

Stem Cell Regulation

(Code : 4861, 1st – 2nd year, 4 units)

(Course ID: GS—c4861—S)

1. Instructors

Name	Position	Department	Contact Information
TAGA Tetsuya	Chief Instructor / Professor	Department of Stem Cell Regulation	taga.scr@mri.tmd.ac.jp
TABU Kouichi	Junior Associate Professor	Department of Stem Cell Regulation	k-tabu.scr@mri.tmd.ac.jp
MUROTA Yoshitaka	Assistant Professor	Department of Stem Cell Regulation	muro.scr@mri.tmd.ac.jp

2. Classroom/Lab Lecture Location

Check the locations announced at the beginning of the academic year.

3. Course Purpose and Outline

The purpose of this course is for students to improve their ability to independently study stem cell regulations and applications through education and training about origins, properties and regulations of stem cells that function in tissue development, maintenance and regeneration. Through this course, students will comprehensively understand stem cells in normal and pathological conditions. The course will especially focus on neural stem cells, hematopoietic stem cells and cancer stem cells in view of cell-external cues from "niches" and cell-intrinsic cues such as epigenetic regulations.

4. Course Objectives

The objectives of this course are as follows: To help students absorb knowledge and research strategies necessary to understand and employ regulatory mechanisms of stem cell development, maintenance and fate determinations, particularly in neural stem cells, hematopoietic stem cells and cancer stem cells. To help students learn molecular biological, cell biological and histological methods for conducting research projects. To develop students' capacity to recognize problems by themselves, construct working hypotheses, design and perform experiments to solve them, properly discuss experimental results and report their research summaries in English.

5. Format

This course is set up for a small number of students to allow for more intense discussion and in-depth participation.

6. Class Detail

In order to understand tissue development and regeneration from biological and clinical viewpoints, it is important to study the molecular regulation of stem cell maintenance and fate specification. We place particular focus not only on normal tissue stem cells (e.g. neural and hematopoietic stem cells) but also on cancer stem cells, which will be discussed to consider the problem of cancer recurrence. We will refer to cell-extrinsic signals like growth factors in the niche and cell-intrinsic cues such as epigenetic modifications as cell fate regulatory elements.

Research Meeting: Every Friday 15:00 – 16:30 PM

Check the schedules announced at the beginning of the academic year for lectures and special lectures.

7. Assessment

An overall assessment comprising of class participation (knowledge and understanding of the specialty field, content of presentations and Q&A) (50%) and involvement in research (50%) will be made.

8. Prerequisite Reading

Students should read advanced literature and papers published in international academic journals on stem cell regulations. They should also possess the necessary skills to run Word, Excel, and PowerPoint, which are used in lectures and practice.

9. Reference Materials

Molecular Biology of the Cell, fifth edition. Garland Science. 2008.

StemBook. Harvard Stem Cell Institute. 2008. (<http://www.ncbi.nlm.nih.gov/books/NBK27044/>)

10. Language Used

All classes are conducted in English.

11. Office Hours

Mon: 11:00 AM – 12:00 PM (make an appointment by e-mail)

Contact: TAGA Tetsuya, Department of Stem Cell Regulation

E-mail address: taga.scr@mri.tmd.ac.jp

Please contact the instructor regarding questions or consultations.

12. Note(s) to Students

Participants are required to study on a voluntary basis.