Department of Orthodontics

Last updated: October 19, 2026

Overview: The Department of Orthodontics at Okayama University is committed to cutting-edge scientific research, clinical innovation, and comprehensive postgraduate education. We integrate basic mechanistic discoveries in bone biology and biomechanics with advanced clinical evaluations to pioneer evidence-based, patient-centered orthodontic therapeutics.

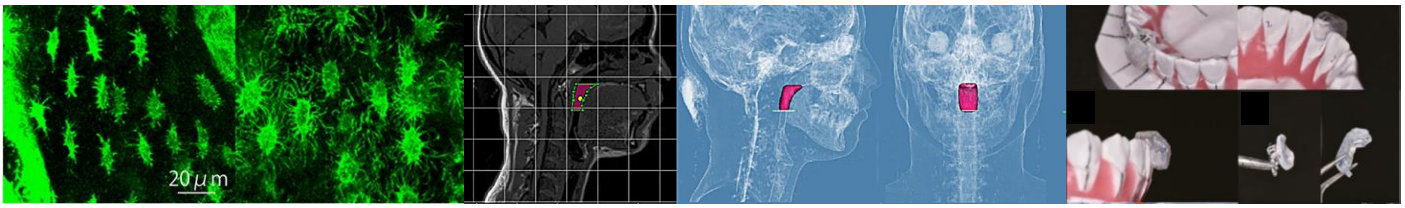
RESEARCH PORTFOLIO & KEY AREAS

BASIC RESEARCH

- **Bone Morphogenesis & Mechanotransduction**
  - Role of cell polarity in trabecular bone formation
  - Collagen network functions in bone remodeling
  - In vivo fluorescent bioimaging of mechanotransduction
  - Molecular pathways of mechanical stress on bone metabolism
  - Vagal nerve stimulation via the neuro-skeletal axis
- **Tooth Movement, Development & Pathology**
  - Novel causative genes controlling orthodontic tooth movement
  - Autophagic homeostasis during tooth movement
  - iPS cell models for congenital disease mechanisms
  - Dietary hardness impacts on craniofacial morphogenesis

CLINICAL RESEARCH

- **Craniofacial Morphology & Function**
  - Velopharyngeal insufficiency (VPI) analysis in cleft palate patients
  - MRI-based upper airway evaluation in orthodontic patients
  - Mandibular movement analysis in open bite treatment using TADs
- **Treatment Modalities & Anchorage Stability**
  - Comprehensive evaluation of Indirect Bonding Techniques
  - Long-term clinical stability of Temporary Anchorage Devices (TADs)
  - 3D digital workflow & clear aligner biomechanics



•Hashimoto M et al., Bundling of collagen fibrils influences osteocyte network formation during bone modeling. Scientific Reports, 13(1), 22028, 2023.
• Oka et al., Exploring the relationship between posture-dependent airway assessment in orthodontics: insights from kinetic MRI, cephalometric data, and three-dimensional MRI analysis. BMC Oral Health, 25(1), 745, 2025.
•Kono K et al, Comprehensive clinical evaluation of indirect and direct bonding techniques in orthodontic treatment: a single-centre, open-label, quasi-randomized controlled clinical trial. Eur J Orthod, 46(6), cjae036, 2024.

GRADUATE EDUCATION PROGRAM (Ph.D.)

A 4-year PhD program combining rigorous academic research with advanced orthodontic clinical training.

Academic & Research Training

- Independent research project execution & thesis submission
- International journal publication guidance
- Global conference presentations (WFO, AAO, JOS)



Clinical Specialization

- Intensive & General Seminars / Typodont Practice
- Multidisciplinary team care & orthognathic patient management
- Clinical competency in complex dentofacial deformities



FACULTY MEMBERS

POSITION	NAME
Professor & Chair	Hiroshi KAMIOKA
Associate Professor	Takashi IZAWA
Assistant Professor	Hirotaka UEDA
Assistant Professor	Masahiro NAKAMURA
Assistant Professor	Kana KONO
Assistant Professor	Mana HASHIMOTO
Assistant Professor	Kaori TABATA



CONTACT & ADMISSIONS INFORMATION
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