SISR 618 (4867) Stem cell science

(Code: 4867, 1st~2nd year, 4 units)

(Course ID: GS－c4867－S)

1. Instructors

Name	Department	Contact Information
Associate Professor Nuttawut Sermsathanasawadi, M.D., Ph.D. (**Chief Instrctor**)	Division of Vascular Surgery, Department of Surgery	Nuttawut.ser@mahidol.ac.th

2. Classroom/Lab Lecture

Laboratory Room, SiMR 5th Floor and Laboratory Room Srisavarindhira 10th Floor, Faculty of Medicine Siriraj hospital, Mahidol University

3. Course Purpose and Outline

Comprehensive view of the stem cell biology, the potential uses of stem cell in clinical practices, stem cell biology of both embryonic and adult stem cells including characteristics at cellular and molecular levels, signaling transduction, stem cell interactions with their microenvironment and their role in tissue homeostasis, basic technology involving in stem cell research, hematopoietic stem cell transplantation as a standard treatment for hematological disorders, potential uses and limitations of stem cells for the treatment of diseases other than hematological disorders, ethics in animal care and use for research and ethical issues of stem cell applications

4. Course objectives

By the end of the course, participants will be able to:

1. Scientific principles which underlie stem cell biology and regulation of stem cells and human diseases connected to stem cell biology.
2. Describe various types of stem cells in the human body and their potential applications in regenerative medicine.
3. Understand the clinical, ethical and regulatory aspects of the applications of stem cell therapy.
4. Learn laboratory techniques that could be used in stem cell research.
5. Demonstrate a group working and responsibility for work assigned.
6. Demonstrate effective communication skills for scientific presentation.
7. Identify and critically address a scientific question in regenerative medicine.

5. Format

Lectures, group discussion, report presentation

All programs will be conducted in English.

All class activities will be provided in an online format via Moodle platform

6. Course Details

No.	Topic/Details
1	Introduction to Laboratory
2	Basic Lab Instruments and Equipments
3	Basic Lab Instruments and Equipments
4	Basic Lab Instruments and Equipments
5	Basic Lab Instruments and Equipments
6	Good Lab Practice
7	Blood Perfusion and Laser Doppler
8	Blood Perfusion and Laser Doppler
9	Basic Cell Culture
10	Basic Cell Culture
11	Basic Flow Cytometrty
12	Basic Flow Cytometrty
13	Hand on operation Flow Cytometer
14	QQMNC cultivation
15	Phenotypic and characterization of Cells
16	Apoptosis test by Flowcytometry
17	Colony forming assay
18	Tube formation
19	Insight of Confocal Microscopy
20	IPS Derived EPC
21	IPS Derived EPC
22	IPS Derived EPC
23	IPS Derived EPC
24	Lab Discussion
25	Lab Discussion
26	Lab Discussion

7. Assessment

Scoring

- Direct observation 60%
- Case Presentation 40%

8. Prerequisite Reading

When reading materials are given or specified in advance, participants are expected to study those materials before attending the class.

9. Reference Materials

To be announced before individual classes

10. Language used

All classes are conducted in English.

11. Office Hours

Mon - Fri: 9:00 AM - 17:00 PM

Contact: Associate Professor Dr.Nuttawut Sermsathanasawadi, Division of Vascular Surgery, Department of Surgery

Email: Nuttawut.ser@mahidol.ac.th Tel +662-4198021

Please contact the instructor regarding questions or consultations.

12. Note(s) to Students

None.