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)
RDM7-024-67-1	2025whole year	Graduate School of Medical Sciences (22140)	1, 2, 3, 4	2	others

Course Title(Theme)(科目名(講義題目))	Instructor(s)(担当教員)
Special Lecture "Tokuron" on Developmental Biology and Regenerative Medicine I(E1 Special Lecture "Tokuron" on Developmental Biology and Regenerative Medicine I)	Okae Hiroaki, Niwa Hitoshi, Shimamura Kenji, Era Takumi, Nishinakamura Ryuichi, Nakamura Akira, Kikuchi Koji, Takeo Toru, Oki Shinya, Takahashi Yuta, Guojun Sheng, Mizuno Hidenobu

Goals with their ratio(学修成果とその割合)
1.Advanced expert knowledge, skill and research capability ‥‥40% 2.Profound inter-disciplinary knowledge ‥‥30% 3.Global perspective and ability to take initiative action ‥‥20% 4.Social leadership drive ‥‥10%

Type of Class(授業の形態)	Lecture
Teaching Method(授業の方法)	PowerPoint will be used in the lectures, and active participation in the discussion is encouraged. E-learning and reports are considered for remote students and working students. Evaluation will be based on reports.
Course Goals(授業の目的)	In this course, you learn basic aspects of early development of tissues and organs, including in vivo development, organogenesis, and stem cell biology. Through the course, you will understand the regulatory mechanisms of pluripotent stem cells and tissue stem cells, the developmental mechanisms of organs derived from the ectoderm, endoderm, and mesoderm, the regulatory mechanisms of cellular functions, and epigenomic regulation that controls cell differentiation and proliferation.
Course Learning goals(学修目標)	【A level (A水準)】 Students are expected to acquire professional competence to understand and explain the following subjects; (1) Mechanisms of maintenance and differentiation of pluripotent stem cells and tissue stem cells, (2) Developmental mechanisms of organs derived from ectoderm, endoderm, and mesoderm, (3) Regulatory mechanisms of cellular functions, and (4) Epigenomic regulation that controls cell differentiation and proliferation at higher levels. 【C level (C水準)】 Students are expected to acquire general competence to understand and explain the following subjects; (1) Mechanisms of maintenance and differentiation of pluripotent stem cells and tissue stem cells, (2) Developmental mechanisms of organs derived from ectoderm, endoderm, and mesoderm, (3) Regulatory mechanisms of cellular functions, and (4) Epigenomic regulation that controls cell differentiation and proliferation at higher levels.
Course Outline(授業の概要)	Following topics including the most recent progress will be shown and discussed in addition to reading original papers. ・Stem cells and regenerative medicine ・Pregnancy and placental development ・Renal development and regeneration ・Development and regeneration of the brain ・Germ cell development ・Body plan of amniotes ・Development and epigenomic regulation

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	10/02	Thu. 4th period. Hitoshi Niwa	Self-renewal of pluripotent stem cells
2	10/09	Thu. 4th period. Hitoshi Niwa	Differentiation of pluripotent stem cells
3	10/16	Thu. 4th period. Takumi Era	Pluripotent stem cells and tissue stem cells
4	10/23	Thu. 4th period. Takumi Era	Clinical application of stem cells for human diseases
5	10/30	Thu. 4th period. Hiroaki Okae	Pregnancy and placental development
6	11/06	Thu. 4th period. Hiroaki Okae	Stem cell-based pregnancy research
7	11/13	Thu. 4th period. Ryuichi Nishinakamura	Molecular Mechanism of Kidney Development
8	11/20	Thu. 4th period. Kenji Shimamura	Pluripotent stem cells for developmental biology and regenerative medicine of the brain
9	11/27	Thu. 4th period. Akira Nakamura	How animals develop: what we can learn from studies of the germline in fruit flies, Drosophila.
10	12/04	Thu. 4th period. Koji Kikuchi	Role of Wnt signaling in animal development and pathologies caused by its abnormalities
11	12/11	Thu. 4th period. Toru Takeo	Biotechnologies of germ cells and early-stage embryos
12	12/18	Thu. 4th period. Shinya Oki	Regulation of spatial gene expression
13	12/25	Thu. 4th period. Yuta Takahashi	Epigenome programming and reprogramming during development
14	01/08	Thu. 4th period. Guojun Sheng	Amniote body plan: gastrulation and embryonic-extraembryonic demarcation
15	01/15	Thu. 4th period. Hidenobu Mizuno	Construction of functional neuronal circuit in the brain

Estimated out-of-class study time	60 hours
Required Textbook(テキスト)	Textbooks are not specified, and handouts will be distributed.
Reading List(参考文献)	Essential Developmental Biology, 5th edition by Slack JMW.,WW Norton & CO Developmental Biology, 13th edition by Scott Gilbert, Michael Barresi, Oxford university press
Enrollment Conditions(履修	Having basic knowledge related to this class

条件)	Having basic knowledge related to this class
Assessment Methods and Criteria(評価方法・基準)	Grading will be based on the student's understanding of the course subject matter as well as participation in class discussions. The students' understanding will be evaluated on the basis of reports or exams via the LMS e-learning Moodle system. Final grades will be based on the average of the top 10 scores.
Language Used in Instruction(使用言語)	Japanese and English
Textbook/Material Language(教科書・資料の言語)	Combination of Japanese and English
Course Based on Practical Work Experience(実務経験を活かした授業)	Not applicable