

## Pulp Biology and Endodontics

### 1. Staffs and Students (April 2010)

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	Jing XU,	Jun KAWAMURA,
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	Hitoshi SAKAUE,	Toshihiko YOSHIOKA,
	Bolortuya GOMB,	Uraivan CHOKECHANACHAISAKUL,
	Kouyou TAKIMOTO,	Mengyu ZHOU,
	Ying LI,	Kei KOMATSU,
	Kana MIYARA,	Mioko YAMAMOTO,
	Ahmed Osama JAMLEH,	Jindan PIAO,
	Kazuto HURUHATA	

### 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
- 2) Elucidation of periapical pathosis and regulation of periapical bone destruction
- 3) Developmental mechanisms of dentin/pulp complex and horizon of its regeneration
- 4) Root canal irrigation
- 5) Development of the new apex locator
- 6) Strain of the root canal dentin
- 7) Application of medicine to endodontics
- 8) Safety control in dentistry
- 9) Application of laser to endodontics
- 10) Analysis of nickel-titanium endodontic instruments
- 11) Electrophysiological approach to cell-to-cell couplings between odontoblasts
- 12) Diffusion through enamel and dentin
- 13) Lymphangiogenesis in the dental pulp
- 14) Neuro-scientific research for dental pain
- 15) Logistic regression equation to screen for vertical root fractures using cone-beam CT (3DX)
- 16) Global Center of Excellence (GCOE) Program  
"International Research Center for Molecular Science in Tooth and Bone Diseases"
- 17) Molecular biological approach to the alveolar bone resorption associated with pulpal diseases
- 18) Sealing ability of temporally filling and retrofilling materials
- 19) Application of optical coherence tomography

## 20) Diagnosis using CBCT

**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**

1. Saegusa H, Watanabe S, Anjo T, Ebihara A, Suda H: Safety of Laser use under the Dental Microscope . Australian Endodontic Journal 36(1); 6-11.
2. Hanada T, Quevedo C, Okitsu M, Yoshioka T, Iwasaki N, Takahashi H, Suda H: Effects of new adhesive resin root canal filling materials on vertical root fractures. Australian Endodontic Journal 36(1); 19-23.
3. Sun H, Kawashima N, Xu J, Takahashi S, Suda H: Expression of Notch signalling-related genes in normal and differentiating rat dental pulp cells. Australian Endodontic Journal 36(2); 54-58.
4. Watanabe S, Saegusa H, Anjo T, Ebihara A, Kobayashi C, Suda H: Dentin strain induced by laser irradiation. Australian Endodontic Journal 36(2); 74-78.
5. Rittling S, Zetterberg C, Yagiz K, Skinner S, Suzuki N, Fujimura A, Sasaki H: Protective Role of Osteopontin in Endodontic Infection. Immunology 129(1); 105-114.
6. Sasaki H, Suzuki N, Alshwaimi E, Xu Y, Battaglino R, Morse L, Stashenko P: 18b-Glycyrrhetic acid inhibits periodontitis via glucocorticoid-independent nuclear factor-kB inactivation in interleukin-10-deficient mice. Journal of Periodontal Research 45(6); 757-763.
7. Adorno CG, Yoshioka T, Suda H: The effect of working length and root canal preparation technique on crack development in the apical root canal wall. International Endodontic Journal 43(4); 321-327.
8. Wang S, Kawashima N, Sakamoto K, Katsube K, Umezawa A, Suda H: Osteogenic differentiation of mouse mesenchymal progenitor cell, Kusa-A1 is promoted by mammalian transcriptional repressor Rbpj. BBRC 400(1); 39-45.
9. Wang HG, Kawashima N, Iwata T, Xu J, Takahashi S, Sugiyama T, Suda H: Differentiation of Odontoblasts Is Negatively Regulated by MEPE via Its C-Terminal Fragment. BBRC 398; 406-412.
10. Kawamura J, Kaneko T, Kaneko M, Sunakawa M, Kaneko R, Chokechanachaisakul U, Okiji T, Suda H: Neuron-immune interactions in the sensitized thalamus induced by mustard oil application to rat molar pulp. J Dent Res 89(11); 1309-1314.
11. Kaneko T, Okiji T, Kaneko R, Sunakawa M, Kaneko M, Suda H: Gene Expression Analysis of Acutely Traumatized Pulps. JOE 36(1); 78-82.
12. Chokechanachaisakul U, Kaneko T, Okiji T, Kaneko R, Kaneko M, Kawamura J, Sunakawa M, Suda H: Increased Gene Expression of Toll-like Receptors and Antigen-Presenting Cell-related Molecules in the Onset of Experimentally Induced Furcation Lesions of Endodontic Origin in Rat Molars. JOE 36(2); 251-255.
13. Kaneko T, Kaneko M, Chokechanachaisakul U, Kawamura J, Kaneko R, Sunakawa M, Okiji T, Suda H: Artificial Dental Pulp Exposure Injury Up-regulates Antigen- Presenting Cell-related Molecules in Rat Central Nervous System. JOE 36(3); 459-464.