

[Keywords] cementum, periodontal tissue, alveolar bone, bone remodeling, reconstruction, morphology

[Academics] Yasunori Sakakura

[Course aims]

In dentistry today, there are a number of alternatives including implants and tooth transplantation to rescue masticatory function. These treatments might have to be adapted for reconstruction of periodontal tissue and adjacent bone using metal, ceramic, and transplanted teeth. Accordingly, it is very important to understand the mechanism of regeneration of periodontal tissue including alveolar bone and cementum. In this course, the aim is to construct a theoretical basis for reconstruction of periodontal tissue including bone and cementum through investigation of bone and periodontal remodeling with histologic and immunohistochemical methods.

[Course objectives]

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

- 1) Understand the cells and extracellular matrices that constitute periodontal tissues and the mechanism of remodeling in these tissues.
- 2) Understand animal ethics in the laboratory.
- 3) Know how to prepare paraffin, frozen and electron microscopic sections, and understand methods used for sample collection, fixation, sectioning, staining, and examination.
- 4) Stain paraffin and frozen sections using several methods, including enzyme histochemistry and immunohistochemistry.
- 5) Accurately use experimental devices and machines such as light, fluorescent, and electron microscope.
- 6) Objectively evaluate own results.
- 7) Explain logically the scientific significance of own results by comparing experimental results with already reported data.

[Course content]

| Class | Theme | Content | Academics |
|-------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| 1 | Classroom lectures for characteristics of periodontal tissues and their reconstruction. | | Yasunori Sakakura |
| 2 | Classroom lectures for animal ethics in the laboratory. | | Yasunori Sakakura |
| 3 | Laboratory courses focused on understanding morphologic approaches and mastering their techniques: | 1) Preparation of sections for paraffin, frozen and electron microscopy, including methods for collection, fixation, sectioning, staining, and examination of samples. 2) Preparation of paraffin and frozen sections using several staining methods including enzyme histochemistry and immunohistochemistry. 3) Techniques used for evaluation by light, fluorescent and electron microscopy. | Yasunori Sakakura |
| 4 | Classroom lectures for evaluating experimental results and logical understanding of their scientific significance. | | Yasunori Sakakura |
| 5 | Preparation of a poster presentation for a meeting. | | Yasunori Sakakura |

[Grading policies]

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

[Textbook]

Students will be informed of which textbook to use.

[Reference book]

Students will be informed of which reference book to use.

[Preparation for course]

Students must understand the objectives of the course and prepare appropriately for classes.