

Stem Cells & Regenerative Medicine 2014

Course Organizers

PD Dr. Volker Enzmann volker.enzmann@insel.ch

Location & Time: MEM Building Seminar Room 1 (H 810); Murtenstrasse 35 (16:00 – 17:30 h)

Grading

20% Participation (80% of the lectures)/Discussion
80% Final Exam
ECTS: 2 Points

Course Goals

At the end of this course, students are expected to be able to:

- Understand the basic biology of stem cells and the control of stem cell fate specification and differentiation.
- Describe the differences and similarities of various stem and progenitor cell populations.
- Describe the clinical uses (or potential uses) of stem cells and their derivatives in selected organs.
- Discuss the ethical issues revolving around the use of stem cells.
- Converse in an intermediate level about the current key topics of investigation in the field of stem cells and regenerative medicine.

Course Description

This course will cover a broad range of topics relevant to stem cell biology in reference to regenerative medicine. This fast-moving field brings together many aspects of basic and applied biology and medicine including development, regeneration/repair, and cancer. The course will cover the following concepts and themes: Types of stem cells (including adult, embryonic, germline stem cells, and induced pluripotent stem cells); Stem cell biology relevant to specific organ systems; Stem cells and cancer; Therapeutical approaches using stem cells in regenerative medicine, and Ethics.

Resources

No single textbook is available, as this is a rapidly evolving field. Course instructors will compile a set of useful comprehensive high-quality review articles as well as from selected texts including:

- Regenerative Medicine:
 - o Regenerative Medicine and Cell Therapy (Hossein Baharvand, Nasser Aghdami. 2012)
 - o Principles of Regenerative Medicine 2nd Edition (Anthony Atala, Robert Lanza, James A. Thomson & Robert Nerem. 2010)
- Stem cells:
 - o Stem Cells (Anna Wobus & Kenneth Boheler. 2008)
 - o Essentials of Stem Cell Biology 2nd Edition (Robert Lanza. 2009)

Course Syllabus

Lecture	Date	Instructor	Topic	Duration
1	18.02.2013	V. Enzmann	Course Introduction Historical & Future Perspectives Stem Cells & Ethics	1.5 hrs
2	25.02.2013	V. Enzmann	Stem Cell Types: Embryonic Stem Cells & Adult Stem Cells	1.5 hrs
3	04.03.2013	S. Kleinlogel	Optogenetics	1.5 hrs
4	11.03.2013	D. Grandgirard	Stem Cell Niches	1.5 hrs
5	18.03.2013	H.R. Widmer	Neural Precursor Cells and Regenerative Medicine	1 hr
6	25.03.2013 Lecture Hall Ophthalmology!	S. Leib	Neuronal Stem Cells in Central Nervous System Infection and Regeneration	1 hr
7	01.04.2013	E. Müller	Repair of the hair follicle stem cell niche	1 hr
10	08.04.2013	T. Geiser & A. Gazdhar	Stem Cells of the Lung & Pulmonary Regenerative Medicine	1 hr
9	15.04.2013	D. Stroka	Liver regeneration	1 hr
8	29.04.2013	M. Cecchini	Stem-like cells in prostate cancer metastasis	1 hr
11	06.05.2013	A. Schöberlein	Embryonic stem cells & Placenta-derived Progenitor Cells	1 hr
12	13.05.2013	T. Martin	Targeting tumor initiating cells in lung cancer	1 hr
13	27.05.2013	V. Enzmann	Final Examination	