

# Division of Orthodontics and Dentofacial Orthopedics

## Department of Oral Growth and Development

### Outline

The specialty of orthodontics is concerned with the study and treatment of malocclusions, which may be a result of tooth irregularity, disproportionate jaw relationships and orofacial malfunctions. Orthodontic treatment focuses not only on dental and occlusal problems, but also deals with the control and modification of maxillofacial growth and morphology. High-quality outcomes of orthodontic treatment can only be accomplished with comprehensive knowledge about growth and development of maxillofacial region, occlusion, materials sciences, and diagnostics and therapeutics of malocclusion. Our research interests were shown below.

### Faculty members

Professor: Masahiro IJIMA, D.D.S., Ph.D.

Assistant professor/full-time lecturer: Takeshi MUGURUMA, D.D.S.

Assistant professor/research associate:

Yuya NAKAO, D.D.S., Ph.D., Yuki TOMITA, D.D.S., Ph.D., Yumiko ENAMI-TANAKA, D.D.S., Ph.D., Ryota NAGASAKI, D.D.S., Ph.D., Dai TSUCHIDA, D.D.S., Ph.D., Zuñiga Heredia ENRIQUE EZRA, D.D.S., Ph.D.,

Clinical instructor:

Ryusuke YAMADA, D.D.S., Ph.D.



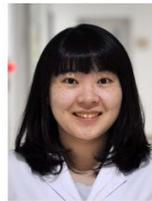
Masahiro IJIMA



Takeshi MUGURUMA



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Yuki TOMITA



Yumiko ENAMI-TANAKA



Ryota NAGASAKI



Dai TSUCHIDA



Zuñiga Heredia  
ENRIQUE EZRA



Ryusuke YAMADA

### Postgraduate students

Kana EGAMI, D.D.S., Yuri SEKI, D.D.S., Jin TSUCHIDA, D.D.S., Yuko MATSUKI, D.D.S. Shotaro YAMAZAKI, D.D.S., Tadaharu YOKOGAWA, D.D.S. Yuka EGAMI, D.D.S., Yura Kon, D.D.S., Koken SATO, D.D.S.,



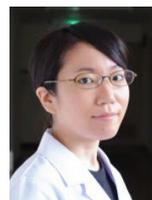
Kana EGAMI



Yuri SEKI



Jin TSUCHIDA



Yuko MATSUKI



Shotaro YAMAZAKI



Tadaharu YOKOGAWA



Yuka EGAMI



Yura KON



Koken SATO

## **Main research in progress**

- 1) Extracellular matrix in the temporomandibular joint (TMJ)
- 2) Orthodontic materials research
- 3) Three dimensional (3D) analysis of orthodontic tooth movement
- 4) Development of 3D bioprinting scaffold for bone replacement in craniofacial region
- 5) Development of bioabsorbable magnesium alloys for bone fixation plates and orthodontic mini-implants
- 6) Signaling by mechanical strain in human periodontal ligament cells in vitro

## **Current publications**

- \* Nakao Y, et al. Proteoglycan expression is influenced by mechanical load in rat TMJ discs. *J Dent Res* 94:93-100, 2015.
- \* Kawamura N, et al. Wear characteristics and inhibition of enamel demineralization of resin-based coating materials. *Eur J Oral Sci*, 125: 160-167, 2017.
- \* Muguruma T, et al. Corrosion of laser-welded stainless steel orthodontic wires. *Orthodontic Waves* 77:18-23, 2018.
- \* Iijima M, et al. Effects of the addition of strontium-containing bioactive glass to 4-META/MMA-TBB-based resin on the remineralization process of etched dental enamel. *J Biomater Tiss Eng* 8(4): 1375-1526, 2018.
- \* Iijima M, et al. Effects of pastes containing ion-releasing particles on dentin remineralization. *Dent Mater J* 38(2): 271-277, 2018.
- \* Muguruma T, et al. Corrosion of laser-welded stainless steel orthodontic wires. *Orthodontic Waves* 77: 18-23, 2018.
- \* Muguruma T, et al. Effects of sp<sup>2</sup>/sp<sup>3</sup> ratio and hydrogen content on in vitro bending and frictional performance of DLC-coated orthodontic stainless steels. *Coatings* 8(6)-199: 1-12, 2018.
- \* Tomita Y, et al. Accuracy of digital models generated by conventional impression/plaster-model methods and intraoral scanning. *Dent Mater J* 37(4): 628-633, 2018
- \* Zuniga-Heredia E E, et al. Slot tolerance and frictional resistance of new and recycled self-ligating brackets. *The dental Journal of Health Science University of Hokkaido* 37(2): 121-126. 2018.
- \* Kawamura N, et al. Degradation and biocompatibility of AZ31 magnesium alloy implants in vitro and in vivo: a micro-computed tomography study in rats. *Materials* 19;13(2), 2020.
- \* Nagasaki R, Ishikawa R, Ito S, Saito T, Iijima M. Effects of polishing with paste containing surface pre-reacted glass-ionomer fillers on enamel remineralization after orthodontic bracket debonding. *Microsc Res Tech* 84: 171-179. 2021..