

Stem Cells in Tissue Morphogenesis and Cancer (2 units)

Fall Quarter, 2023.

Thursdays, 10:30-11:45 AM - Speaker Lecture in Carson Family Auditorium (CRC).

Thursdays, 1:15-3 PM - Class Discussion with Speaker in CRC 406.

Note: All 10:30 AM Seminars will be open to campus faculty, non-registered students and postdocs, space permitting. In cases where large attendance is anticipated, we may move the lecture site to Caspary and/or open the lecture for non-student participants to Zoom.

Reading assignments and PDFs are available on the course website. Assigned reading and speaker biographies can also be downloaded from the graduate student course materials website - <https://www.rockefeller.edu/education-and-training/graduate-program-in-bioscience/curriculum/>.

Course Instructors:

Elaine Fuchs (RRB 1250; fuchs@rockefeller.edu; Admin Asst. Christine Long; clong@rockefeller.edu)

Ali Brivanlou (RRB 743c; brvnlou@rockefeller.edu; Admin Asst. Jean-Marx Santel, jsantel@rockefeller.edu.)

Course Administrator:

Kristen Cullen (Dean's Office, cullenk@rockefeller.edu)

This course aims to present and discuss key concepts in stem cell biology drawing on research from invertebrates to human. We will cover basic principles of stem cells from signaling, chromatin dynamics, self-renewal, asymmetric cell divisions and niche interactions to tissue development, homeostasis, metabolism, aging, wound-repair, inflammation and cancer. In addition to the course instructors' lectures, there will be 8 guest speakers, all of whom are world renowned leaders in the field. Guest speakers for 2023 include Amander Clark, Kat Hajanakis, Paolo Arlotta, Yasmine Belkaid, Sean Morrison, Alejandro Sanchez, Carla Kim and Olivier Pourquier. Although seminars will be open to the campus, they will be geared towards students enrolled in the course. Following each of these lectures, course instructors will lead a discussion with the speaker and class over pre-assigned papers relating to the research topic. Discussion sessions are intended for enrolled students; anyone wishing to attend will need special permission from Elaine/Ali.

Course credit will be awarded based upon participation in lectures and class discussions and a written prospectus on a focused, contemporary stem cell topic that you find interesting (no more than 1,500 words and 1-2 figures). In November, we will provide you with further guidelines.

All registered students are required to attend lectures and class. Each week, two volunteers enrolled for credit in the class will host the guest speaker. Hosting duties include: assisting the speaker with set-up for the seminar, introducing the speaker and leading the Q&A after the seminar. In addition, for those talks that will be in person, (most if not all of them), you will host the speaker for a campus lunch.

List of speakers

Sept 14th. Kat Hajanakis, Memorial Sloan Kettering Institute, hadj@mskcc.org , Transcriptional control of blastocyst development.

Sept 21st. Amander Clark, University of California, Los Angeles, clarka@ucla.edu, Formation and differentiation of human germline cells.

Sept 28th. Ali Brivanlou, Rockefeller University, brvnlou@rockefeller.edu, Early human development.

October 5th. Paola Arlotta, Harvard University, paola_arlotta@harvard.edu, Neuronal regeneration and degeneration in the brain.

October 12th. Elaine Fuchs, Rockefeller University, fuchs@rockefeller.edu, Skin stem cells: making and repairing tissues in homeostasis and injury.

October 19th. Elaine Fuchs, Rockefeller University, fuchs@rockefeller.edu, Stem cells: coping with stress in inflammation and cancer.

October 26th. No class today. Out of town Stem Cell Retreat for Rockefeller University.

Nov 2nd. Yasmine Belkaid, National Institute of Health*, ybelkaid@niaid.nih.gov, The importance of the microbiome and the immune system in stem cell biology and tissue maintenance. *becomes President, Pasteur Institute January 2024.

November 9th. Sean Morrison, University of Texas Southwestern Med School, Sean.Morrison@UTSouthwestern.edu, Hematopoietic stem cells and their niche.

November 16th. Alejandro Sanchez, Scientific Director, The Stowers Institute, asa@stowers.org, The planarial neoblast: mother of pluripotency.

November 23rd. Thanksgiving.

November 30th. Carla Kim, Harvard Stem Cell Institute, carla.kim@childrens.harvard.edu, Lung epithelial stem cells in health and disease.

Dec 7th. Olivier Pourquier, Harvard University, pourquie@genetics.med.harvard.edu, Muscle stem cells and fate decisions in development.

Dec 14th. Ali Brivanlou, The Rockefeller University, brvnlou@rockefeller.edu, Class wrap-up, and prospects of stem cell biology for regenerative medicine.