

[Keywords] Blood coagulation, genetic analysis, warfarin

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[Course aims]

In clinical practice, dentists often need to manage patients with thrombosis or a bleeding tendency and those receiving warfarin. Therefore, dentists are expected to understand the mechanism and management of coagulopathy. This course deals with genetic and functional analyses of coagulation factors and its regulating factors using various techniques from molecular biology for a better understanding of the background of patients with blood coagulation problems.

[Course objectives]

The goal of this course are for students to be able to:

1. Explain the intrinsic and extrinsic pathways of the blood coagulation cascade.
2. Explain the effects of coagulation regulating factors on the coagulation reaction.
3. Explain the pathogenesis of congenital coagulopathy, including the manner of its inheritance.
4. Explain the management of patients receiving warfarin in a dental clinic.
5. Learn the methods of direct sequencing used in molecular biology.
6. Learn the methods for plasmid expression assays, including for mutagenesis, used in molecular biology to gain

a precise

understanding of genetic coagulopathy abnormalities.

[Course content]

| Class | Theme | Content | Academics |
|-------|---|--|-------------------------------------|
| 1 | Classroom lectures on blood coagulation and its regulating factors such as anti-thrombin, protein C, and protein S. | | Masahiro Ieko Nobuhiko Takahashi |
| 2 | Laboratory courses focused on understanding molecular biological approaches and learning the techniques used to study the pathogenesis of coagulopathy. | 1) Genetic analysis of congenital coagulopathy (reverse transcription-polymerase chain reaction method, DNA sequencing method) 2) Database search for gene mutation and its evaluation 3) Functional analysis of mutant protein (mutant vector DNA preparation, transfection to culture cells, expression of mutant protein, measuring coagulation activity) | Masahiro Ieko Nobuhiko Takahashi |
| 3 | Preparation of the results obtained for presentation at medical society meetings and publication in specific journals. | | Masahiro Ieko Nobuhiko Takahashi |

[Class implementation method]

Combination of face-to-face learning and distance learning

Class implementation depends on the implementation policy of each department (graduate school) or school.

[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 course objectives and prepare appropriately for the classes.