

Advanced Course in Oral Biochemistry

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

[Academics] Toshiya Arakawa

[Course aims]

Course aims

This course deals with the molecular biology in maintaining periodontal ligament (PDL). To understand biology of PDL is critical to keep oral function. This course comprises basic concepts in molecular biology concerning 1) functions of extracellular matrix in PDL; 2) signal transduction pathways of mechanical stress in PDL fibroblasts; and 3) mechanical stress-induced gene expression in PDL fibroblasts. In addition, this course includes a basic training in gene editing.

[Course objectives]

At the end of this course, students should be able to:

- (1) Explain the function of extracellular matrixes involved in PDL.
- (2) Explain the signaling pathway involved in PDL fibroblasts.
- (3) Analyze the function of genes using gene editing.

[Course content]

Class	Theme	Content	Academics
1	Classroom lectures	Molecular biology of : 1)Molecular mechanisms of PDL. 2)Gene editing.	Toshiya Arakawa
2	Laboratory courses	Special focus on: 1)Gene cloning. 2)Analysis of gene expression. 3)Technique of gene editing.	Toshiya Arakawa

[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]

Students will be graded based on class attendance and reports.

[Textbook]

Students will be informed regarding the textbook.

[Reference book]

Same as above

[Preparation for course]

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

[Keywords]

PDL, Mechanical stress, Gene expression, Gene editing,