Pulp Biology and Endodontics

1. Staffs and Students (April 2012)

Professor  
Hideaki SUDA

Associate Professor  
Chihiro KOBAYASHI, Mitsuhiro SUNAKAWA

Junior Associate Professor  
Atsushi TAKEDA, Hideharu IKEDA

Assistant Professor  
Arata EBIHARA, Nobuyuki KAWASHIMA, Hiroyuki MATSUMOTO, Reiko WADACHI, Noriyuki SUZUKI, Hitomi HANADA

Clinical staff  
Satoshi WATANABE, Jun KAWAMURA, Yu KOIZUMI, Chizuko KOKUZAWA, Toshihiko YOSHIOKA, Tetsu SATO

Graduate Student  
Kouyou TAKIMOTO, Mengyu ZHOU, Ying LI, Kei KOMATSU, Kana MIYARA, Mioko YAMAMOTO, Ahmed Osama JAMLEH, Jindan PIAO, Kazuto HURUHATA, Saliman AIERKIN, Jie GU

2. Purpose of Education

The aim of the course is to train and educate graduate dental students so that they can act as leading clinical scientists, researchers or practitioners of endodontics in the world. Since recent progress of pulp biology and endodontics is remarkable, the students are educated to acquire the newest knowledge on modern endodontology and its related subjects, such as pulp biology, neuroscience, bacteriology, immunology and material sciences, and are trained to master the newest technology of endodontics. All the students are asked to add new findings to the field of endodontics based on their own original research. The graduates from this course are expected to disseminate new principles and techniques on endodontics among general dental practitioners and endodontic specialists.

3. Research Subjects

1) Defense systems in the dental pulp/periapical tissue
2) Regulation of periapical bone destruction in apical periodontitis
3) Dental pulp stem cells/ Differentiation of pulp cells/ Horizon of pulpal regeneration
4) Root canal irrigation
5) Improvement of new apex locators
6) Strain produced in the root canal wall dentin
7) Application of medicaments to endodontics
8) Evaluation of endodontic technique using computational fluid dynamics (CFD)
9) Histochemical study using cultured mandible tissue model
10) Application of laser to endodontics
11) Application of optical coherence tomography
12) Analysis of nickel-titanium endodontic instruments
13) Electrophysiological approach to cell-to-cell couplings between odontoblasts
14) Diffusion through enamel and dentin
15) Evidence for an innocuous sensation in the dental pulp
16) Lymphangiogenesis in the dental pulp
17) Neuro-scientific research for dental pain
18) Molecular biological approach to the alveolar bone resorption associated with pulpal diseases
19) Three dimensional analysis of periapical bone loss using CBCT
20) Effect of motion artifacts on dental CT images
21) Global Center of Excellence (GCOE) Program
   “International Research Center for Molecular Science in Tooth and Bone Diseases”

4. Clinical Services
Pulp Biology and Endodontics is in charge of the Endodontic Clinic in our Dental Hospital, and offers the global standard of endodontics to our patients. The representative treatments provided in our clinic are as follows:

- Diagnosis and treatment of pulpal and periapical diseases
- Protective procedures for the dental pulp
- Nonsurgical endodontic treatment
- Surgical endodontic treatment
- Bleaching discolored teeth
- Restoration of endodontically treated teeth

The latest development of endodontics is remarkable as seen in root canal instrumentation by super-elastic NiTi rotary files, root canal length measurement with newly developed electronic apex locators, diagnosis by cone beam computed tomography, and microendodontics by using a surgical microscope. Especially, microendodontics has dramatically changed conventional “blind” endodontics into more predictable endodontics by efficient and reliable procedures under a lightened and magnified view. Also, we seek to provide evidence-based endodontic treatment based on our clinical research.

5. Publications

Original articles

Review articles