

Division of Biomaterials and Bioengineering

Department of Oral Rehabilitation

Outline

Main research focus in our department is to develop novel biomaterials and biodevices for improving the health of patients with oral and craniofacial diseases. Especially, we are investigating the surface modifications of medical and dental devices to enhance cell and tissue compatibility, and also to provide the surface with an antibacterial property using various chemical, biochemical, and physical methods. We encourage an open laboratory concept. All facilities (XPS, micro-XRD, laser-Raman, FT-IR, SEM/EDX, SPM, ICP-AES, EIS, QCM, etc.) and equipments are available for use by all researchers and graduate students in Health Sciences University of Hokkaido. Our research interests are shown below.

Faculty members

Professor; Takashi Nezu B.S., M.S., Ph.D. in Science

Senior Lecturer; Masatoshi Takahashi D.D.S., Ph.D. in Dentistry

Assistant professor; Futami Nagano-Takebe D.D.S., Ph.D. in Dentistry

Professor (Educational Supporting Center); Kazuhiko Endo B.E., M.E, Ph.D. in Dentistry & Engineering

Postgraduate students

Nastiti Sarilaksmi D.D.S.



Takashi Nezu



Masatoshi Takahashi



Futami Nagano-
Takebe



Nastiti Sarilaksmi

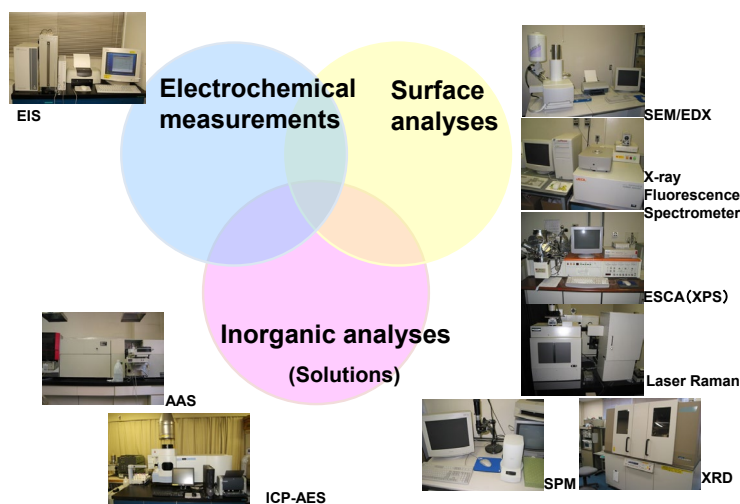


Kazuhiko Endo

Main research in progress

- 1) Chemical and physical modifications of implant surfaces for promoting desirable cell and tissue responses
- 2) Improvement of sealing and handling properties of endodontic treatment materials including MTA
- 3) Application of electrochemical techniques for evaluating the corrosion resistance of metallic biomaterials
- 4) Physico-chemical analyses of attached functional molecules on the biomaterials surface
- 5) Development of a novel medical acrylic resin coupled with biopolymers
- 6) Development of antibacterial titanium alloys for dental applications

Apparatus for instrumental analyses



Current publications

- *Takahashi M, Togawa G, Kanyi M, Ishikawa K, Takada Y. Retentive force of combined sandwich-type magnetic assemblies. *J J Mag Dent* 2023;32(2):18-22.
- *Kemuriyama S, Aita H, Maida T, Kawamura N, Nezu T, Iijima M, Endo K, Koshino H. Effect of photofunctionalization on titanium bone-implant integration in ovariectomized rats. *Dent Mater J* 2023;42(1):11-18.
- *Takahashi M, Sato K, Togawa G, Takada Y. Mechanical properties of dental cast Ti-Nb-Cu alloys for dental machining applications. *J Funct Biomater* 2022;13(4):263.
- *Takahashi M, Yamaguchi H, Takada Y. Ideal set-up angle between a pair of dental magnetic attachments for suppression of the loss in retentive force associated with horizontal displacement. *Heliyon* 2022;8(8):e10361.
- *Takahashi M, Kikuchi M, Takada Y. Grindability of Ti-Nb-Cu alloys for dental machining applications. *Metals* 2022;12(5):861.
- *Takada T, Fukuchi M, Nezu T, Nagano-Takebe F, Endo K. Evaluation of thermal conductivity and esthetic quality of denture base resin composites with acrylic polymer and nanodiamonds. *J Appl Polym Sci* 2021;138(46):e51436.
- *Ohno H, Hashimoto M, Araki Y, Nezu T, Endo K. Chemical interaction of 4-META with enamel in resin-enamel bonds. *Dent Mater J* 2021;40(3):683-688.
- *Ichioka Y, Kado T, Mashima I, Nakazawa F, Endo K, Furuichi Y. Effects of chemical treatment as an adjunctive of air-abrasive debridement on restoring the surface chemical properties and cytocompatibility of experimentally contaminated titanium surfaces. *J Biomed Mater Res B*. 2020 (Jan);180(1):183-191.
- *Kaga N, Nagano-Takebe F, Nezu T, Matsuura T, Endo K, Kaga M. Protective Effects of GIC and S-PRG Filler Restoratives on Demineralization of Bovine Enamel in Lactic Acid Solution. *Materials (Basel)*. 2020 May;13(9):2140. doi: 10.3390/ma13092140
- *Kado T, Aita H, Ichioka Y, Endo K, Furuichi Y. Chemical modification of pure titanium surfaces to enhance the cytocompatibility and differentiation of human mesenchymal stem cells. *Dent Mater J*. 2019 Nov;38(6):1026-1035.
- *Kaga N, Toshima H, Nagano-Takebe F, Hashimoto M, Nezu T, Yokoyama A, Endo K, Kaga M. Inhibition of enamel demineralization by an ion-releasing tooth-coating material. *Am J Dent*. 2019 Feb;32(1):27-32.
- *Dithi AB, Nezu T, Nagano-Takebe F, Hasan MdR, Saito T, Endo K. Application of solution plasma surface modification technology to the formation of thin hydroxyapatite film on titanium implants. *coatings*. 2019;9(1):3
- *Kawaguchi K, Iijima M, Endo K, Mizoguchi I. Electrophoretic deposition as a new bioactive glass coating process for orthodontic stainless steel. *Coatings* 7, 199-211, 2017.
- *Nezu T, Nagano-Takebe F, Endo K. Designing an antibacterial acrylic resin using the cosolvent method —Effect of ethanol on the optical and mechanical properties of a cold-cure acrylic resin, *Dent Mater J* 36, 662-668, 2017.
- *Muguruma T, Iijima M, Nagano-Takebe F, Endo K, Mizoguchi I. Frictional properties and characterization of a diamond-like carbon coating formed on orthodontic stainless steel. *J Biomater Tissu Eng* 7, 119-126, 2017.