

Advanced Course in Microbiology

Lecture/Lab. Academic year 1,2 credits 2,4

[Keywords] Oral infectious disease, Oral biofilm, Anaerobic culture, Identification methods, PCR.

[Academics] Keiji Nagano, Hiroshi Miyakawa

[Course aims]

It is known that many bacteria belonging to the oral flora cause infectious diseases, such as dental caries and periodontal disease, by forming oral biofilms. Bacteria that form oral biofilms are either facultative or obligate anaerobes, and their culturing may be difficult in some cases. Therefore, to study the flora of oral biofilms, we have to learn culturing methods for anaerobic bacterial species and genetic identification methods such as polymerase chain reaction (PCR). Furthermore, it is important to understand the relationship between bacterial species of the oral flora and oral infectious diseases.

In this course, students will learn the characteristics of the oral microflora, bacterial virulence, taxonomy of bacteria, and identification techniques.

[Course objectives]

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

- (1) Explain the role of oral biofilms in infectious diseases
- (2) Analyze microflora using culturing methods
- (3) Explain the principles of biochemical identification methods
- (4) Explain the methods for quantification and identification of bacterial species using PCR

[Course content]

Class	Theme	Content	Academics
1	The role of biofilms in infectious diseases		Keiji Nagano Hiroshi Miyakawa
2	Forming and analyzing experimental biofilms		Keiji Nagano Hiroshi Miyakawa
3	Anaerobic cultivation method for identification of bacteria from oral biofilms		Keiji Nagano Hiroshi Miyakawa
4	Identification of bacterial species based on their biological properties		Keiji Nagano Hiroshi Miyakawa
5	Identification of bacteria using PCR "		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]

The overall grade in the class will be decided based on class attendance and reports.

[Textbook]

Inform students which textbook will be used

[Reference book]

Same as above

[Preparation for course]

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