

Molecular Genetics

Syllabus Number

5D242

Special Subjects

Elective 2 credit

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1. Course Description

The purpose of this course is to learn the following.

- (1) The structures of DNA and RNA
- (2) Replication of DNA
- (3) Gene expression and its regulation

2. Course Objectives

This course aims to understand the molecular mechanisms by which the genome is maintained and the genes are expressed or regulated.

3. Grading Policy

Final grade will be calculated according to the midterm examination (33%) and the final examination (67%). To pass, students must earn at least 60 points out of 100.

4. Textbook and Reference

Textbook

David Sadava et al. Text book for biology in a university. Vol. 2 Molecular genetics (in Japanese)
Kodansha Ltd., ISBN:978-4-06-257673-4

5. Requirements(Assignments)

Students have to prepare each lecture by reading the corresponding chapter in the textbook and summarizing the content of next lecture in a notebook. This preparation will take one hour.

There will be homework each week. Students should review the questions they did not understand in their homework. This review will take two hours.

6. Note

Students should take "Fundamental genetics". Please review the contents of "Fundamental genetics". Handout will be posted on LMS.

7. Schedule

- [1] Cell cycle and cell division
- [2] Chromosome distribution
- [3] Mendelian inheritance
- [4] Mendelian inheritance and non Mendelian inheritance
- [5] Genetic linkage and recombination
- [6] Structure of DNA
- [7] Replication of DNA
- [8] Midterm examination and commentary
- [9] Transcription
- [10] Translation, protein modification and mutation
- [11] DNA replication and gene expression in virus
- [12] Genetics in Prokaryote
- [13] Gene expression in Prokaryote
- [14] Genome and gene expression in Eukaryote
- [15] Final examination and commentary