

## Biostructural Science

### 1. Staffs and Students (as of April, 2009)

Professor	Yoshiro TAKANO	
Associate Professor	Makoto J TABATA	
Assistant Professor	Otto BABA,	Takuya NOTANI,
	Yoko SHUDA (on leave for child care)	
Project Assistant Professor (Good Practice Education Program)	Masayuki YOSHIMI	
Technician	Hachiro ISEKI	
Graduate Student	Masud AHMAD,	Devi Sewvandini ATUKORALA,
	Ravindra Kumar Ratnayake	
Research Fellow	Jyun-ichi MATSUNARI,	Hitoshi TAMAKI,
	Nobuyuki TAKAHASHI,	Dawud ABDUWELI

### 2. Purpose of Education

#### [Undergraduate Education]

Provide dental students with the essential knowledge and methods of studies necessary to understand fundamentals of structure and function of the human body, based primarily on macroscopic- and microscopic anatomy (Histology), including dissection lab works which lasts nearly 3 months. Emphasis is placed on the structure and function of oral and maxillofacial regions including teeth, periodontal tissues, salivary glands and temporomandibular joints, as well as muscles and nerves related to these structures. These comprise major part of the largest teaching module of the 3<sup>rd</sup>-year dental education curriculum and are expected to build solid basis for future studies of advanced dental science and clinical medicine.

#### [Graduate School]

Provide graduate students with updated information of mechanisms of biological mineralization, structural features, as well as ontogenic and evolutionary aspects of the development of biological hard tissues, and give a lab course of essential methods for structural analyses of hard tissues, particularly of teeth and periodontal tissues.

### 3. Research Subjects

The mechanisms of dental and periodontal tissue formation and their regeneration is the central focus of our research. Followings are rough description of current research subjects in our laboratory.

- 1) Biological mineralization.
- 2) Induction and/or regeneration of dental and periodontal tissues.
- 3) Reaction-diffusion phenomenon in biological systems
- 4) Origin and evolution of tooth
- 5) Molecular mechanisms of tooth development
- 6) Role of dentin matrix proteins in the development of root and periodontal tissues
- 7) Sensory apparatus in masticatory systems.

### 4. Clinical Services

### 5. Publications

#### Original Article

1. Yagi Y, Suda N, Yamakoshi Y, Baba O, Moriyama K: *In Vivo* Application of Amelogenin Suppresses Root Resorption. *J Dent Res*, 88:176-81, 2009.
2. Geurtsen J, Chedammi S, Mesters J, Cot M, Driessen NN, Sambou T, Kakutani R, Ummels R, Maaskant J, Takata H, Baba O, Terashima T, Bovin N, Vandenbroucke-Grauls CMJE, Nigou J, Puzo G, Lemassu A, Daffe M, Appelmelk BJ: Identification of mycobacterial alpha-glucan as a novel ligand for DC-SIGN: involvement of mycobacterial capsular polysaccharides in host immune modulation. *J Immunol*, 183:5221-31, 2009.
3. Suzuki N, Hayakawa K, Kameda T, Triba A, Tang N, Tabata MJ, Takada K, Wada S, Omori K, Srivastav AK, Hattori A: Monohydroxylated polycyclic aromatic hydrocarbons inhibit both osteoclastic and osteoblastic activities in teleost scales. *Life Sci*, 84:482-488, 2009.
4. Suzuki N, Omori K, Nakamura M, Tabata MJ, Ikegame M, Ijiri K, Kitamura K, Shimizu N, Kondo T, Matsuda K,

Ando H, Kasahara H, Nagase M, Nara M, Hattori A: Scale osteoblasts and osteoclasts sensitively respond to low-gravity loading by centrifuge. *Biol Sci Space*, 22:3-7, 2009.

## Review Article

## Book

1. Terashima T, Baba O, Oida S: Amelogenesis in Organ Culture of Tooth Germs. In: Enamel [Formation, Structure, Heredity, Origin and Evolution], Wakaba Publishing, 263-276, 2009.
2. Inohaya K, Takano Y, Kudo A: Bones. In *Medaka Biology, Management and Experimental Protocols* Ed; Kinoshita M et al., Wiley-Blackwell, 234-243, 2009.
3. Nobuo Suzuki, Makoto Tabata, Atsuhiko Hattori: Kingyo, Ed. By N. Suzuki, In: *Experiment using familiar animals 1*, Sankyo Publisher, 31-77, 2009.

## Awards

## Abstracts

### [International Meeting]

1. Tamaki H, Nakayama H, Takano Y: Histological evaluation of osteoconductivity and fate of anorganic bovine bone fragments (Bio-Oss®) applied for sinus augmentation preceding implant, Academy of Osseointegration Annual Meeting, February 26- 28, 2009, San Diego, CA, USA.
2. Takano Y: Cement lines and bone quality - A lesson from studies of long-lasting cement lines in osteopetrotic bones of aging *c-src* deficient mice, Invited lecture, Material Research Society Spring Meeting 2009, April 14, 2009, San Francisco, CA, USA.
3. Yagi Y, Suda N, Yamakoshi Y, Baba O, Moriyama K: Amelogenin is a Potent Inhibitor of Odontoclastic Root Resorption. 87<sup>th</sup> General Session of the IADR, April 1-4, 2009, Miami, FL, USA.
4. Takano Y: Regulatory Mechanisms of Enamel Maturation. 2<sup>nd</sup> Meeting of IADR Pan Asian Pacific Federation (PAPF) & 1<sup>st</sup> Meeting of IADR Asia/Pacific Region (APR) & 57<sup>th</sup> JADR General Session, Sept. 22-24, 2009, Wuhan, China.
5. Tabata MJ, Notani T, Iseki H, Baba O, Takano Y: Segregation and motility of enamel organ-derived cells in culture. 2<sup>nd</sup> Meeting of IADR Pan Asian Pacific Federation (PAPF) & 1<sup>st</sup> Meeting of IADR Asia/Pacific Region (APR) & 57<sup>th</sup> JADR General Session, Sept. 22-24, 2009, Wuhan, China.
6. Baba O, Atukorala ADS, Tabata MJ, Mitani H, Takano Y: The expression of edar transcripts during tooth formation in medaka. 2<sup>nd</sup> Meeting of IADR Pan Asian Pacific Federation (PAPF) & 1<sup>st</sup> Meeting of IADR Asia/Pacific Region (APR) & 57<sup>th</sup> JADR General Session, Sept. 22-24, 2009, Wuhan, China.
7. Tamaki H, Nakayama H, Takano Y: Evaluation of the fate of anorganic bovine bone fragments (Bio-Oss®) applied for sinus augmentation by histochemical and cytological methods with special references to the interaction with osteoclasts. European Association for Osseointegration 18<sup>th</sup> Annual Scientific Meeting, Sept. 30-Oct. 3, 2009, Monaco.

### [Domestic Meeting]

1. Atukorala ADS, Higuchi K, Yoshimi M, Tabata M, Baba O, Takano Y: Edar deficient medaka: Phenotype analysis of animal model for anhydrous ectodermal dysplasia. 114<sup>th</sup> General Session of Japanese Association for Anatomists, May 28-30, 2009, Okayama.
2. Tabata MJ, Notani T, Iseki H, Nakayama H, Baba O, Takano Y: Cell-cell interaction and tissue restructure of enamel epithelial cells and pulpal cells in novel 3D-layered culture. 114<sup>th</sup> General Session of Japanese Association for Anatomists, May 28-30, 2009, Okayama.
3. Tabata MJ, Notani T, Iseki H, Baba O, Takano Y: Proliferation differentiation, and motility of cultured enamel epithelial cells. 51<sup>st</sup> General Session of Japan Association for Oral Biology, Sept 9-11, 2009, Niigata.
4. Notani T, Tabata MJ, Iseki H, Yoshimi M, H, Baba O, Takano Y: Cell differentiation and tissue restructure of ameloblasts and pulpal cells in three-dimensional and layered culture (TDL culture). 51<sup>st</sup> General Session of Japan Association for Oral Biology, Sept 9-11, 2009, Niigata.
5. Ida H, Nakagawa E, Baba O, Oda K, Terashima T, Ohshima H: Localization of glycogen and glucose transporters during developmental process of mouse tooth germs. 51<sup>st</sup> General Session of Japan Association for Oral Biology, Sept 9-11, 2009, Niigata.

6. Baba O, Devi Atukorala, Tabata MJ, Takano Y: EDAR gene expressions in the forming regions of jaw and pharyngeal teeth in medaka. 51<sup>st</sup> General Session of Japan Association for Oral Biology, Sept 9-11, 2009, Niigata.
7. Inohaya K, Takano Y, Kudo A: wnt4b expression in floor plate cells is essential for the segmentation of the vertebral column. 80<sup>th</sup> General Session of Zoological Society of Japan, Sept 17-20, 2009, Shizuoka.

[Invited Lectures]

1. Takano Y: Bone formation and resorption in the acellular skeletal system of small in medaka, a small-sized teleost. The 114<sup>th</sup> Annual Meeting of Japanese Association of Anatomists, Mar 28, 2009, Okayama.
2. Takano Y: Cement lines and bone quality - A lesson from studies of long-lasting cement lines in osteopetrotic bones of aging *c-src* deficient mice, Invited lecture, Material Research Society Spring Meeting 2009, April 14, 2009, San Francisco, CA, USA.
3. Takano Y: Cellular regulation of enamel formation and maturation. Graduate School Seminar at the Graduate School of Nippon Dental University, Nov. 15, 2009, Tokyo.