科目ナンバリング	U-LAS14 20029 LE68						
授業科目名 <英訳>	Principles of Genetics-E2 Principles of Genetics-E2			担当者所属 職名・氏名	医学研究科　教授　THUMKEO, Dean		
群	自然科学科目群		分野(分類)	生物学(各論)		使用言語	英語
旧群	B群	単位数	2単位	週コマ数	1コマ	授業形態	講義（対面授業科目）
開講年度・開講期	2026・前期	曜時限	火4	配当学年	主として1・2回生	対象学生	理系向

[授業の概要・目的]

Genetics is the science of heredity and seeks to explain variation between related organisms at the genes level. All aspects of life are affected by genetic inheritance. Moreover, normal developmental events are regulated by genes, and mutations and aberrations of genes can lead to various genetic diseases.

In this course, we will learn about the basic concepts of genetic inheritance, i.e. how Mendelian traits are passed to the next generation. In addition, we will also review our current understanding of chromosomes, DNA, genes and their regulation. Finally, we will consider how such genes can control normal developmental events in organisms, whereas aberrant control of genes can lead to developmental failure and cancer.

To take this lecture, it is recommended to have some prior knowledge of biology. Otherwise, the student will have to prepare well before each class using the textbook or lecture handouts

[到達目標]

To acquire a basic understanding of the principles of classical and molecular genetics and their relevance and application to biomedical sciences, especially development and cancer.

[授業計画と内容]

Main Topics:
1.Introduction to genetics
2. Central Dogma (Cell and proteins)
3. Cell cycle, mitosis, chromatin architecture
4. Sickle cell anemia, splicing
5. Gene expression & meiosis
6. Gene structure, function
7. Epigenetics 1
8. Epigenetics 2, Genome variation 1
9. Genome variation 2
10. Genome variation 3 & Chromosome aberrations and disorders
11. Chromosome aberrations and disorders 2; Mendelian inheritance I
12. Mendelian inheritance II
13. Mendelian inheritance III
14. Pedigree, Extension of Mendel’s genetics & Review
15. Final exam
16. Feedback

Principles of Genetics-E2(2)へ続く↓↓↓

Principles of Genetics-E2(2)

[履修要件]

特になし

[成績評価の方法・観点]

Evaluation will be based on class attendance and participation (~30 %), a report (~10%) and a final examination (~60 %).

[教科書]

使用しない

Full handouts will be provided

[参考書等]

（参考書）

Ronald Cohn, et al. 『Thompson & Thompson Genetics and Genomics in Medicine, 9th edition』（Elsevier, 2024）ISBN:978-0-323-54762-8（A copy is available in Yoshida-South library）

[授業外学修（予習・復習）等]

I recommend students to confirm the handouts for each lecture and/or the relevant reference textbook to learn about the lecture content in advance of the class. Handouts for each lecture will be uploaded on LMS approximately one week before each class.

[その他（オフィスアワー等）]

Students are welcome to ask any questions in the class. Consultation via email or online meetings such as Zoom is possible. For those students who prefer to discuss directly with me, please arrange appointments by email in advance.

[主要授業科目（学部・学科名）]

理学部