Course number	U-LAS70 10002 SE50				
Course title (and course title in English)	ILAS Seminar-E2 :Introduction to Stem and iPS Cells（幹細胞とiPS細胞入門） ILAS Seminar-E2 :Introduction to Stem and iPS Cells	**Instructor's name, job title, and department of affiliation**	Graduate School of Medicine Senior Lecturer,Marco,Marques Candeias		
Group	Seminars in Liberal Arts and Sciences	**Number of credits**	2	**Number of weekly time blocks**	1
Class style	seminar (Face-to-face course)	**Year/semesters**	2024・First semester	**Quota (Freshman)**	15 (15)
Target year	Mainly 1st year students	**Eligible students**	For all majors	**Days and periods**	Thu.5
Classroom	04, Yoshida-South Campus Bldg. No. 1			**Language of instruction**	English
Keyword	Stem Cell / iPS Cell / Cancer Stem Cell / Cell Therapy / Disease Modelling				

[Overview and purpose of the course]

How a single egg-cell can give rise to a tridimensional complex system of tissues and organs in the organism. Fundaments of Embryology (from the oocyte until gastrulation/neurulation) and Stem Cell Biology (ES, iPS, CSC) will be introduced. Students will learn from recent research articles (including the original Takahashi & Yamanaka paper) as well as from recent textbooks on Developmental Biology and Stem Cell Research. After learning about the several subjects, the students will present recent research in class and active discussion will be encouraged.

[Course objectives]

The classes will be interactive. Recent exciting research discoveries about iPS cells and cell replacement therapy will be introduced and discussed. The students will learn about stem cells, cell commitment and differentiation, iPS cells, cancer stem cells, disease modeling and personalized cellular therapy.

[Course schedule and contents)]

The following topics will be viewed during a total of 13 classes in the classroom:
. Differential Gene Expression
. Fertilization: Beginning a New Organism
. Early Development in Mammals
. Embryonic Stem Cells
. Differentiation in Early Development
. Generation of Induced Pluripotent Stem (iPS) Cells
. Characteristics and Characterization of Pluripotent Stem Cells
. Cancer Stem Cells
. Neural Stem Cells: Therapeutic Applications in Neurodegenerative Diseases
. Use of Embryonic Stem Cells to Treat Heart Disease
. Insulin-Producing Cells Derived from Stem Cells: A Potential Treatment for Diabetes
. Stem Cells for the Treatment of Muscular Dystropy
. Cell Therapy for Liver Disease
. Skin Regeneration
. Embryonic Stem Cells in Tissue Engineering
. Adult Stem Cells in Tissue Engineering

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. Stem Cell Gene Therapy
. iPS Cells in Disease Modelling and Drug Screening

One class will be in the laboratory to observe first-hand the power of genes on cell identity, including stemness and differentiation.

(Total:14 classes and 1 feedback)

[Course requirements]

None

[Evaluation methods and policy]

Evaluation will be based on active participation (~20 %), assignments (~50 %) and quizzes/test (~30 %).
Those who are absent more than four times will not be credited.

[Textbooks]

Edited by:Robert Lanza and Anthony Atala 『Essentials of Stem Cell Biology (Third Edition)』 （Academic Press） ISBN:9780124095038, 9780124104273（2013）
Scott F. Gilbert 『Developmental Biology 10th』 （Sinauer Associates） ISBN:9780878939787（2013）

[Study outside of class (preparation and review)]

Some time will be necessary weekly to prepare for the class. Handouts will be available in advance to help with the preparation. During the assignment week extra time will be necessary in order to prepare for the presentation in class.

[Other information (office hours, etc.)]

Questions and discussions during class are highly encouraged.
Questions and discussions will also be addressed, happily, any other time, even outside the official office hours.