Course Coding(科目ナンバー)	Year/Semester/Term(年度・学期)	Faculty Offering Course(時間割所属・時間割コード)	Eligible Student Year(開講年次)	Credits(単位数)	Weekday and Period(曜日・時限)
	2026whole year	Graduate School of Medical Sciences (26067)	1, 2, 3, 4	2	others

Course Title(Theme)(科目名(講義題目))	Instructor(s)(担当教員)
Special Lecture I on Advanced Stem Cell Biology(H1)	MIHARADA Kenichi, TAKIZAWA Hitoshi, SHENG Guojun, OSHIUMI Hiroyuki, TAKAHASHI Yuta, MIZUNO Hidenobu, UMEMOTO Terumasa, ARIMA Yuichiro, ASAI Rieko, LIU Norika, KUROTAKI Daisuke

Goals with their ratio(学修成果とその割合)
1.Advanced expert knowledge, skill and research capability ‥‥50% 2.Profound inter-disciplinary knowledge ‥‥30% 3.Global perspective and ability to take initiative action ‥‥10% 4.Social leadership drive ‥‥10%

Type of Class(授業の形態)	Lecture
Teaching Method(授業の方法)	Lectures using presentation slides, followed by Q&A and a mini test
Course Goals(授業の目的)	Stem cells continuously generate the constituent cells of various organs and tissues over long periods of time and maintain homeostasis by repairing damage when it occurs. For this reason, stem cell biology is an essential field not only for understanding a wide range of pathological conditions, but also for the development of regenerative medicine technologies such as cell- and gene-based therapies. Research in this field is advancing at a remarkable pace, and the content to be learned is updated year by year. In this course (Advanced Lecture II), students will focus primarily on topics related to stem cell biology and molecular biology, with the aim of understanding the latest findings on mechanisms regulating stem cells and their therapeutic applications. All lectures in this course will be conducted in English.
Course Learning goals(学修目標)	【A level (A水準)】 Students will be able to develop an in-depth understanding of the following topics and explain them in detail, including relevant technical terminology and underlying molecular mechanisms: (1) mechanisms regulating self-renewal and differentiation of hematopoietic stem cells (2) the roles and dynamics of stem cells in neural circuit formation (3) cellular and genetic regulation in innate immunity (4) the roles of metabolic pathways in stem cell regulation (5) the roles of stem cells in embryonic development and developmental abnormalities (6) applications of stem cell research to regenerative medicine technologies 【C level (C水準)】 Students will be able to understand the following topics and explain their basic concepts and overall outlines: (1) mechanisms regulating self-renewal and differentiation of hematopoietic stem cells (2) the roles and dynamics of stem cells in neural circuit formation (3) cellular and genetic regulation in innate immunity (4) the roles of metabolic pathways in stem cell regulation (5) the roles of stem cells in embryonic development and associated abnormalities (6) applications of stem cell research to regenerative medicine technologies
Course Outline(授業の概要)	The course will primarily consist of lectures on the following topics, followed by Q&A sessions and short tests. Hematopoietic stem cells and regulation of hematopoiesis Neural circuits and stem cells Viruses and innate immunity Stem cells and metabolic regulation Embryonic development and stem cells Stem cells and cardiac development

Details for Individual Classes(各回の授業内容)

No.(回)	Date(月日)	Class Theme(授業テーマ)	Brief Outline of Class(内容概略)
1	10/06	6th period: MIHARADA Kenichi	Introduction to advanced stem cell biology
2	10/13	6th period: TAKIZAWA Hitoshi	Blood- and bone-forming stem cells I
3	10/20	6th period: TAKIZAWA Hitoshi	Blood- and bone-forming stem cells II
4	10/27	6th period: UMEMOTO Terumasa	Regenerative medicine and hematopoietic stem cells
5	11/10	6th period: MIZUNO Hidenobu	Stem cells in neuronal circuit formation
6	11/17	6th period: TAKAHASHI Yuta	Establishment and reprogramming of the epigenome during development
7	11/24	6th period: OSHIUMI Hiroyuki	Anti-viral innate immunity I
8	12/01	6th period: OSHIUMI Hiroyuki	Anti-viral innate immunity II
9	12/08	6th period: ARIMA Yuichiro	The Interplay Between Metabolism and Stem Cell Biology
10	12/15	6th period: ASAI Rieko	Neural crest development, multipotency, and congenital disorders
11	12/22	6th period: LIU Norika	Bench to Bedside: From basic research in cardiac development to stem cell–based therapies
12	01/05	6th period: SHENG Guojun	Animal development I (vertebrate body plan)
13	01/12	6th period: SHENG Guojun	Animal development II (gastrulation and stem cells in development)
14	01/19	6th period: KUROTAKI Daisuke	Epigenetic and chromatin structure analysis methods
15	01/26	6th period: MIHARADA Kenichi	Stem cells to red blood cells
Estimated out-of-class		As this is a 2-credit course, it is designed to require a total of 90 hours of student learning. Of these, 30 hours are	

study time	allocated to in-class instruction (2 hours × 15 sessions). The remaining 60 hours are expected to be devoted to preparatory and follow-up study, including assignments, in order to deepen understanding of the course content.
Required Textbook(テキスト)	No specific textbooks are assigned. Materials distributed by the instructor will be used as needed.
Reading List(参考文献)	Not specified
Enrollment Conditions(履修条件)	
Assessment Methods and Criteria(評価方法・基準)	Assessment will be based on the cumulative score of in-class question-and-answer sessions and post-lecture test (10 points each), with a maximum total score of 150 points.
Language Used in Instruction(使用言語)	English
Textbook/Material Language(教科書・資料の言語)	English
Course Based on Practical Work Experience(実務経験を活かした授業)	Not applicable