

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.

Associate professor: Takeshi MUGURUMA, D.D.S.

Assistant professor/full-time lecturer: Yuya NAKAO, D.D.S., Ph.D.,

Assistant professor/research associate:

Ryota NAGASAKI, D.D.S., Ph.D., Dai TSUCHIDA, D.D.S., Ph.D., Zuñiga Heredia ENRIQUE EZRA, D.D.S., Ph.D., Kana EGAMI, D.D.S., Ph.D., Yuko MATSUKI, D.D.S., Ph.D.,

Clinical instructor:

Jin TSUCHIDA, D.D.S., Ph.D., Shotaro YAMAZAKI, D.D.S., Ph.D.



Masahiro IJIMA



Takeshi MUGURUMA



Yuya NAKAO



Ryota NAGASAKI



Dai TSUCHIDA



Zuñiga Heredia
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Kana EGAMI



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Shotaro YAMAZAKI

Postgraduate students

Tadaharu YOKOGAWA, D.D.S. Yuka EGAMI, D.D.S., Yura KON, D.D.S., Koken SATO, D.D.S.,

Takahiro SAKURADA, D.D.S., Takehiro NATSUME, D.D.S., Taku MANABE, D.D.S., Yuki EGAMI, D.D.S., Yukiko NOGUCHI, D.D.S.



Tadaharu YOKOGAWA



Yuka EGAMI



Yura KON



Koken SATO



Takahiro SAKURADA



Takehiro NATSUME



Taku MANABE



Yuki EGAMI



Yukiko NOGUCHI

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 sp²/sp³ 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.
- * Tsuchida D, et al. Effectiveness of *Acanthopanax Senticosus* Harms in a Mouse Model of Nickel Allergy. *Adv Dent & Oral Health* 15(4): 555918. 2022.
- * Seki Y, et al. Differentiation ability of Gli1+ cells during orthodontic tooth movement. *Bone* 166(7): 2022.
- * Yokogawa T, et al. Characterization of a *Treponema denticola* ATCC 35405 mutant strain with mutation accumulation, including a lack of phage-derived genes. *PLOS ONE* 17(6): e0270198. 2022.
- * Nagasaki R, et al. Synthesis and Characterization of Bioactive Glass and Zinc Oxide Nanoparticles with Enamel Remineralization and Antimicrobial Capabilities. *Materials* 16(21): 6878. 2023.
- * Tsuchida D, et al.. Allergenicity and Bioavailability of Nickel Nanoparticles Compared to Nickel Microparticles in Mice. *Materials* 16(5):1834. 2023.