

Advanced Course in Molecular Bioscience

Lecture Academic year 1,2 credits 1

[Keywords] Intercellular messenger, hormone, cytokine, autoinducer

[Academics] Keiji Nagano, Hiroshi Miyakawa

[Course aims]

Homeostasis in living organisms is maintained by a network of multiple biological reactions. Abnormal biological reactions and disordered networks cause diseases and lesions. Biological reactions occur through intercellular messengers, such as hormones, cytokines, and autoinducers, and control cell and tissue differentiation, growth, and regulation.

In this course, students will learn about the types, structures, and mechanisms of production and action of these intercellular messengers. Additionally, they will learn about the structure of receptors for intercellular messengers and their functional mechanisms and networks.

[Course objectives]

The goals of this course are for the student to be able to:

1. Explain types, structure, and functions of hormones as intercellular messengers
2. Explain types, structure, and functions of cytokines in immunocytes
3. Explain cytokine network of acquired immunity
4. Explain types, structure, and functions of autoinducers as intercellular messengers
5. Explain the role of autoinducers in biofilm formation

[Course content]

Class	Theme	Content	Academics
1	Types, structure, and functions of intercellular messengers, such as hormones, cytokines, and autoinducers		Keiji Nagano Hiroshi Miyakawa
2	Detection and quantification of hormones, cytokines, and autoinducers		Keiji Nagano Hiroshi Miyakawa
3	Reading and presenting references on intercellular messengers		Keiji Nagano Hiroshi Miyakawa
4	Literature survey, discussion, and presentation on a specific subject		Keiji Nagano Hiroshi Miyakawa

[Class implementation method]

Combination of face-to-face learning and distance learning

\* Class implementation depends on the implementation policy of each department (graduate school), interdisciplinary studies, and school.

[Grading policies]

Your overall grade in the class will be based on your class attendance and reports.

[Textbook]

Inform students about the textbooks that will be used.

[Reference book]

Same as above

[Preparation for course]

Students must understand the course objectives and prepare accordingly for the classes.