only
Repeatable. Max Credits: 6.
A-GRAD Restricted to graduate students only.
Typically Offered: Fall, Spring.
- CSDV 7100 - Advanced Writing Workshop (1 Credit)**
This course is a student-led writing workshop focusing on developing writing skills through submission, editing, and discussion of drafts. Draft types will be chosen by the students enrolled and will include manuscripts, these, and documents related to career development. Students must have completed/passed their comprehensive exam in respective program; priority to CSDV PhD students.
Grading Basis: Pass/Fail with IP
Typically Offered: Fall, Spring.
- CSDV 7605 - Stem Cells and Development: An Integrated Approach (3-4 Credits)**
Integrative introductory course incorporating the related fields of Cell Biology/Developmental Biology/Stem Cells. Through lectures, contemporary literature discussions, student presentations, enrollees will gain a sophisticated understanding of the biological concepts/experimental approaches underlying current understanding of cell, developmental, and stem cell biology. Pre-Requisite: IDPT 7806
Grading Basis: Letter Grade
Repeatable. Max Credits: 4.
A-GRAD Restricted to graduate students only.
Typically Offered: Spring.

CSDV 7606 - Critical Analysis of Research in CSD (3 Credits)

First-year students will learn to critically evaluate scientific literature in preparation for writing and critiquing research grant proposals. Primary literature will focus on cell and developmental biology related to CSDV 7605. Each session concludes with written mini-proposals and peer critiques. For CSDV & BSP first year students. If possible, limit to CSDV-PHD and BMSC-PHD plans. Else: Prerequisite: IDPT 7806 & 7810; Corequisite: CSDV 7605
Grading Basis: Letter Grade
Typically Offered: Spring.

CSDV 7650 - Research: CSDV (1-5 Credits)

Research work in cell biology, stem cells and development. Prereq: Consent of the instructor.
Grading Basis: Letter Grade with IP
Repeatable. Max Credits: 10.
A-GRAD Restricted to graduate students only.
Typically Offered: Fall, Spring, Summer.

CSDV 8990 - Doctoral Thesis (1-10 Credits)

Doctoral Thesis work in Cell biology, Stem Cells and Development. Prereq: Consent of Instructor.
Grading Basis: Letter Grade with IP
A-GRAD Restricted to graduate students only.
Additional Information: Report as Full Time.
Typically Offered: Fall, Spring, Summer.

MOLB 7950 - Informatics and Statistics for Molecular Biology (4 Credits)

This course covers the design and analysis of common molecular biology experiments with thorough coverage of statistical and informatic approaches to data analysis. The course begins with a "boot camp" that covers use of shell programming, R/R Studio, and Python scripting in bioinformatics. Pre-Req: MOLB-PhD or CSDV-PhD students only
Grading Basis: Letter Grade
A-GRAD Restricted to graduate students only.
Typically Offered: Fall.

PHCL 7650 - Research in Pharmacology (1-5 Credits)

Research work in pharmacology. Prereq: Consent of Instructor.
Grading Basis: Letter Grade with IP
Repeatable. Max Credits: 99.
A-GRAD Restricted to graduate students only.
Typically Offered: Fall, Spring, Summer.

Policies

Please refer to the Graduate School Policies page (<http://catalog.ucdenver.edu/cu-anschutz/schools-colleges-programs/graduate-school/#policiestext>).

Contact Us

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