DEVELOPMENTAL AND STEM CELL BIOLOGY (PHD)

Visit program website. (https://dscb.ucsf.edu)

Degree Offered: PhD
Program Leadership:
Todd Nystul, PhD, Co-Director
Julie Sneddon, PhD, Co-Director
Admissions Inquiries:
Meredith Miner, Program Manager

Program Description

The Developmental and Stem Cell Biology PhD program builds upon the outstanding strengths of basic and translational research at UCSF. It provides training in five overlapping and interrelated thematic areas: stem cells and cell differentiation, organogenesis and tissue regeneration, pattern formation and morphogenesis, evolutionary developmental biology and translational efforts using stem cells in disease modeling and drug screening. The DSCB Program offers an integrated and multidisciplinary educational opportunity for graduate students pursuing careers in these rapidly expanding fields.

Faculty

The DSCB program includes faculty members from various clinical and basic science departments with a wide range of interests. Most DSCB faculty have ongoing laboratory projects that span multiple thematic areas.

The DSCB program coordinates its activities with a variety of cross-campus entities including the Eli and Edythe Broad Center of Regeneration Medicine and Stem Cell Research (https://stemcell.ucsf.edu/), the Smith Cardiovascular Research Institute (https://cvri.ucsf.edu/), the Helen Diller Family Comprehensive Cancer Center (https://cancer.ucsf.edu/), the UCSF Diabetes Center (https://diabetes.ucsf.edu/), and the Gladstone Institutes (https://gladstone.org/).

Sub-disciplines

- Stem cells and cell differentiation
- Organogenesis and tissue regeneration
- Pattern formation and morphogenesis
- Evolutionary developmental biology
- Translational stem cell biology

The DSCB program is offered by the UCSF Graduate Division, administered by the UCSF Graduate Medical Education Unit (GMU), and delivered by faculty members in the UCSF schools of dentistry and medicine.

Learning Outcomes

The goal of our predoctoral program is to provide broad-based, interdisciplinary training in developmental biology. Because the field is likely to change as much in the next decade as in the past 40 years, a broad education in diverse subjects with a dynamic curriculum offers the best means to meet future challenges. Students are therefore educated in a range of core disciplines and medically relevant fields including genetics, molecular biology, cell biology, biochemistry, biostatistics, and, especially, developmental biology. They are provided with training in a wide range of techniques and given opportunities to address biological and biomedical questions in a variety of organisms with cutting edge technology in state-of-the-art laboratories. Particular emphasis is placed on learning to think critically, formulate hypotheses, design experiments, write and present clearly, and conduct rigorous research ethically and responsibly. By promoting their intellectual growth and experimental skills, the DSCB program teaches students how to become independent, innovative scientists who are able to recognize important questions to investigate and be equipped to contribute at the highest levels to developmental biology for decades to come.

Additional Information

Program Core Faculty

- *Find a* program faculty list *(*https://dscb.ucsf.edu/faculty/*) on the program website.*

Career Outcomes

- *Find* career outcomes and other data on PhD programs *(*https://graduate.ucsf.edu/program-statistics/#career*) on the Graduate Division website.*

Degree Requirements

- Minimum GPA of 3.0
- All core courses and required activities taken and passed
- Six quarters in residence including a minimum of three quarters (enrolled in 8 units of DEV STMCEL 250 Research in each quarter) after advancement to candidacy
- Pass qualifying examination
- Completion and submission of the dissertation
- For additional details, please see: graduate.ucsf.edu/phd-degree (https://graduate.ucsf.edu/phd-degree/)

Core Courses

Course	Title	Units
Year 1		
Fall Quarter		
GRAD 202	Racism in Science	3
DEV STMCEL 257	Developmental and Stem Cell Biology	4
DEV STMCEL 216	Journal Club [1]	3
DEV STMCEL 215	Laboratory Rotation [2]	3
DEV STMCEL 217	Seminar Series [1]	3
	Units	**16**
Winter Quarter		
GENETICS 200A	Principles of Genetics	3
DEV STMCEL 216	Journal Club [1]	3
DEV STMCEL 215	Laboratory Rotation [2]	3
DEV STMCEL 217	Seminar Series [1]	3
	Units	**12**
Spring Quarter		
GRAD 214	Responsible Conduct of Research and Rigor & Reproducibility	1.5
DEV STMCEL 270	Special Topics in Developmental & Stem Cell Biology [3]	3
DEV STMCEL 216	Journal Club [1]	3
DEV STMCEL 215	Laboratory Rotation [2]	3
DEV STMCEL 217	Seminar Series [1]	3
	Units	**13.5**

Year 2		
Fall Quarter		
DEV STMCEL 216	Journal Club [1]	3
DEV STMCEL 217	Seminar Series [1]	3
	Units	**6**
Winter Quarter		
DEV STMCEL 216	Journal Club [1]	3
DEV STMCEL 217	Seminar Series [1]	3
	Units	**6**
Spring Quarter		
DEV STMCEL 216	Journal Club [1]	3
DEV STMCEL 217	Seminar Series [1]	3
	Units	**6**
	Total Units	**59.5**

[1] 6 quarters required
[2] 3 rotations required
[3] Three instances of this course are required, or students can take other basic science minicourses to fulfill this requirement.

Elective Requirement

Can be fulfilled by taking two minicourses **or** a full-length course.

Approved Electives

Code	Title	Units
BIOENGR 221	Tissue Mechanobiology	2.5-3
BIO MD INF 203	Biocomputing Algorithms	4
BIO MD INF 206	Statistical Methods for Bioinformatics	4
BIOCHEM 241	Startup 101	3
OR CRA FAC 221	Current Concepts in Oral Biology	2.5
Other elective courses may be approved by the program as appropriate.		

Non-course Core Requirements

- Teaching Assistantship – One quarter; 2nd year
- Qualifying Exam – Must take before 8/31 of second year in program.