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 (26068)	1, 2, 3, 4	2	others

Course Title(Theme)(科目名(講義題目))	Instructor(s)(担当教員)
Special Lecture II on Advanced Stem Cell Biology(Advanced Stem Cell Biology)	OKAE Hiroaki

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
Course Goals(授業の目的)	Stem cells play a central role in the development and maintenance of tissue and organ homeostasis. For this reason, stem cell biology is an essential field not only for understanding normal development and congenital disorders, but also for the development of regenerative medicine technologies, including cell- and gene-based therapies. Research in this field is advancing at a remarkable pace in recent years, and the content to be learned is updated year by year. In this course (Advanced Lecture II), students will focus on topics related to stem cell biology and molecular biology, with the aim of understanding the latest findings on the roles of stem cells in embryonic development and on disease research using stem cells, in order to gain insights into the latest advances in the field. 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: ・Mechanisms regulating self-renewal and differentiation of pluripotent and somatic stem cells ・Reproductive engineering technologies supporting stem cell research ・Epigenomic regulation in stem cell research ・Roles of stem cells in embryonic development and their abnormalities ・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: ・Mechanisms regulating self-renewal and differentiation of pluripotent and somatic stem cells ・Reproductive engineering technologies supporting stem cell research ・Epigenomic regulation in stem cell research ・Roles of stem cells in embryonic development and their abnormalities ・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. ・Pluripotent stem cells and somatic stem cells ・Reproductive engineering technologies ・Epigenomic regulation in stem cells ・Embryonic development and stem cells ・Stem cells and disease research

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	10/08	6th period: Hitoshi Niwa	Mouse preimplantation development and stem cells
2	10/15	6th period: Takumi Era	Application of pluripotent stem cells for disease research
3	10/22	6th period: Toru Takeo	Frontiers in Assisted Reproductive Technologies
4	10/29	6th period: Hiroaki Okae	Historical background and basic principles of stem cell culture
5	11/05	6th period: Ryuichi Nishinakamura	Kidney Organoids: Present and Future
6	11/12	6th period: Shinjiro Hino	Stem cell regulation by nutrients and metabolites
7	11/19	6th period: Satoshi Tateishi	Cell cycle, Cellular senescence
8	11/26	6th period: Shinya Oki	Mammalian body axis formation
9	12/03	6th period: Akira Oike	Human pregnancy and placental development
10	12/10	6th period: Kazuya Matsuo (It is scheduled to be held online.)	Stem Cell Therapy for Neurodegeneration: Revisiting Disease Mechanisms
11	12/17	6th period: Joji Watase	The Role and Maintenance Mechanisms of Germline Stem Cells in Drosophila
12	12/24	6th period: Kenji Shimamura	Biology of neural stem cells and regenerative medicine
13	01/07	6th period: Jun Hatakeyama	Neural stem cell evolution and human brain development
14	01/14	6th period: Yusuke Ono	The biology of skeletal muscle stem cells
15	01/21	6th period: Saori Koga	Molecular mechanisms of hematopoietic stem cell development

Estimated out-of-class study time	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 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 a post-lecture test or a report for each lecture, each worth 10 points, 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