

Stem Cells in Tissue Morphogenesis and Cancer (2 units)

Fall Quarter, 2019.

Thursdays 10:30-11:30 AM

Carson Family Auditorium (CRC). Guest Seminars (open to faculty, students and postdocs).

Thursdays 1:10-3 PM Weiss 301. Class Lectures by Course Instructors or Discussions with Guest Speakers.

(postdocs, faculty and auditing students will be allowed to attend Speaker Discussion Sessions , but are asked to sit in the back and not actively participate in the discussions). Reading assignments and PDFs will be 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. Adam Souza; asouza@rockefeller.edu)

Course Administrator:

Kristen Cullen (Dean of Students' 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 and cancer. In addition to the basic lectures, there will be 8 guest speakers, all of whom are world renowned leaders in the field. Although the 8 guest lectures will be open to the public, they will be geared towards students enrolled in the course. Following each of these lectures, course instructors will lead a discussion with the guest speaker and class over pre-assigned papers relating to the research topic. Guest lecturers for 2019 include David Scadden, Alejandro Sanchez-Alvarado, Kat Hadjonakis, Sean Morrison, Jim Wells, Carla Kim, Tom Rando and Olivier Pourquie.

Course credit will be awarded based upon participation in lectures and class discussions and a written minireview on a focused contemporary stem cell topic (no more than 3,000 words and 1-2 figures). In November, we will provide you with a list of topics for you to choose from.

All registered students are required to attend lectures and class. Two volunteers enrolled for credit in the class will host each 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, taking the speaker to lunch between the seminar and discussion session, and escorting the speaker to car service after the discussion session is over. Sign-up sheets include spaces for one or in a few cases two additional (enrolled for credit) students who will participate in the student lunch with speakers.

List of speakers

Sept 12th. Ali Brivanlou, Rockefeller University, brvnlou@rockefeller.edu, 1-3pm class lecture/discussion only. Weiss 301. Modeling Early Human Development using self-organizing synthetic human embryos (embryoids).

Sept 19th. Elaine Fuchs, Rockefeller University, fuchs@rockefeller.edu, 1-3pm class lecture/discussion only. Weiss 301. Skin Stem Cells and Their Niches in Development, Homeostasis and Tissue Regeneration.

Sept 26th. Alejandro Sanchez Alvarado, Stowers Institute for Medical Research, asa@stowers.org, 10:30-11:30am, Thursday Lecture, Carson Auditorium. 1-3pm discussion. Weiss 301. Pluripotency Beyond Embryogenesis.

Oct 3rd. Anna-Katerina Hadjantonakis, Memorial Sloan Kettering Cancer, hadj@mskcc.org, 10:30-11:30am, Thursday Lecture, Carson Auditorium. 1-3pm discussion. Weiss 301. Stem Cells and the Early Mammalian Embryo.

Oct 10th. Olivier Pourquie, Harvard Medical School, pourquie@genetics.med.harvard.edu, 10:30-11:30am, Thursday Lecture, Carson Auditorium. 1-3pm discussion. Weiss 301. Making muscle *in vivo* and *in vitro*.

Oct 17th. David Scadden, Harvard Stem Cell Institute, dscadden@mgh.harvard.edu, 10:30-11:30am, Thursday Lecture, Carson Auditorium. 1-3pm discussion. Weiss 301. Title: TBA.

Oct 24th. Carla Kim, Children's Hospital Boston, Harvard Medical School, carla.kim@childrens.harvard.edu, 10:30-11:30am, Thursday Lecture, Carson Auditorium. 1-3pm discussion. Weiss 301. Organoid modeling of lung disease .

Oct 31st. Thomas Rando, Stanford University, rando@stanford.edu, 10:30-11:30am, Thursday Lecture, Carson Auditorium. 1-3pm discussion. Weiss 301. Stem cell quiescence: regenerative potency and stress resistance.

Nov 7th. Elaine Fuchs, Rockefeller University, fuchs@rockefeller.edu, 1-3pm class lecture/discussion only. Weiss 301. Coping With Stress: Skin Stem Cells in Inflammation and Cancer. **Mini-review topics distributed.**

Nov 14th. James Wells, Cincinnati Children's Hospital Medical Center, james.wells@cchmc.org, 10:30-11:30am, Thursday Lecture, Carson Auditorium. 1-3pm discussion. Weiss 301. Using Pluripotent Stem Cell-derived tissues to study human development, digestive diseases and diabetes.

Nov 21st. Sean Morrison, UT Southwestern Medical Center, Sean.Morrison@UTSouthwestern.edu, 10:30-11:30am, Thursday Lecture, Carson Auditorium. 1-3pm discussion. Weiss 301. The hematopoietic stem cell niche.

Dec 5th. Ali Brivanlou, Rockefeller University, brvnlou@rockefeller.edu, 1-3pm class lecture/discussion only. Weiss 301. Modeling Early Human Development using self-organizing human cerebroids and neuruloids.

Dec 12th. Elaine Fuchs and Ali Brivanlou. 1-3PM Pizza lunch, course wrap-up. Weiss 301. **Mini-Review papers due**