

Course number		G-LAS11 80027 LE68					
Course title (and course title in English)	先端生命科学特論 Cutting-edge Life Sciences			Instructor's name, job title, and department of affiliation	Graduate School of Biostudies Professor,IMAYOSHI ITARU Graduate School of Biostudies Professor,AOKI KAZUHIRO Graduate School of Biostudies Professor,TOUJU HIROKAZU Graduate School of Biostudies Associate Professor,YAMANO TAKASHI Graduate School of Biostudies Associate Professor,YOSHIMURA SHIGEHIRO Graduate School of Biostudies Junior Associate Professor,USUI TADAO Graduate School of Biostudies Program-Specific Junior Associate Professor,NISHIKAWA SEIYA		
Group	Interdisciplinary Graduate Courses			Field(Classification)	Natural Sciences		
Language of instruction	English			Old group		Number of credits	1
Hours	15	Class style	Lecture (Face-to-face course)		Year/semesters	2025・Intensive, Second semester	
Days and periods	Intensive Tue 3:30~6:45(pm.)		Target year	Graduate students	Eligible students	For science students	
(Students of Graduate School of Biostudies cannot take this course as liberal arts and general education course. Please register the course with your department.)							
[Overview and purpose of the course]							
生命科学領域の中で特に目覚ましい発展をとげている研究から、それぞれの領域の第一人者の先生に簡単な背景から将来の展望にいたるまでを講義をしていただき、大学院生の研究へのモチベーションを高めることを目的とする。また、近年急速に発展している生命情報解析について積極的に取り上げる。 Prominent leading scientists from several research fields of life science will provide their research histories from their backgrounds to future prospect, to encourage young scientists. In addition, we will actively address bioinformatics analysis, which has been rapidly developing in recent years.							
[Course objectives]							
Learning the most advanced topics in selected research fields such as cell and molecular biology, biophysics, plant science, neuroscience, developmental biology, regenerative medicine, bioinformatics and information science.							
[Course schedule and contents)]							
1 : Oct. 21 (Tue), 2025 15:30-16:45 17:00-18:15 Dr. Keiko Sugimoto (杉本 慶子 博士) Team Leader RIKEN Center for Sustainable Resource Science 理化学研究所 環境資源科学研究センター・チームリーダー Topics: Molecular mechanisms of plant regeneration							
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先端生命科学特論(2)

Keywords: cell reprogramming、 cell differentiation 、 cell proliferation 、 plant regeneration 、 plant organ growth

2 : Oct. 28 (Tue), 2025

15:30-16:45

17:00-18:15

Dr. Yasukazu Nakamura (中村 保一 博士)

Professor

Department of Informatics, National Institute of Genetics

国立遺伝学研究所 情報研究系・猫教授 #8232

Topics: Decoding 'Complete' Genomes: Breakthroughs in Sequencing and the Challenges in Data Sharing

Keywords: T2T genome sequencing technology, DDBJ and the INSDC, genome medicine for animals

3 : Nov. 11 (Tue), 2025

15:30-16:45

17:00-18:15

Dr. Teppei Shimamura (島村徹平 博士)

Professor

Department of Computational and Systems Biology,

Medical Research Laboratory, Institute of Integrated Research

Institute of Science Tokyo

東京科学大学 総合研究院 難治疾患研究所

計算システム生物学分野・教授#8232

Topics: Innovation through generative AI in life sciences

Keywords: Deep generative models, Cell state transition dynamics, Cell fate prediction simulation, Cell-to-cell communication inference, AI-based protein and peptide design

4 : Nov. 25 (Tue), 2025

15:30-16:45

17:00-18:15

Dr. Shigeyoshi Fujisawa (藤澤 茂義 博士)

Team Leader

RIKEN Center for Brain Science

理化学研究所脳神経科学研究センター・チームリーダー

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先端生命科学特論(3)

Topics: Information Processing of Time and Space in the Hippocampus

The hippocampus is a brain region that plays an important role in episodic memory, but the mechanisms of its neural circuits have not yet been fully elucidated. In this lecture, we will focus on “ temporal ” and “ spatial ” information processing, which are considered important in episodic memory, and discuss circuit computation and memory formation mechanisms in the hippocampus.

Keywords: Hippocampus, entorhinal cortex, place cells, lattice cells, theta wave, sharp wave ripple

*Please be aware that details are subject to change.

** Place: Large Seminar Room (1F), Science Frontier Bldg, South Campus

(Building 16 in the Faculty of Medicine campus. <https://www.kyoto-u.ac.jp/en/access/medicine-campus-map>)

[Course requirements]

None

[Evaluation methods and policy]

Evaluation will be based on attendance and effort. Further details will be announced in the first lecture.

[Textbooks]

Not used

[References, etc.]

(References, etc.)

Introduced during class

Related papers, which are useful to understand lectures, will be indicated in flyers.

[Study outside of class (preparation and review)]

Basic knowledge of molecular biology will be required to understand the course content. No particular preparation is necessary, but students are advised to read related papers, which will be useful to understand lectures.

[Other information (office hours, etc.)]

連絡担当教員: 今吉 格(imayoshi.itaru.2n@kyoto-u.ac.jp)

博士課程2回生以上の学生の出席も歓迎します。