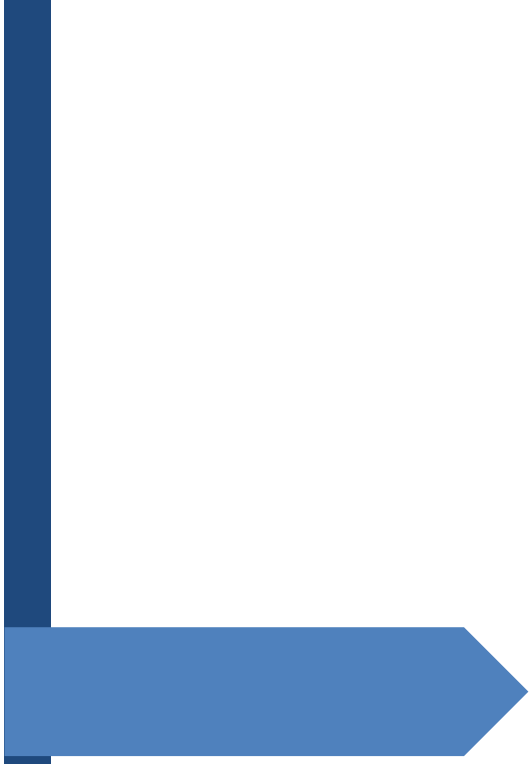


2020

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Hiroshima University Graduate  
School of Biomedical and Health  
Sciences (Dentistry) and  
Hiroshima University Hospital  
(Dental Departments)

**Research Achievements 2020**

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○ **University Hospital (Dental Departments)**

- [Division of General Dentistry, Department of General Dentistry](#)
- [Division of Oral Health and Development, Department of Oral Health](#)
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- [Central Clinical Divisions, Dental Hygiene Section](#)
- Central Clinical Divisions, Division of Medical Informatics and Systems Management
- Dental Clinic

## Department of Calcified Tissue Biology

### (1) Staff and Students

Professor: Yuji Yoshiko

Assistant Professor: Tomoko Minamizaki, Shohei Kohno (from April), Davood Kharaghani (from April),  
Tomonori Hoshino (from June)

Assistant Professor (Special Appointment): Shohei Kohno (until March)

Education and Research Support Staff: Masaaki Toshishige (until March)

Research Assistant: Rikako Nagai (until March), Atsuko Tomiyama (until September)

Graduate Student: Faisal Ahmed (until August), Sarmin Nushrat (until March), Shota Ito (Orthodontic Dentistry, until March), Masashi Nakano (Pediatric Dentistry, until March), Tomohiro Ogasawara (Orthodontic Dentistry), Shintaro Ogashira (Orthodontic Dentistry, from April), Risako Oshiro (Orthodontic Dentistry, from April)

Research Student: Sarmin Nushrat (from April to August), Parastoo Gitigard (from October)

### (2) Main Research Activities

- 1: Mineralization (including ectopic mineralization)
- 2: Osteonetwork
- 3: MicroRNAs
- 4: Bone metastasis

### (3) Research Achievements

#### A) Original Papers (including Case Reports)

- 1 : The matrix vesicle cargo miR-125b accumulates in the bone matrix, inhibiting bone resorption in mice.: Minamizaki T., Nakao Y., Irie Y., Ahmed F., Itoh S., Sarmin N., Yoshioka H., Nobukiyo A., Fujimoto C., Niida S., Sotomaru Y., Tanimoto K., Kozai K., Sugiyama T., Bonnelye E., Takei Y., Yoshiko Y.: *Commun. Biol.*, 3 (1), 30, 2000.
- 2 : Active sites of human MEPE-ASARM regulating bone matrix mineralization.: Minamizaki T., Sakurai K., Hayashi I., Toshishige M., Yoshioka H., Kozai K., Yoshiko Y.: *Mol. Cell. Endocrinol.*, 517, 110931, 2020.
- 3 :  $ERR\alpha$  Expression in Bone Metastases Leads to an Exacerbated Antitumor Immune Response.: Bouchet M., Lainé A., Boyault C., Proponnet-Guerault M., Meugnier E., Bouazza L., Kan C.W.S.,

- Geraci S., El-Moghrabi S., Hernandez-Vargas H., Benetollo C., Yoshiko Y., Duterque-Coquillaud M., Clézardin P., Marie J.C., Bonnelye E.: *Cancer Res.*, 80 (13), 2914-2926, 2020.
- 4 : The synthesis of silver-nanoparticle-anchored electrospun polyacrylonitrile nanofibers and a comparison with as-spun silver/polyacrylonitrile nanocomposite membranes upon antibacterial activity.: Phan D.N., Dorjjugder N., Saito Y., Taguchi G., Ullah A., Kharaghani D., Kim I.D.: *Polym. Bull.*, 77, 4197-4212, 2020.
- 5 : Active loading graphite/hydroxyapatite into the stable hydroxyethyl cellulose scaffold nanofibers for artificial cornea application.: Kharaghani D., Dutta D., Ho K.K.K, Zhang K.Q., Kai W., Ren X., Willcox M.D.P., Kim I.S.: *Cellulose*, 27: 3319-3334, 2020.
- 6 : Fabrication of Antibacterial Nanofibers Composites by Functionalizing the Surface of Cellulose Acetate Nanofibers.: Khan M.Q., Kharaghani D., Sanaullah, Shahzad A., Phan D.N., Hasegawa Y., Azeemullah, Jungsoon, Kim I.S.: *Chemistry Select*, 5, 1315 -1321, 2020.
- 7 : Zinc oxide nanoparticles attached to polyacrylonitrile nanofibers with hinokitiol as gluing agent for synergistic antibacterial activities and effective dye removal.: Phan D.N., Rebia R.A., Saito Y., Kharaghani D., Khatri M., Tanaka T., Lee H., Kim I.S.: *J. Ind. Eng. Chem.*, 85, 258-268, 2020.
- 8 : Fabrication and characterization of wound dressings containing gentamicin/silver for wounds in diabetes mellitus patients.: Bie X., Khan M.Q., Ullah A., Ullah S., Kharaghani D., Phan D.N., Tamada Y., Kim I.S.: *Mater. Res. Express*, 7, 045004, 2020.
- 9 : Development and characterization of composite carbon nanofibers surface-coated with ZnO/Ag nanoparticle arrays for ammonia sensor application.: Kharaghani D., Suzuki Y., Gitigard P., Ullah S., Kim I.S.: *Mater. Today Commun.*, 24, 101213, 2020.
- 10 : Bioactive Sambong oil-loaded electrospun cellulose acetate nanofibers: Preparation, characterization, and in-vitro biocompatibility.: Ullah A., Saito Y., Ullah S., Haider M.K., Nawaz H., Phan D.N., Kharaghani D., Kim I.S.: *Int. J. Biol. Macromol.*, 166, 1009-1021, 2020.
- 11 : Wet-spun bi-component alginate based hydrogel fibers: Development and in-vitro evaluation as a potential moist wound care dressing.: Umar M., Ullah A., Nawaz H., Areeb T., Hashmi M., Kharaghani D., Kim K.O., Kim I.S.: *Int. J. Biol. Macromol.*, 168, 601-610, 2020.
- 12 : 6-Deoxyjacareubin, a natural compound preventing hypoxia-induced cell death, ameliorates neurodegeneration in a mouse model of familial amyotrophic lateral sclerosis.: Hoshino T., Matsuzawa S.I., Takahashi R.: *Neurosci. Res.*, 163, 43-51, 2020.
- 13 : Susceptibility to erastin-induced ferroptosis decreases during maturation in a human oligodendrocyte cell line.: Hoshino T., Yamakado H., Takahashi R., Matsuzawa S.I.: *FEBS Open Bio*, 10 (9), 1758-1764, 2020.

## B) Review

- 1 : Emerging roles of microRNAs as extracellular vesicle cargo secreted from osteoblasts.: Yoshiko Y., Minamizaki T.: J Oral Biosci, 62 (3), 228-234, 2020.

#### C) Publications

#### D) Other Publications

#### E) Presentations at Scientific Meetings

- 1 : Overexpressing miR-125b in osteoblasts Confers a Significant Survival Benefit in Mice with Bone Metastasis : Kohno S., Sarmin N., Minamizaki T., Yoshiko Y. : The American Society for Bone and Mineral Research 2020 Annual Meeting (Web), 2020.
- 2 : Transgenic mice overexpressing miR-125b in osteoblasts ameliorate age-related changes in bone without affecting bone growth.: Ito S., Minamizaki T., Yoshiko Y.: The 125th Annual Meeting of The Japanese Association of Anatomists (Proceeding), 2020.
- 3 : Matrix vesicle-derived miR-125b accumulated in bone matrix inhibits osteolytic bone metastasis through two distinct pathways.: Kohno S., Minamizaki T., Yoshiko Y.: The 38th Annual Meeting of the Japanese Society for Bone and Mineral Research (Web), 2020.

#### F) Special lectures in academic meetings

- 1 : Regulation of bone metabolism by bone matrix miR-125b.: Minamizaki T., Yoshiko Y.: The 125th Annual Meeting of The Japanese Association of Anatomists (Proceeding), 2020.
- 2 : The role of bone matrix miR-125b in the bone microenvironment.: Minamizaki T., Yoshiko Y.: The 62nd Annual Meeting of Japanese Association for Oral Biology (Web), 2020.

#### (4) Status of Receiving Grants-in Aid for Scientific Research, etc.

- 1 : Japan Agency for Medical Research and Development, Rare/Intractable Disease Research (Continuance): Yoshiko Y., Development of a new class of anti-mineralization. 23,400,000 yen (until March)
- 2 : Grant-in-Aid for Challenging Research (Exploratory) (Continuance): Yoshiko Y., Elucidation of osteoblast fate determination by single cell analysis on mRNA-ncRNA. 18K19647. 1,800,000 yen (until March).
- 3 : Grant-in-Aid for Challenging Research (Exploratory) (Continuance): Yoshiko Y., Elucidation of osteoblast fate determination by single cell analysis on mRNA-ncRNA. 18K19647. 1,500,000 yen (from April).
- 4 : Grants-in-Aid for Scientific Research (C) (New): Minamizaki T. (Exploratory), Study of treatment

with matrix vesicles transfected with miR-125b for cancer bone metastasis. 20K09879. 1,000,000 yen (from April).

- 5 : Grants-in-Aid for Scientific Research (C) (New): Yoshiko Y. (Co-investigator), Study of treatment with matrix vesicles transfected with miR-125b for cancer bone metastasis. 20K09879. 200,000 yen (from April).
- 6 : Raffinee International Corporation (Continuance): Yoshiko Y., 2,700,000 yen

#### (5) Academic Awards, etc.

- 1 : Kohno S.: ASBMR 2020 Travel Award (The Japanese Society for Bone and Mineral Research)
- 2 : Kohno S.: JSBMR Young Investigator Award (The Japanese Society for Bone and Mineral Research)

#### (6) Patents

- 1 : Yuji Yoshiko, Tomoko Minamizaki, Masaaki Toshishige, Shohei Kohno : Peptides and inhibitors of living tissue calcification (Application #, 2020-122547) (Applicant, Hiroshima University)

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## Department of Maxillofacial Anatomy and Neuroscience

### (1) Staff and Students

Professor : Ryuji Terayama

Associate Professor: Kenta Uchibe

### (2) Main Research Activities

- 1 : Studies on nociceptive transmission of orofacial region
- 2 : Roles of glial cells in the development of neuropathic pain
- 3 : Effects of administration of drugs on neuropathic pain
- 4 : Roles of retinoic acid signaling in skeletal development
- 5 : Studies on heterotopic ossification and related diseases

### (3) Research Achievements

#### A) Original Papers (including Case Reports)

- 1 : Sumitani Y, Uchibe K, Yoshida K, Weng Y, Guo J, Yuan H, Ikegame M, Kamioka H, Okamura H, Inhibitory effect of retinoic acid receptor agonists on in vitro chondrogenic differentiation. *Anat Sci Int.* 95(2):202-208, 2020.

#### B) Review

- 1 : Terayama R, Uchibe K, Reorganization of synaptic inputs to spinal dorsal horn neurons in neuropathic pain. *Int J Neurosci.* 2020 in press.

#### C) Publications

#### D) Other Publications

#### E) Presentation at Scientific Meeting

- 1 : Terayama R, Uchibe K, Possible mechanisms for the effects of A<sub>3</sub> adenosine receptor agonist on



neuropathic pain, The 62nd Annual Meeting of Japanese Association for Oral Biology (Kagoshima), 2020.

2 : Uchibe K, Terayama R, Roles of retinoic acid signaling in chondrocytes, The 62nd Annual Meeting of Japanese Association for Oral Biology (Kagoshima), 2020.

(4) Status of Receiving Grants-in Aid for Scientific Research, etc.

1 : Grant-in Aid-for Scientific Research (C): Ryuji Terayama, 19K10042, ¥1,430,000

(5) Academic Awards, etc.

(6) Patents

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## Department of Physiology and Oral Physiology

### (1) Staffs and Students

Professor : SUGITA, Makoto

Assistant Professor : SAKAYORI, Nobuyuki

Assistant Professor : KITAGAWA, Michinori (~2020.10)

Graduate Students : YAMAMOTO, Kuniyo

### (2) Main Research Activities

- 1 : The molecular and cellular bases of taste perception and coding
- 2 : The neuronal mechanisms underlying the taste-evoked behavioral and emotional responses
- 3 : The roles of essential fatty acids in brain development and feeding behaviors
- 4 : The molecular mechanisms of ion and fluid transport in salivary glands
- 5 : The molecular mechanisms in development, morphogenesis and functional maintenance of salivary glands and oral tissues
- 6 : Studies on the function and dysfunction of ion channels and transporters

### (3) Research Achievements

#### A) Original Papers (including Case Reports)

- 1 : Maternal dietary imbalance between omega-6 and omega-3 fatty acids triggers the offspring's overeating in mice : Sakayori N., Katakura M., Hamazaki K., Higuchi O., Fujii K., Fukabori R., Iguchi Y., Setogawa S., Takao K., Miyazawa T., Arita M., Kobayashi K. : *Commun. Biol.*, 3, 473, 2020.
- 2 : Dmrt genes participate in the development of Cajal-Retzius cells derived from the cortical hem in the telencephalon : Kikkawa T., Sakayori N., Yuuki H., Katsuyama Y., Matsuzaki F., Konno D., Abe T., Kiyonari H., Osumi N. : *Dev. Dyn.*, 249, 698-710, 2020.

#### B) Review

#### C) Publications

#### D) Other publication

## E) Presentation at Scientific Meeting

- 1 : Genetic tracing-based characterization of bitter-taste relaying neurons in the parabrachial nuclei : Sugita M. : The 62th Annual Meeting of Japanese Association for Oral Biology (online), 2020.
- 2 : The role of sodium-glucose cotransporter-1 in maintaining Cl<sup>-</sup> secretion that drives fluid secretion from salivary glands : Sugita M., Takeyasu M., Terachi M., Kozai K. : 2020 NIPS Research Meeting (online), 2020.
- 3 : Maternal dietary imbalance in essential fatty acids induces hedonic feeding in offspring : Sakayori N., Kobayashi K. : The 53rd Annual Meeting of the Japan Society of Nutrition and Food Science, Chugoku-Shikoku Division (online), 2020.
- 4 : The roles of essential fatty acids in dopaminergic neurogenesis and dopamine-dependent ingestive behaviors : Sakayori N., Kobayashi K. : The 93rd Annual Meeting of the Japanese Biochemical Society (online), 2020.
- 5 : The roles of brain essential fatty acids in hedonic feeding behaviors : Sakayori N., Kobayashi K. : The 5th Study Section for Preference and Appetite for Food (online), 2020.
- 6 : Maternal dietary imbalance in essential fatty acids induces dopamine-dependent feeding in offspring : Sakayori N., Kobayashi K. : The 29th Annual Meeting of the Japan Society for Lipid Nutrition (online), 2020.
- 7 : Lipid molecules to produce willpower and its dysregulation by modern diets : Sakayori N. : The 1st Meeting of the Will Dynamics 2020 (online), 2020.
- 8 : The roles of brain essential fatty acids in dopamine-dependent ingestive behaviors : Sakayori N., Kobayashi K. : The 43rd Annual Meeting of the Japan Neuroscience Society (online), 2020.

## (4) Status of Receiving Grants-in Aid for Scientific Research, etc.

- 1 : Grant-in-Aid for Scientific Research (C): Sugita M., The functional mapping of taste information processing in the brain by using genetic tracing. 18K09519. ¥1,200,000.
- 2 : Grant-in-Aid for Young Scientists: Sakayori N., The roles of dietary essential fatty acids in anxiety-related behaviors. 19K20184. ¥1,600,000
- 3 : Grant-in-Aid for Scientific Research on Innovative Areas: Sakayori N., Lipid molecules to produce will-power and its dysregulation by modern diets. 19H05023. ¥2,900,000

## (5) Academic Awards, etc.

- 1 : Sakayori N.: Support for Behavioral Analysis, Support for Physiological Analysis, Platforms for Advanced Technologies and Research Resources, Grant-in-Aid for Scientific Research on Innovative

Areas

(6) Patents

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## Department of Molecular Biology and Biochemistry

### (1) Staff and Students

Professor: Chisa Shukunami

Assistant Professor: Katsumi Fujimoto, Shinnosuke Higuchi

Research Student: Xinyi Yu

Undergraduate Student: Shinsei Yambe, Kenji Nakatsuji, Nanami Miyake, Satoshi Miwa

### (2) Main Research Activities

- 1 : Mechanisms regulating in the establishment of the junction between cartilage and tendon/ligament
- 2 : The role of Pax1 during formation of vertebral column
- 3 : Mechanisms of tendon/ligament formation
- 4 : Mechanisms of periodontal ligaments formation
- 5 : Mechanisms regulating differentiation of dental pulp stem cells
- 6 : Morphogenesis of the head and neck region

### (3) Research Achievements

#### A) Original Papers (including Case Reports)

- 1 : Loss of tenomodulin expression is a risk factor for age-related intervertebral disc degeneration.: Lin D, Alberton P, Delgado Caceres M, Prein C, Clausen-Schaumann H, Dong J, Aszodi A, Shukunami C, Iatridis JC, Docheva D.: *Aging Cell*, 19(3), e13091, 2020.
- 2 : Kuriki M, Sato F, Arai HN, Sogabe M, Kaneko M, Kiyonari H, Kawakami K, Yoshimoto Y, Shukunami C, Sehara-Fujisawa A: *Development*, 147(9), dev186239, 2020.
- 3 : Role of Scx<sup>+</sup>/Sox9<sup>+</sup> cells as potential progenitor cells for postnatal supraspinatus enthesis formation and healing after injury in mice.: Ideo K, Tokunaga T, Shukunami C, Takimoto A, Yoshimoto Y, Yonemitsu R, Karasugi T, Mizuta H, Hiraki Y, Miyamoto T.: *PLoS One*, 15(12), e0242286, 2020.
- 4 : DEC1 regulates the rhythmic expression of PPAR $\gamma$  target genes involved in lipid metabolism in white adipose tissue.: Noshiro M, Kawamoto T, Nakashima A, Ozaki N, Saeki M, Honda K, Fujimoto K, Kato Y.: *Genes Cells*, 25(4), 232–241, 2020.
- 5 : Novel developmental bases for the evolution of hypobranchial muscles in vertebrates.: Kusakabe R, Higuchi S, Tanaka M, Kadota M, Nishimura O, Kuratani S.: *BMC Biol*, 18(1), 120, 2020.

## B) Review

- 1 : Frontiers of Tendon and Ligament Research “Recent progress in tendon/ligament research”: Chisa Shukunami: Orthopaedic Surgery and Traumatology 63 (1), 83–88, 2020.
- 2 : Frontiers of Tendon and Ligament Research (5) “Specific molecular markers of tendons and ligaments”: Yuriko Nishimura, Chisa Shukunami: Surgery and Traumatology 63 (6), 833–838, 2020.
- 3 : Frontiers of Tendon and Ligament Research (11) “Formation and homeostasis of the intervertebral disc: Shigenori Miura, Chisa Shukunami: Surgery and Traumatology 63 (12), 1685–1689, 2020.

## C) Publications

## D) Other Publications

## E) Presentation at Scientific Meeting

- 1 : Regionality of intracardiac neural crest cells with diversity and differentiation fate mechanism revealed by single cell and spatial transcriptome analysis : Akiyasu Iwase, Yasunobu Uchijima, Daiki Seya, Mayuko Kida, Kazuhiro Matsui, Akashi Taguchi, Shogo Yamamoto, Shiro Fukuda, Seitaro Nomura, Takahide Kohro, Chisa Shukunami, Masahide Seki, Yutaka Suzuki, Youichiro Wada, Hiroyuki Aburatani, Yukiko Kurihara, Sachiko Miyagawa-Tomita, Hiroki Kurihara : The 43rd Annual Meeting of the Molecular Biology Society of Japan, 2020.
- 2 : Heterogeneity and regionality of intracardiac neural crest cells revealed by single cell and spatial transcriptome analysis : Akiyasu Iwase, Yasunobu Uchijima, Daiki Seya, Mayuko Kida, Hiroki Higashiyama, Kazuhiro Matsui, Akashi Taguchi, Shogo Yamamoto, Shiro Fukuda, Seitaro Nomura, Takahide Kohro, Chisa Shukunami, Masahide Seki, Yutaka Suzuki, Youichiro Wada, Hiroyuki Aburatani, Yukiko Kurihara, Sachiko Miyagawa-Tomita, Hiroki Kurihara : The 19th Annual Meeting of Japan Cardiovascular Development Study Group, 2020.
- 3 : Establishment of in vitro tenogenic/ligamentogenic differentiation system using *ScxGFP* iPSCs : Yuki Yoshimoto, Tamaki Kurosawa, Heying Zhou, Madoka Ikemoto-Uezumi, Yuske Sotomaru Chisa Shukunami, Akiyoshi Uezumi : The 6th Annual Meeting of Japan Muscle Society, 2020.
- 4 : Genetic markers for predicting adipogenic differentiation potential of bone marrow-derived mesenchymal stromal cells: Masami Kanawa, Akira Igarashi, Katsumi Fujimoto, Yukihito Higashi, Hidemi Kurihara, Yukio Kato, Takeshi Kawamoto: The 43rd Annual Meeting of the Molecular Biology Society of Japan, 2020.

## F) Special lectures in academic meetings

- 1 : Establishment of an *in vitro* culture system for tenogenic/ligamentogenic differentiation using ScxGFP iPS cells: Chisa Shukunami: The 68th Annual Meeting of Japanese Association for Dental Research, 2020.
- 2 : Functional roles of Scx and Sox9 in the integration of the components of the musculoskeletal system: Chisa Shukunami: The 43rd Annual Meeting of the Molecular Biology Society of Japan, 2020.

## (4) Status of Receiving Grants-in Aid for Scientific Research, etc.

- 1 : Grant-in-Aid for Scientific Research (B): Chisa Shukunami (Principal Investigator), 18H02966. ¥2,800,000.
- 2 : Grant-in-Aid for Scientific Research (B): Chisa Shukunami (Co-Investigator), 20H03805. ¥400,000.
- 3 : Grant-in-Aid for Challenging Research (Exploratory): Chisa Shukunami (Co-Investigator), 19K22954. ¥100,000.
- 4 : Grant-in-Aid for Scientific Research (C): Katsumi Fujimoto (Principal Investigator), 18K09638. ¥800,000.
- 5 : Grant-in-Aid for Scientific Research (C): Katsumi Fujimoto (Co-Investigator), 19K08710. ¥100,000.
- 6 : Grant-in-Aid for Research Activity Start-up: Shinnosuke Higuchi (Principal Investigator), 19K23752. ¥1,430,000.
- 7 : Grant-in-Aid for Early-Career Scientists: Shinnosuke Higuchi (Principal Investigator), 20K15830. ¥1,690,000.
- 8 : The Sumitomo Foundation, Grant for Basic Science Research Projects: Shinnosuke Higuchi, ¥1,400,000.
- 9 : The Uehara Memorial Foundation, Research Grant: Shinnosuke Higuchi, ¥2,000,000.

## (5) Academic Awards, etc.

## (6) Patents

## Department of Oral and Maxillofacial Pathobiology

### (1) Staffs and Students

Professor : Mutsumi Miyauchi

Assistant Professor : Hisako Furusho

Graduate Student : Eri Ishida (D3, Department of Advanced Prosthodontics)  
Kanae Oda (D2) (Department of Orthodontics)

### (2) Main Research Activities

- 1: Study on correlation between periodontitis and preterm birth/ low birth weight
- 2: Development of prognostic/diagnostic examination system of preterm birth targeting serum Galectin-3
- 3: Collaborative study on correlation between odontogenic infection and NASH
- 4: Collaborative study on correlation between odontogenic infection and brain diseases
- 5: Collaborative study on correlation between odontogenic infection and atrial fibrillation
- 6: Regulation of bone destructive disease using lactoferrin peptides
- 7: Development of diagnosis/inspection system using expiratory air
- 8: Epidemiological study on the relationship between periodontal disease and systemic diseases using large-scale data of Hiroshima Branch of National Health Insurance Society

### (3) Research Achievements

#### A) Original Papers (including Case Reports)

1. Odontogenic infection by *Porphyromonas gingivalis* exacerbates fibrosis in NASH via hepatic stellate cell activation: Nagasaki A, Sakamoto S, Chea C, Ishida E, Furusho H, Fujii M, Takata T, Miyauchi M: Sci Rep. 2020; 10: 4134. Published online 2020 Mar 5. doi: 10.1038/s41598-020-60904-8.
2. Bovine lactoferrin enhances osteogenesis through Smad2/3 and p38 MAPK activation: Inubushi T, Kosai A, Yanagisawa S, Chanbora C, Miyauchi M, Yamasaki S, Sugiyama E, Ishikado A, Makino T,



- Takata T: J Oral Biosci. 2020 Jun;62(2):147-154. doi: 10.1016/j.job.2020.05.001.
3. Immunomodulation Mediated by Azithromycin in Experimental Periapical Inflammation: Andrada AC, Azuma MM, Furusho H, Hirai K, Xu S, White RR, Sasaki H: J Endod. 2020 Aug 5:S0099 2399(20) 30574-4. doi: 10.1016/j.joen.2020.07.028.
  4. *Porphyromonas gingivalis*, a cause of preterm birth in mice, induces an inflammatory response in human amnion mesenchymal cells but not epithelial cells: Konishi H, Urabe S, Teraoka Y, Morishita Y, Koh I, Sugimoto J, Sakamoto S, Miyoshi H, Miyauchi M, Takata T, Kajioka S, Kudo Y: Placenta. 2020 Sep 15;99:21-26. doi: 10.1016/j.placenta.2020.07.016.
  5. Anti-inflammatory effect of glycyrrhizin with Equisetum arvense extract: Shiba F, Miyauchi M, Chea C, Furusho H, Iwasaki S, Shimizu R, Ohta K, Nishihara T, Takata T: Odontology. 2020 Nov 3. doi: 10.1007/s10266-020-00563-3.
  6. Senescent hepatic stellate cells caused by deoxycholic acid modulates malignant behavior of hepatocellular carcinoma: Nguyen PT, Kanno K, Pham QT, Kikuchi Y, Kakimoto M, Kobayashi T, Otani Y, Kishikawa N, Miyauchi M, Arihiro K, Ito M, Tazuma S: J Cancer Res Clin Oncol. 2020 Dec;146(12):3255-3268. doi: 10.1007/s00432-020-03374-9.

## B) Reviews

## C) Publications

## E) Presentation at Scientific Meeting

### 1) Special lectures in academic meetings

### 2) Presentation at International Scientific Meeting

### 3) Presentation at Domestic Scientific Meeting

1. *P. gingivalis*-odontogenic infection promotes development of NASH-Related HCC via Integrin Signaling: Sakamoto S, Miyauchi M. : The 79<sup>th</sup> Annual Meeting of the Japanese Cancer Association (Hiroshima), 2020.
2. *Porphyromonas gingivalis*-odontogenic infection promotes development of NASH-related HCC : Sakamoto S, Miyauchi M.: The 59<sup>th</sup> Meeting of Hiroshima Prefectural Dental Association/ The 104<sup>th</sup> Meeting of Hiroshima University Dental Society (Hiroshima), 2020.

3. Rapid detection of the *Porphyromonas gingivalis* fimA genotypes II and IV by loop-mediated isothermal amplification: Kitagawa M, Ouhara K, Miyauchi M, Nagamine K, Shiba H: The joint meeting of the 33<sup>rd</sup> Annual Meeting of Japanese Society of Oral Diagnosis/Oral Medicine, the 30<sup>th</sup> Annual Meeting of Japanese Society of Oral Medicine and the 13<sup>th</sup> Annual Meeting of Japanese Society for Evidence and the Dental Professional (Tokyo), 2020.

#### 4) Case report

1. Mesenchymal chondrosarcoma: Sakamoto S, Furusho H, Ono S, Nakamoto T, Miyauchi M, Hirose T, Ogawa I: The 109<sup>th</sup> Annual Meeting of the Japanese Society of Pathology (Hakata), 2020.
2. Ghost cell odontogenic carcinoma arising in dentinogenic ghost cell tumor, peripheral: Sakamoto S, Ando T, Mizuta K, Ishida F, Kato D, Ono S, Konishi M, Miyauchi M, Ogawa I: The 31<sup>st</sup> Annual Meeting of the Japanese Society for Oral Pathology (Nagoya), 2020.
3. Odontogenic fibroma, amyloid variant: Sakamoto S, Ando T, Kanda T, Sueti Y, Nishida T, Ogawa I, Miyauchi M: 133<sup>rd</sup> Academic Meeting of Chugoku-Shikoku Branch of the Japanese Society of Pathology (Hiroshima), 2020.
4. Additional report: Lymphadenoma, non-sebaceous type with CRTC1-MAML2 fusion gene: Ogawa I, Sakamoto S, Ohbayashi M, Miyauchi M, Fujihara M: 131<sup>st</sup> Academic Meeting of Chugoku-Shikoku Branch of the Japanese Society of Pathology (Okayama), 2020.

#### (4) Status of Receiving Grants-in Aid for Scientific Research

1. Grants-in-Aid for Scientific Research (Scientific Research(C)): Hisako Furusho (Principal Investigator, Continuance), Role of TLR2 in preterm birth caused by *P.gingivalis* dental infection.
2. Grants-in-Aid for Scientific Research (Scientific Research(B)): Mutsumi Miyauchi (Co-Investigator, New), Research on AI diagnosis and biological basis of multiple diseases by breath gas sensing.
3. Grants-in-Aid for Scientific Research (Scientific Research(C)): Mutsumi Miyauchi (Co-Investigator, Continuance), Role of TLR2 in preterm birth caused by *P.gingivalis* dental infection.
4. Grants-in-Aid for Scientific Research (Scientific Research(C)): Mutsumi Miyauchi, Hisako Furusho (Co-Investigator, Continuance), Study on preterm birth prevention and anti-inflammatory effects of luteal hormones using odontogenic infection induced preterm birth mouse model.
5. Grants-in-Aid for Scientific Research (Scientific Research(C)): Mutsumi Miyauchi (Co-Investigator,

- Continuance), Development and deployment of an age estimation method for Asian people using DNA methylation as an indicator.
6. Grants-in-Aid for Scientific Research (Scientific Research(C)); Mutsumi Miyauchi (Co-Investigator, New), Establishment of rapid detection system for systemic disease-related oral bacterial genes - applying detection system of cnm-positive S. mutans to clinical study-
  7. Collaborative research fund from Cortexyme Co. Ltd. (New): Mutsumi Miyauchi (Study on oral systemic disease connection)
  8. Donated fund from Earth Co. (New): Mutsumi Miyauchi
  9. Collaborative research fund from Earth Co. (Continuance): Mutsumi Miyauchi (Study on effect of mouse wash)
  10. Donated fund for Hiroshima Prefecture tumor registration business (Continuance): Mutsumi Miyauchi (Study on oral diseases)
  11. Donated fund from Mitsubishi-Mihara Hospital (Continuance): Mutsumi Miyauchi (Study on diagnosis for oral disease)

#### (5) Academic Awards

1. Shiiko Maegawara          Hiroshima University President Award

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## Department of Bacteriology

### (1) Staff and Students

Professor: Name: Hitoshi Komatsuzawa

Associate Professor: Miki Matsuo (from Mar, 2020)

Researcher: Chika Arai

Keiko Tsuruda (from April, 2020)

LE NGUYEN TRA MI (from October, 2020)

### (2) Main Research Activities

- 1 : Analysis of oral microbiome formation
- 2 : Analysis of virulence and antibiotic resistance of oral bacteria
- 3 : Isolation and characterization of drug resistant bacteria
- 4 : Analysis of virulence and drug resistance in *Staphylococcus aureus*
- 5 : Identification of novel antibacterial agents

### (3) Research Achievements

#### A) Original Papers (including Case Reports)

1. *Staphylococcus aureus* Virulence Affected by an Alternative Nisin A Resistance Mechanism., Kawada-Matsuo M, Watanabe A, Arai K, Oogai Y, Noguchi K, Miyawaki S, Hayashi T, Komatsuzawa H., Appl Environ Microbiol. 2020 Apr 1;86(8): e02923-19.
2. Antibacterial activity of phellodendron bark against *Streptococcus mutans*., Tsujii T, Kawada-Matsuo M, Migita H, Ohta K, Oogai Y, Yamasaki Y, Komatsuzawa H., Microbiol Immunol. 2020 Jun;64(6): 424-434.
3. Rapid detection of the *Streptococcus mutans* *cnm* gene by loop-mediated isothermal amplification., Kitagawa M, Nagamine K, Oka H, Ouhara K, Ogawa I, Komatsuzawa H, Kurihara H., Anal Biochem. 2020 Sep 15;605:113812.
4. Oral colonisation by antimicrobial-resistant Gram-negative bacteria among long-term care facility residents: prevalence, risk factors, and molecular epidemiology., Le MN, Kayama S, Yoshikawa M, Hara T, Kashiya S, Hisatsune J, Tsuruda K, Onodera M, Ohge H, Tsuga Kazuhiro, Sugai M., Antimicrob Resist Infect Control. 2020 Mar 4;9:45.
5. The impact of fixed orthodontics appliances on oral microbiome dynamics in Japanese patients., Kado I, Hisatsune J, Tsuruda K, Tanimoto K, Sugai M., Sci Rep. 2020 Dec; 10: 21989.

## B) Review

## C) Publications

- 1 : Oral Microbiology and Immunology: Hitoshi Komatsuzawa : Ishiyaku Publishers,Inc. (Tokyo) 198-199, 210-230, 278-282, 2020.
- 2 : Oral Microbiology and Immunology: Miki Matsuo : Ishiyaku Publishers,Inc. (Tokyo) 278-282, 2020.
- 3 : Text for Dental Hygienist Microbiology: Hitoshi Komatsuzawa : Ishiyaku Publishers,Inc. (Tokyo) 110-121, 144-153, 157-177, 2015.

## E) Presentations at Scientific Meetings

- 1 : Skillful survival strategies with TCSs of commensal bacteria against antimicrobial peptides : Miki Kawada-Matsuo, Hitoshi Komatsuzawa, 93th Annual Meeting of Japanese Society for Bacteriology (Nagoya), 2020.
- 2 : Oral Carriage of AMR Bacteria in a Long Term Care Facility's Residents - Prevalence and Risk Factors : Le Nguyen Tra Mi, 94th Annual Meeting of the Japanese Association for Infectious Diseases (Tokyo), 2020.
- 3: Participant survey in dental hygienist reinstatement / turnover prevention support and new employee support program: Keiko Tsuruta, Yuko Kurawaki, Reiko Aimi, Keiko Misumi, Kotomi Tetsumori, Ayumi Oue, Rumi Nishimura, Atsue Matsumoto, Mariko Naito, Toshinobu Takemoto : Published in the 31st Kinki / Chugoku / Shikoku Oral Hygiene Society (Okayama), 2020.

## (4) Status of Receiving Grants-in Aid for Scientific Research, etc.

- 1 : Miki Matsuo, Grants-in-Aid for Scientific Research (B) from the Ministry of Education, Culture, Sports, Sciences, and Technology of Japan., Analysis of natural prebiotic factors for the inhibition of Staphylococcus aureus infection to oral cavity., Grant No: 18K09553, 800 千円
- 2 : Challenging sprouting (sprouting) from the Ministry of Education, Culture, Sports, Sciences, and Technology of Japan., Hitoshi Komatsuzawa, Establishment of new caries prevention method using bacteriophage, Grant No: 20K21680, 2200 千円

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## Department of Cellular and Molecular Pharmacology

### (1) Staff and Students

Professor: Yukio Ago

Assistant Professor: Satoshi Asano

Graduate Student: Eiji Imado (D2, Dental Anesthesiology)

Research Student: Mitsuki Nishimoto (B6), Shun-ichiro Nakayama (B4), Daichi Koan (B4),

Misa Yamaksaka (B4), Yoshiaki Yokoyama (B4)

### (2) Main Research Activities

- 1: Studies on the mechanisms of action of the drugs in depression, schizophrenia, anxiety, and neurodegenerative diseases.
- 2: Studies on the roles of gene-environment interactions in brain development.
- 3: Studies on the roles of cell migration, adhesion, and proliferation in biological and pathological processes.

### (3) Research Achievements

#### A) Original Papers

- 1: Matsumura K, Seiriki K, Okada S, Nagase M, Ayabe S, Yamada I, Furuse T, Shibuya H, Yasuda Y, Yamamori H, Fujimoto M, Nagayasu K, Yamamoto K, Kitagawa K, Miura H, Gotoda-Nishimura N, Igarashi H, Hayashida M, Baba M, Kondo M, Hasebe S, Ueshima K, Kasai A, Ago Y, Hayata-Takano A, Shintani N, Iguchi T, Sato M, Yamaguchi S, Tamura M, Wakana S, Yoshiki A, Watabe AM, Okano H, Takuma K, Hashimoto R, Hashimoto H, Nakazawa T. Pathogenic POGZ mutation causes impaired cortical development and reversible autism-like phenotypes. *Nat Commun* 11(1): 859, 2020.
- 2: Otani S, Miki S, Nakamura Y, Ishimoto K, Ago Y, Nakagawa S. Improved bioavailability of  $\beta$ -carotene by amorphous solid dispersion technology in rats. *J Nutr Sci Vitaminol* 66(2): 207-210, 2020.
- 3: Xie Z, Ikegami T, Ago Y, Okada N, Tachibana M. Valproic acid attenuates CCR2-dependent tumor infiltration of monocytic myeloid-derived suppressor cells, limiting tumor progression. *OncoImmunology* 9(1): 1734268, 2020.
- 4: Yokoyama R, Higuchi M, Tanabe W, Tsukada S, Naito M, Yamaguchi T, Chen L, Kasai A, Seiriki K, Nakazawa T, Nakagawa S, Hashimoto K, Hashimoto H, Ago Y. (*S*)-Norketamine and (*2S,6S*)-hydroxynorketamine exert potent antidepressant-like effects in a chronic corticosterone-induced mouse

model of depression. *Pharmacol Biochem Behav* 191: 172876, 2020.

- 5: Tanuma M, Kasai A, Bando K, Kotoku N, Harada K, Minoshima M, Higashino K, Kimishima A, Arai M, Ago Y, Seiriki K, Kikuchi K, Kawata S, Fujita K, Hashimoto H. Direct visualization of an antidepressant analog using surface-enhanced Raman scattering in the brain. *JCI Insight* 5(6): 133348, 2020.
- 6: Takeuchi S, Kawanai T, Yamauchi R, Chen L, Miyaoka T, Yamada M, Asano S, Hayata-Takano A, Nakazawa T, Yano K, Horiguchi N, Nakagawa S, Takuma K, Waschek JA, Hashimoto H, Ago Y. Activation of the VPAC2 receptor impairs axon outgrowth and decreases dendritic arborization in mouse cortical neurons by a PKA-dependent mechanism. *Front Neurosci* 14: 521, 2020.
- 7: Kawaguchi C, Shintani N, Hayata-Takano A, Hatanaka M, Kuromi A, Nakamura R, Yamano Y, Shintani Y, Nagai K, Tsuchiya S, Sugimoto Y, Ichikawa A, Okuno Y, Urade Y, Hirai H, Nagata KY, Nakamura M, Narumiya S, Nakazawa T, Kasai A, Ago Y, Takuma K, Baba A, Hashimoto H. Lipocalin-type prostaglandin D synthase regulates light-induced phase advance of the central circadian rhythm in mice. *Commun Biol* 3(1): 557, 2020.

## B) Review

- 1: Yukio Ago. The Role of Genetic and Environmental Factors in Neuropsychiatric Disorders. *J Hiroshima Univ Dent Soc* 52(2): 55-61, 2020.

## C) Publications

- 1: Atsuko Hayata, Yukio Ago, Hitoshi Hashimoto. Research aimed at elucidating the molecular mechanism for stress-related psychiatric disorders and the development of therapeutic drug through PACAP signaling. *Medical Science Digest (The New Science Co., Ltd. Tokyo, Japan)* 46(6): 54-57, 2020.

## D) Other Publications

None

## E) Presentations at Scientific Meetings

International conference

- 1: Yukio Ago, Lu Chen, Atsuko Hayata-Takano, Takanobu Nakazawa, Shinsaku Nakagawa, Hitoshi

Hashimoto. Modeling VIPR2 Linkages to Schizophrenia in Mice and Discovering Antipsychotic Medications. The 10th Takeda Science Foundation Symposium on PharmaSciences, Osaka, January 24-25, 2020.

- 2: Zhiqi Xie, Yukio Ago, Naoki Okada, Masashi Tachibana. Epigenetic modulation with valproic acid impedes invasion of monocytic myeloid-derived suppressor cells into tumors. The 27th International Symposium on Molecular Cell Biology of Macrophages (MMCB2020), Osaka, June 16-17, 2020.

#### Domestic conference

- 1: Rei Yokoyama, Yukio Ago, Momoko Higuchi, Wataru Tanabe, Shinji Tukada, Atsushi Kasai, Kaoru Seiriki, Takanobu Nakazawa, Kenji Hashimoto, Hitoshi Hashimoto. Differential effects of ketamine metabolites on depression-like behaviors induced by chronic corticosterone injection in mice. The 93rd Annual Meeting of the Japanese Pharmacological Society, Magazine, 16-18 March, 2020.
- 2: Masayuki Baba, Kazumasa Yokoyama, Kaoru Seiriki, Kensuke Matsumura, Momoka Kondo, Kana Yamamoto, Atsushi Kasai, Yukio Ago, Kazuki Nagayasu, Atsuko Hayata, Shun Yamaguchi, Daisuke Mori, Norio Ozaki, Tadashi Yamamoto, Kazuhiro Takuma, Ryota Hashimoto, Hitoshi Hashimoto, Takanobu Nakazawa. Psychiatric-disorder-related behavioral phenotypes and cortical hyperactivity in a mouse model of 3q29 deletion syndrome. The 93rd Annual Meeting of the Japanese Pharmacological Society, Magazine, 16-18 March, 2020.
- 3: Tamami Ikegami, Yukio Ago, Shinji Tsukada, Kohei Tanibayashi, Naoki Okada, Masashi Tachibana. Analysis of myeloid-derived suppressor cells in depression. The 140th Annual Meeting of the Pharmaceutical Society for Japan, Magazine, 25-28 March, 2020.
- 4: Zhiqi Xie, Tamami Ikegami, Yukio Ago, Naoki Okada, Masashi Tachibana. Valproic acid reduces tumor-infiltrating monocytic myeloid-derived suppressor cells and increases the efficacy of anti-PD-1 therapy. The 140th Annual Meeting of the Pharmaceutical Society for Japan, Magazine, 25-28 March, 2020.
- 5: Taiki Iwamoto, Shuichi Otani, Kenji Ishimoto, Yukio Ago, Shinsaku Nakagawa. Solubility and gastrointestinal absorption of amorphous silibinin for the development of functional foods. The 35th Annual Meeting of The Academy of Pharmaceutical Science and Technology, Magazine, 14-16 May, 2020.
- 6: Zhiqi Xie, Tamami Ikegami, Yukio Ago, Naoki Okada, Masashi Tachibana. Targeting myeloid-derived suppressor cells with valproic acid improves the efficacy of anti-PD-1 immunotherapy. The 35th Annual Meeting of The Academy of Pharmaceutical Science and Technology, Magazine, 14-16 May, 2020.
- 7: Lu Chen, Shuto Takeuchi, Mei Yamada, Tatsunori Miyaoka, Takumi Yamaguchi, Takanobu Nakazawa, Shinsaku Nakagawa, Hitoshi Hashimoto, Yukio Ago. Behavioral and morphological abnormalities in a mouse model with copy number variation of the vasoactive intestinal peptide receptor VIPR2 gene. The



137th Kinki Branch Meeting of the Japanese Pharmacological Society, Online, 20 June, 2020.

- 8: Takumi Yamaguchi, Yukio Ago, Ryota Yamaguchi, Akane Ohno, Yukiko Shimada, Kenji Ishimoto, Shuichi Otani, Shinsaku Nakagaw. Naringenin Amorphous solid dispersion promotes acetylcholine neurotransmission in the brain and improves cognitive deficits. The 36th Annual Meeting of the Japan Society of Drug Delivery System, Kobe, 28-29 August, 2020.
- 9: Masayuki Baba, Kaoru Seiriki, Momoka Kondo, Kohei Kitagawa, Tomoya Takemoto, Atsushi Kasai, Yukio Ago, Kazuki Nagayasu, Daisuke Mori, Norio Ozaki, Tadashi Yamamoto, Kazuhiro Takuma, Ryota Hashimoto, Hitoshi Hashimoto, Takanobu Nakazawa. Molecular research for pathology of psychiatric disorders by using a mouse model of 3q29 deletion syndrome. The 138th Kinki Branch Meeting of the Japanese Pharmacological Society, Online, 14 November, 2020.

#### F) Symposium, Special lectures in academic meetings, etc.

- 1: Yukio Ago, Kenji Ishimoto, Shuichi Otani, Shinsaku Nakagawa. Symposium: Improvement by amorphous solid dispersion technology of water solubility and cognitive-enhancing effect of naringenin. The 140th Annual Meeting of the Pharmaceutical Society for Japan, Magazine, 25-28 March, 2020.
- 2: Yukio Ago. Symposium: We make the Future. The 2020 Joint Annual Meeting of the 50th Annual Meeting of Japanese Society of Neuropsychopharmacology, 42nd Annual Meeting of Japanese Society of Biological Psychiatry & 4th Annual Meeting of Japanese Society of Psychiatric Pharmacy (NPBPPP2020), Online, 21-23 August, 2020.
- 3: Kazuhiro Takuma, Yuta Hara, Yukio Ago, Hitoshi Hashimoto, Takanobu Nakazawa, Toshio Matsuda. Symposium: The contribution of prenatal drug exposure to the etiology of autism spectrum disorder. The 2020 Joint Annual Meeting of the 50th Annual Meeting of Japanese Society of Neuropsychopharmacology, 42nd Annual Meeting of Japanese Society of Biological Psychiatry & 4th Annual Meeting of Japanese Society of Psychiatric Pharmacy (NPBPPP2020), Online, 21-23 August, 2020.
- 4: Yukio Ago. Symposium: Molecular basis and drug discovery strategy for schizophrenia by focusing on rare variants. The 163rd Meeting of the Japanese Society of Veterinary Science, Online/Website, 14-30 September, 2020.
- 5: Yukio Ago. Special lecture: How Drugs Affect the Brain and Mind. Graduate School of Tokyo University of Agriculture, Online, 25 November, 2020.

#### (4) Status of Receiving Grants-in Aid for Scientific Research, etc.

- 1: Strategic Research Program for Brain Sciences from Japan Agency for Medical Research and Development (AMED): Yukio Ago (Co-Investigator, Continuance), Grant Number:

20dm0107122s0105

- 2: Grant-in-Aid for Scientific Research (B) from Japan Society for the Promotion of Science (JSPS): Yukio Ago (Principal Investigator, New), Grant Number: 20H03392
- 3: Grant-in-Aid for Scientific Research (B) from Japan Society for the Promotion of Science (JSPS): Yukio Ago (Co-Investigator, New), Grant Number: 20H03404
- 4: Grant-in-Aid for Scientific Research (B) from Japan Society for the Promotion of Science (JSPS): Yukio Ago (Co-Investigator, New), Grant Number: 20H03429
- 5: Grant-in-Aid for Scientific Research (C) from Japan Society for the Promotion of Science (JSPS): Satoshi Asano (Principal Investigator, New), Grant Number: 20K09905
- 6: Collaborative Research Grant from ICHIMARU PHARCOS Co., Ltd. (Japan): Yukio Ago (Principal Investigator, New)
- 7: Collaborative Research Grant from Tokuyama Corporation (Japan): Yukio Ago (Principal Investigator, New)
- 8: Research Grant from Satake Foundation (Japan): Eiji Imado (Principal Investigator, New)

(5) Academic Awards, etc.

None

(6) Patents

None

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## Department of Biomaterials

### (1) Staff and Students

Professor: Koichi Kato

Assistant Professor: Yuji Nomura, Isao Hirata, Rei Kuwabara

Administrative staff: Tomomi Date

Graduate Student: Tomoko Ogasawara, Satoshi Miyauchi, Ayana Nakano, Fumika Abe,  
Karina Erda, Yenny Yustisia

### (2) Main Research Activities

- 1: Biomaterials and biodevices for regenerative medicine
- 2: Development of novel disinfectants for dental materials
- 3: Study on the interactions between biological systems and biomaterial surfaces
- 4: Developing novel approaches for disease treatment with biomaterials

### (3) Research Achievements

#### A) Original Papers (including Case Reports)

- 1: Optimization of culture conditions for the efficient differentiation of mouse induced pluripotent stem cells into dental epithelial-like cells: Azusa Onishi, Aimi Naim Abdullah, Kotaro Tanimoto, Koichi Kato: *In Vitro Cellular & Developmental Biology - Animal* (2020), 56(9), 816-824.
- 2: Epidermal growth factor-immobilized surfaces for the selective expansion of neural progenitor cells derived from induced pluripotent stem cells: Yuka Yamauchi, Isao Hirata, Kotaro Tanimoto, Koichi Kato: *Biotechnology and Bioengineering* (2020), 117(9), 2741-2748.
- 3: Oriented immobilization of basic fibroblast growth factor: Bioengineered surface design for the expansion of human mesenchymal stromal cells: Ajay Shakya, Eiji Imado, Phuong Kim Nguyen, Tamamo Matsuyama, Kotaro Horimoto, Isao Hirata, Koichi Kato: *Scientific Reports* (2020), 10, 8762.
- 4: Acetate and butyrate improve  $\beta$ -cell metabolism and mitochondrial respiration under oxidative stress: Shuxian Hu, Rei Kuwabara, Bart J. de Haan, Alexandra M. Smink, Paul de Vos: *International Journal of Molecular Sciences* (2020), 21(4), 1542.
- 5: Low methyl-esterified pectin protects pancreatic  $\beta$ -cells against diabetes-induced oxidative and inflammatory stress via galectin-3: Shuxian Hu, Rei Kuwabara, Martin Beukema, Michela Ferrari, Bart J. de Haan, Marthe T.C. Walvoort, Paul de Vos, Alexandra M. Sminka: *Carbohydrate Polymers* (2020),

249, 116863.

B) Review

C) Publications

D) Other Publications

E) Presentations at Scientific Meetings

- 1: Development of biodegradable composite filament for 3D printer -Micropore formation on 3D printed scaffold-: Isao Hirata, Koichi Kato: The 75th General Session of the Japanese Society for Dental Materials and Devices (in a journal), 2020.

F) Special lectures in academic meetings

(4) Status of Receiving Grants-in Aid for Scientific Research, etc.

- 1: Fund for the Promotion of Joint International Research, Fostering Joint International Research (B), Grants-in-Aid for Scientific Research, JSPS (PI: Koichi Kato): Koichi Kato, Strategy for spatially-controlled tissue regeneration. 19KK0278. 1,800,000 JPY
- 2: Grant-in-Aid for Scientific Research (C), Ministry of Education, Culture, Sports, Science and Technology, JSPS (PI: Isao Hirata): Isao Hirata, Development of Metabolic System Controlled Culture Substrates to Maintain Stemness of Mesenchymal Stem Cells. 20K09994. 1,100,000 JPY
- 3: Grant-in-Aid for Challenging Exploratory Research, JSPS (PI: Kotaro Tanimoto): Koichi Kato, Protease-driven biomineralization and its application to enamel regeneration. 19K22717. 150,000 JPY
- 4: Fund for the Promotion of Joint International Research, Fostering Joint International Research (B), Grants-in-Aid for Scientific Research, JSPS (PI: Koichi Kato): Isao Hirata, Strategy for spatially-controlled tissue regeneration. 19KK0278. 200,000 JPY
- 5: Grant-in-Aid for Scientific Research (C), Ministry of Education, Culture, Sports, Science and Technology, JSPS (PI: Isao Hirata): Koichi Kato, Development of Metabolic System Controlled Culture Substrates to Maintain Stemness of Mesenchymal Stem Cells. 20K09994. 50,000 JPY
- 6: Grant-in-Aid for Scientific Research (C), Ministry of Education, Culture, Sports, Science and Technology, JSPS (PI: Koji Morita): Isao Hirata, Elucidation of the effects of masticatory ability on intestinal microflora and short-chain fatty acid production in persons requiring nursing care. 20K10034. 50,000 JPY

(5) Academic Awards, etc.

- 1: Mai Otaku, Seiji Shimoe, Yoshimasa Nagadori, Isao Hirata, Hiroyasu Koizumi, Hideo Matsumura, Takahiro Satoda: Analysis of chemical interaction between alumina-blasted silver palladium- copper-gold alloy and primer containing a phosphate monomer: Japanese Academy of Dental Technology, 2019 Best Article Selection/Excellent Research Article.

(6) Patents

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- **Department of Periodontal Medicine**
- **Division of Preventive and Restorative Dentistry Department of Periodontics**

(1) Staffs and Students

Professor: Hidemi Kurihara i (-March)

Associate Professor, Lecturer: Noriyoshi Mizuno

Assistant Professor: Tomoyuki Iwata, Kazuhisa Ouhara, Mikihito Kajiya, Shinji Matsuda, Ai Okanobu,  
Shinya Sasaki

Resident: Mizuho Kittaka (studying abroad), Tetsuya Yoshimoto (studying abroad), Nao Komatsu(-March),  
Yuta Hamamoto, , Tasuku Takemura, Daisuke Furutama, Saki Hatano, Sota Motoike

Graduate Student: Susumu Horikoshi, Misako Tari, Takumi Memida, Tomoya Ogawa, Hisakatsu Sone,  
Zhai Ruoqi, Shin Morimoto, Yuri Taniguchi, Tetsuya Tamura, Hiroki Yoshii, Mai Yoshino

Research Student: Masahiko Suzukawa,

Clinical Trainee: Mari kiyota, Yoshiaki Shimasaki (-March), Kei Takeshita (-March), Ryoko Kishi, Manabu  
Takewaki, Keita Takahashi

(2) Main Research Activities

- 1: Immunological and genetic study on the onset of periodontics
- 2: Study on periodontal tissue regeneration using bone marrow mesenchymal stem cells
- 3: Study on periodontal tissue regeneration using neurotrophines
4. Study on the relationship between periodontal disease and **rheumatoid arthritis**
5. Study on the relationship between periodontal disease and **diabetes mellitus**
- 6: Study on physiological function and differentiation of the cells derived from periodontal ligament
- 7: Study on prevention for periodontal disease
- 8: Study on **gingival hyperplasia**
- 9: Study on the relationship between periodontal disease and **scleroderma**
- 10: Study on the relationship between periodontal disease and dementia

(3) Research Achievements

A) Original Papers (including Case Reports)

1. A mandibular second molar with a middle mesial root canal.  
Nagahara T, Takeda K, Wada K, Shirawachi S, Iwata T, Kurihara H, Shiba H.  
*Clin Case Rep.* 2020 Mar; 9; 8(6); 1015-1020
2. From Chronic Periodontitis to Porphyromonas gingivalis infection  
Hidemi Kurihara, Kazuhisa Ouhara, Shinji Matsuda  
*The Journal of Hiroshima Dental Association.* 2020 Mar; 46(1); 1-14
3. Periodontal ligament cells regulate osteogenesis via miR-299-5p in mesenchymal stem cells. Kaneda-Ikeda E, Iwata T, Mizuno N, Nagahara T, Kajiya M, Takeda K, Hirata R, Ishida S, Yoshioka M, Fujita T, Kawaguchi H, Kurihara H.  
*Differentiation* 2020 Mar-Apr; 112; 47-57
4. Microbe-Dependent Exacerbated Alveolar Bone Destruction in Heterozygous Cherubism Mice.  
Mizuho Kittaka, Tetsuya Yoshimoto, Collin Schlosser, Mikihiro Kajiya, Hidemi Kurihara, Ernst J Reichenberger, Yasuyoshi Ueki  
*Journal of Bone and Mineral Research Plus* 2020 Apr; 4(6); e10352
5. Optineurin regulates osteoblastogenesis through STAT1.  
Mizuno N, Iwata T, Ohsawa R, Ouhara K, Matsuda S, Kajiya M, Matsuda Y, Kume K, Tada Y, Morino H, Yoshimoto T, Ueki Y, Mihara K, Sotomaru Y, Takeda K, Munenaga S, Fujita T, Kawaguchi H, Shiba H, Kawakami H, Kurihara H.  
*Biochem Biophys Res Commun.* 2020 May; 14;525(4); 889-894
6. Serum immunoglobulin G antibody titer to Fusobacterium nucleatum is associated with unfavorable outcome after stroke.  
Nishi H, Hosomi N, Ohta K, Aoki S, Nakamori M, Nezu T, Shigeishi H, Shintani T, Obayashi T, Ishikawa K, Kinoshita N, Shiga Y, Sugiyama M, Ohge H, Maruyama H, Kawaguchi H, Kurihara H.  
*Clin Exp Immunol.* 2020 June; 200(3); 302-309
7. Predictors of early postoperative pneumonia after oncologic surgery with the patients receiving professional oral health care: A prospective, multicentre, cohort study  
Shinichi Nozaki, Yasuhiko Tsutsumi, Yoshito Takasaki, Hiromasa Yoshikawa, Toshiaki Shinya, Ruriko Souta, Norimichi Nakamoto, Kohei Marukawa, Takeshi Usami, Jiro Sunami, Maho Takashima, Kohji Tanaka, Rishiho Nishizawa, Shigeaki Yanase, Kenji Negoro, Akihide Negishi, Hidenori Okumura, Yoshiaki Otsuka, Yasutoshi Honda, Hiroshi Otsuru, Takumi Arika, Takeshi Nakashima, Hiroshi Nagasaka, Yuuko Watanabe, Mikihiro Kajiya, Hidenobu Senpuku, Hiroshi Iwabuchi  
*Journal of Perioperative Practice* 2020 July; 10; 1177
8. Regulation of osteogenesis via miR-101-3p in mesenchymal stem cells by human gingival fibroblasts.  
Kaneda-Ikeda E, Iwata T, Mizuno N, Nagahara T, Kajiya M, Ouhara K, Yoshioka M, Ishida S, Kawaguchi H, Kurihara H.

- J Bone Miner Metab 2020 Jul; 38(4); 442-455
9. Oral environment and taste function of Japanese HIV-infected patients treated with antiretroviral therapy  
Shintani T, Fujii T, Yamasaki N, Kitagawa M, Iwata T, Saito S, Okada M, Ogawa I, Unei H,  
Hamamoto K, Nakaoka M, Kurihara H, Shiba H  
Aids Care 2020 Jul; 19; 1-6
10. Identification of regulatory mRNA and microRNA for differentiation into cementoblasts and periodontal ligament cells.  
Iwata T, Mizuno N, Nagahara T, Kaneda-Ikeda E, Kajiya M, Kitagawa M, Takeda K, Yoshioka M,  
Yagi R, Takata T, Kurihara H  
J Periodontal Res. 2020 Aug; Epub
11. Serum IgG titers to periodontal pathogens predict 3-month outcome in ischemic stroke patients.  
Aoki S, Hosomi N, Nishi H, Nakamori M, Nezu T, Shiga Y, Kinoshita N, Ueno H, Ishikawa K,  
Imamura E, Shintani T, Ohge H, Kawaguchi H, Kurihara H, Maruyama H.  
PLoS One. 2020 Aug; 6; 15(8)
12. Cox2-mediated PGE2 production via p38/JNK-c-fos signaling inhibits cell apoptosis in 3D floating culture clumps of mesenchymal stem cell/extracellular matrix complexes  
Komatsu N, Kajiya M, Morimoto S, Motoike S, Yoshii H, Iwata T, Ouhara K, Matsuda S, Mizuno N,  
Kurihara H.  
Biochem Biophys Res Commun. 2020 Sep; 17; 530(2); 448-454
13. IL-6 induced by periodontal inflammation causes neuroinflammation and disrupts the blood-brain barrier  
Furutama D, Matsuda S, Yamawaki Y, Hatano S, Okanobu A, Memida T, Oue H, Fujita T, Ouhara K,  
Kajiya M, Mizuno N, Kanematsu T, Tsuga K, and Kurihara H  
brain sciences 2020 Sep; 10(10); 679
14. Rapid detection of the Streptococcus mutans cnm gene by loop-mediated isothermal amplification.  
Kitagawa M, Nagamine K, Oka H, Ouhara K, Ogawa I, Komatsuzawa H, Kurihara H.  
Anal Biochem 2020 Sep, 15; 605
15. Effect of Porphyromonas gingivalis infection on gut dysbiosis and resultant arthritis exacerbation in mouse model  
Yuta Hamamoto, Kazuhisa Ouhara, Syuichi Munenaga, Mikio Shoji, Tatsuhiko Ozawa,  
Jyunzo Hisatsune, Isamu Kado, Mikihiro Kajiya, Shinji Matsuda, Toshihisa Kawai, Noriyoshi Mizuno,  
Tsuyoshi Fujita, Shintaro Hirata, Kotaro Tanimoto, Koji Nakayama, Hiroyuki Kishi, Eiji Sugiyama,  
Hidemi Kurihara  
Arthritis Research & Therapy 2020 Oct; 22; 249-263
16. Association between periodontal disease due to Campylobacter rectus and cerebral microbleeds in acute stroke patients.



- Shiga Y, Hosomi N, Nezu T, Nishi H, Aoki S, Nakamori M, Ishikawa K, Kinoshita N, Imamura E, Ueno H, Shintani T, Ohge H, Kawaguchi H, Kurihara H, Wakabayashi S, Maruyama H.  
PLoS One 2020 Oct; 8; 15(10)
17. Effects of perioperative oral care on postoperative inflammation following heart valve surgery.  
Nishi H, Takahashi S, Ohta K, Takamoto M, Shigeishi H, Go S, Obayashi T, Yoshioka Y, Konishi M, Shimizu Y, Yano K, Miyagawa T, Kakimoto N, Ohge H, Kawaguchi H, Kurihara H.  
Oral Dis 2020 Oct; 17
18. Serum IgG titers against periodontal pathogens are associated with cerebral hemorrhage growth and 3-month outcome.  
Nakamori M, Hosomi N, Nishi H, Aoki S, Nezu T, Shiga Y, Kinoshita N, Ishikawa K, Imamura E, Shintani T, Ohge H, Kawaguchi H, Kurihara H, Wakabayashi S, Maruyama H.  
PLoS One 2020 Oct; 28; 15(10)
19. Aggressive periodontitis and NOD2 variants.  
Mizuno N, Kume K, Nagatani Y, Matsuda S, Iwata T, Ouhara K, Kajiya M, Takeda K, Matsuda Y, Tada Y, Ohsawa R, Morino H, Mihara K, Fujita T, Kawaguchi H, Shiba H, Kawakami H, Kurihara H.  
J Hum Genet. 2020 Oct; 65(10); 841-846
20. Physiologic Target, Molecular Evolution, and Pathogenic Functions of a Monoclonal Anti-Citrullinated Protein Antibody Obtained From a Patient With Rheumatoid Arthritis.  
Tatsuhiko Ozawa, Kazuhisa Ouhara, Tsuda R, Munenaga S, Kurihara H, Kohno H, Hamana H, Kobayashi E, Taki H, Tobe K, Sugiyama E, Muraguchi A, Kishi H.  
Arthritis Rheumatol. 2020 Dec; 72(12); 2040-2049
21. Identification of a safe and highly specific titanium reagent for patch tests: results from a preliminary clinical trial.  
Kiatgawa M, Iwamoto K, Oka H, Tanaka M, Takechi M, Kurihara H, Hide M, Shiba H.  
JJSEDP 2020; in press.
22. Clinical Outcomes of Post-exposure Prophylaxis following Occupational Exposure to Human Immunodeficiency Virus at Dental Departments of Hiroshima University Hospital  
Shintani T, Iwata T, Okada M, Nakaoka M, Yamasaki N, Fujii T, Shiba H.  
Curr HIV Res 2020; 18 (6); 475-479

## B) Review

## C) Publications

## D) Other Publications

1. [Introduction of local efforts; nationwide selection! Infection control activity report of regional cooperation] Original efforts; Audit System via the Internet of Hiroshima Safety Dental Service Support Network

Tomoyuki Iwata, Noriyoshi Mizuno, Akihiro Sawa, Hidemi Kurihara

INFECTION CONTROL 2020 September; 29(9); 912-914

#### E) Presentation at Scientific Meeting

1. The ability of binding to type IV collagen by clinical isolates of *cnm* positive *Streptococcus mutans*  
Yuri Taniguchi, Kazuhisa Ouhara, Masae Kitagawa, Hitoshi Komatsuzawa, Hidemi Kurihara  
The 93rd annual meeting of Japanese society for Bacteriology (2020 February, Nagoya)
2. Infection Prevention Measures for Hospital Dentistry and Their Roles Efforts of the Dental Medical Subcommittee at the National Public University Hospital Infection Control Council  
Koji Ohta, Nakaoka M, Mizuno N, Niitani Y, Shiba H, Kurihara H, National Public University Hospital Infection Control Council Dental Care Subcommittee  
The 35th Annual Meeting of Japanese Society for Infection Prevention and Control (2020 February, Yokohama)
3. Rapid genetic testing of *cnm* positive *Streptococcus mutans* in oral cavity.  
Nagamine K, Kitagawa M, Ouhara K, Kurihara H.  
The 140th Annual Meeting of the Pharmaceutical Society of Japan (2020 March, Kyoto)
4. A case report of localized severe chronic periodontitis treated with tooth transplantation and multiple periodontal surgical procedures.  
Takayoshi Nagahara, Katsuhiro Takeda, Shirawachi Satomi, Tomoyuki Iwata, Hideki Shiba  
The 152nd Meeting of The Japanese Society of Conservative dentistry (2020 June, Kobe (in the magazine))
5. A case of chronic periapical periodontitis with apical external resorption in a mandibular second molar treated with root canal treatment, intentional replantation and apicoectomy  
Yuta Hamamoto, Mikihito Kajiya, Tomohito Mizuno, Hideki Shiba  
The 41st Annual Scientific Meeting of the Japan Endodontic Association (2020 June, Yamagata (in the magazine))
6. Perforation repair and periodontal regeneration therapy in mandibular central incisor with cemental tear showed a favorable clinical outcome  
Takayoshi Nagahara, Katsuhiro Takeda, Shirawachi Satomi, Tomoyuki Iwata, Keinoshin Wada, Hideki Shiba  
The 41st Annual Scientific Meeting of the Japan Endodontic Association (2020 June, Yamagata (in the magazine))
7. Humoral factors secreted from periodontal ligament cells regulates osteogenesis via microRNA in

mesenchymal stem cells

Tomoyuki Iwata, Eri Ikeda, Noriyoshi Mizuno, Takayoshi Nagahara, Mikihiro Kajiya,  
Katsuhiko Takeda, Ryoichi Yagi, Akihiro Konishi, Kazuhisa Ouhara, Tsuyoshi Fujita,  
Hidemi Kurihara

The 63rd Autumn Meeting of the Japanese Society of Periodontology (2020 July-August, Koriyama  
(Web))

8. A case of type 2 diabetes with polycystic ovarian syndrome and heavy obesity improved by dental intervention and subsequent diet therapy  
Yuta Hamamoto, Yuki Emura, Haruya Ono, Tomoaki Shintani, Shinji Matsuda, Mikihiro Kajiya,  
Masayasu Yoneda, Hidemi Kurihara  
The 63rd Annual Meeting of the Japan Diabetes Society (2020 October, Otsu (Web))
9. The effects of efforts by dental hygienist in diabetic therapy  
Emura Y, Kozono C, Hamamoto Y, Kajiya M, Ino M, Shintani T, Nakaoka M, Kurihara H,  
Yoneda M  
The 63rd Annual Meeting of the Japan Diabetes Society (2020 October, Otsu (Web))
10. Team medical care for type 2 diabetic patients - The role of dental hygienists-  
Kozono C, kajiya M, Memida T, Shintani T, Nagao A, Ono H, Nakaoka M, Kurihara H,  
Yoneda M  
The 63rd Annual Meeting of the Japan Diabetes Society (2020 October, Otsu (Web))
11. Rapid detection of the Porphyromonas gingivalis fimA genotypes II and IV by loop-mediated isothermal amplification  
Kitagawa M, Ouhara K, Nagamine K, Shiba H.  
The 13th Annual Meeting of Japanese Society for Evidence and the Dental Professional (2020 October, Tokyo)
12. Effect of chondro-inductive clumps of MSC/ECM complexes on bone regeneration  
Susumu Horikoshi, Mikihiro Kajiya, Souta Motoike, Tomoya Ogawa, Hisakatsu Sone, Hiroki Yoshii,  
Shin Morimoto, Mai Yoshino, Shinya Sasaki, Ai Okanobu, Shinji Matsuda, Tomoyuki Iwata, Kazuhisa Ouhara, Noriyoshi Mizuno  
The 59th Meeting of Hiroshima Prefectural Dental Association/The 104th Meeting of Hiroshima University Dental Society (2020 November, Hiroshima)
13. Periodontitis exacerbates non-alcoholic fatty liver irrelevant to glucose intolerance  
Misako Tari, Mikihiro Kajiya, Tasuku Takemura, Tetsuya Tamura, Shinji Matsuda, Tomoyuki Iwata,  
Kazuhisa Ouhara, Noriyoshi Mizuno  
The 59th Meeting of Hiroshima Prefectural Dental Association/The 104th Meeting of Hiroshima University Dental Society (2020 November, Hiroshima)
14. Efforts of dental hygienists at Hemophilia Treatment Center of Hiroshima University Hospital

Okada M, Shintani T, Kawagoe M, Iwata T, Takeda K, Shindou T, Yoshida K, Yamasaki N, Niizato N, Nakaoka M, Mizuno T, Fujii T, Oota K, Kozai K, Shiba H

The 59th Meeting of Hiroshima Prefectural Dental Association/The 104th Meeting of Hiroshima University Dental Society (2020 November, Hiroshima)

15. Selective detection of the *Porphyromonas gingivalis* fimA type II and IV genes by loop-mediated isothermal amplification

Nagamine K, Ouhara K, Okamura Y, Kitagawa M.

The 43rd Annual Meeting of the Molecular Biology Society of Japan (2020 December, Kyoto)

16. Specific oral bacteria associated with respiratory diseases requiring intensive care.

Nishi H, Obayashi T, Oshimo S, Kurihara H, Shime N, Kawaguchi H

The 42nd Annual Meeting, Japanese Society of Respiratory Care Medicine (2020 December, Kyoto)

#### F) Special lectures in academic meetings

1. The involvement of periodontal local infection by periodontopathogenic bacteria in the progression of systemic disease

Kazuhiisa Ouhara

Symposium/The 63rd Autumn Meeting of the Japanese Society of Periodontology (2020 July-August, Koriyama (Web))

2. The dysbiosis in gut for deterioration of arthritis in mouse model with *Porphyromonas gingivalis* infection

Yuta Hamamoto

Sunstar Young Investigator Award/ The 63rd Autumn Meeting of the Japanese Society of Periodontology (2020 October-November, Kanazawa (Web))

#### (4) Status of Receiving Grants-in Aid for Scientific Research.

1. Grants-in aid for scientific research (B): Hidemi Kurihara: #18H02977
2. Grants-in aid for scientific research (B): Noriyoshi Mizuno: #18H02978
3. Grants-in aid for scientific research (C): Kazuhisa Ouhara: #18K09599
4. Grants-in aid for scientific research (C): Mikihiro Kajiyama: #19K10129
5. Grants-in aid for scientific research (C): Shinji Matsuda: # 19K10130
6. Grants-in aid for Research Activity Start-up: Yuuta Hamamoto: #19K24073
7. Grants-in aid for scientific research (C): Eiji Sugiyama: #19K08908

8. Grants-in aid for scientific research (C): Tomoyuki Iwata: #20K09975
9. Grants-in aid for Early-Career Scientists: Ai Okanobu: #20K18536
10. Grant-in-Aid for Early-Career Scientists: Shinya Sasaki: #20K18574
11. Grants-in aid for Research Activity Start-up: Saki Hatano: #20K23111
12. Grants-in aid for Research Activity Start-up: Souta Motoike : #20K23082
13. Grants-in aid for Early-Career Scientists: Yuuta Hamamoto: #20K18537
14. Grants-in aid for scientific research (C): Masae Kitagawa: #20K09940
15. Mitsui Sumitomo Foundation Research Grant: Mikihito Kajiya

(5) Award.

1. Kazuhisa Ouhara  
Academic Award of the Japanese society of periodontology  
Research on the effect of local immune response of periodontal tissue against periodontal pathogens for systemic diseases
2. Mikihito Kajiya  
Academic Award of the Japanese society of periodontology  
Development of novel cytokine or cell therapy for periodontal tissue regeneration
3. Takumi Memida  
The 23rd Alumni association of school of dentistry hiroshima university encouragement award  
Multiple external root resorption of teeth as a new manifestation systemic sclerosis - A cross sectional study Japan

(6) Patents

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▪ **Department of Molecular Oral Medicine & Maxillofacial Surgery**  
 ▪ **Division of Oral & Maxillofacial Surgery and Oral Medicine (Department of Oral & Maxillofacial Surgery)**

(1) Staff and Students

Professor: Tetsuji Okamoto Chief: Tetsuji Okamoto (by-work) (~May)

Associate Professor: Shigeaki Toratani Chief: Shigeaki Toratani (by-work) (Apr~)

Clinical Associate Professor: Yasutaka Hayashido

Assistant Professor: Ryouji Tani, Yukio Yoshioka, Kouichi Koizumi, Taku Kanda, Kensaku Sumi, Tomoaki Hamana, Naohiro Kimura(Apr~), Sachiko Yamasaki, Taishi Sakaue (Apr~), Atuko Hmada(May~)

Clinical fellow: Naohiro Kimura(~May), Nanako Itoh(May~), Yuki Taguchi, Atuko Hmada(~Apr) , Eri Akagi(June~), Shigeru Sakurai(~May), Fuyuyoshi Takatsu(~June), Humitaka Obayashi, Kouji Tsushima(Oct~), Taeko Fukutani, Youji Nakase(~Sep), Mirai Higaki, Suguru Hirota(~Apr), Kensaku Matsui, Kaori Uchisako(~May), Seiya Hayashi, Tadayoshi Nobumoto, Takefumi Mishima(~May), Shigeki Satoh(Apr~)

Registered part-time doctor: Isao Takahashi, Koh Nabeshima, Yasutaka Ishida, Hidemasa Miyata, Yoshinari Myoken, Yoshinori Fujita Kohsei Okamoto, Yoku Ito, Akihiko Sakamoto

Graduate Student: Shigeki Sato(May), Hideaki Takahasji, Kento Okamoto(Apr~), Misato Tatsuki(Apr~) Iwao Katayama, Hidemasa Miyata, Yuuichi Arita, Tomohiro Sado(~Feb),

Researcher: Suguru Hirota(May~), Takefumi Mishima(June~), Shigeru Sakurai(Jun~), Youji Nakase(Oct~)

(2) Main Research Activities

1. Gene/molecular diagnosis and therapy for oral cancer and salivary gland tumors. (Cancer stem cells, growth factors, growth factor receptors, invasion and metastasis, tumor angiogenesis, and molecular/gene target therapy).
2. The molecular/genetic diagnosis and therapy for oral and cranio-maxillofacial deformities.
3. Establishment and characterization of human induced pluripotent stem (iPS) cells derived from human pulp cells in serum- and feeder-free cell culture.

4. Generation of human induced pluripotent stem (iPS) cells derived from patients with genetic disorders in the oral and cranio-maxillofacial region in serum- and feeder-free culture to elucidate the molecular mechanism involved in the disease.
5. Purification of biologically active factors from marine organism.
6. Photodynamic therapy for oral cancer.
7. Immune cell therapy for oral cancer by using NK/lymphokine-activated killer (LAK) cells.
8. Jaw and tooth regeneration *in vitro*.
9. Molecular-epidemiological study of oral and maxillofacial disease among residents of Semipalatinsk Nuclear Test Site (SNTS) area in Kazakhstan.
10. Measuring brain hemodynamic changes on mounting dental appliance using Near-Infrared Spectroscopy
11. The intestinal and oral microbiota of patients with oral cancer

### (3) Research Achievements

#### Original Papers (including Case Reports)

1. Oral Squamous Cell Carcinoma of the Tongue Dorsum with Multiple Cancer-associated Mutations in the TP53 Gene.: Yamasaki S., Tani R., Sakurai S., Toratani S., Okamoto T.: *Oral Oncology*, 10.1016/j.oraloncology.2020.104774
2. Induction of integration-free human-induced pluripotent stem cells under serum-and feeder-free conditions.: Hamada A., Akagi E., Yamasaki S., Nakatao H., Obayashi F., Ohtaka M., Nishimura K., Nakanishi M., Toratani S., Okamoto T.: *In Vitro Cellular & Developmental Biology-Animal*, 56(1), 85-95,2020.
3. Induction of Noonan syndrome-specific human induced pluripotent stem cells under serum-, feeder-, and integration-free conditions: Hamada A., Akagi E., Obayashi F., Yamasaki S., Koizumi K., Ohtaka M., Nishimura K., Nakanishi M., Toratani S., Okamoto, T.: *In Vitro Cellular & Developmental Biology-Animal*, 56(10), 888-895,2020.
4. Novel PTCH1 mutations in Japanese familial nevoid basal cell carcinoma syndrome. : Nakase Y., Hamada A., Kitamura N., Hata T., Toratani S., Yamamoto T., Okamoto T.: *Hum Genome Var*, 7(1), 38, 2020.
5. Antimicrobial susceptibility surveillance of bacterial isolates recovered in Japan from odontogenic infections in 2013.: Kaneko A., Matsumoto T., Iwabuchi H., Sato J., Wakamura T., Kiyota H., Tateda K., Hanaki H., Sakakibara N., Mizuno T., Miyajima H., Naito H., Takagi R., Kodama Y., Yamaguchi A., Akasiba R., Yamane N., Jinbu Y., Kusama M., Miyagi N., Kato R., Nakatogawa N., Izawa K., Tanzawa H., Koza Y., Watanabe H., Matsumoto K., Shibahara T., Busujima Y., Takato T., Sakamoto

- H., Watanabe D., Kubota H., Sasaki J., Uematsu M., Sasaki M., Kaetsu A., Terasawa F., Yura Y., Iwai S., Morita S., Matsumoto K., Oonishi T., Komori T., Furudo S., Fujibayashi J., Urade M., Kishimoto H., Yoshii T., Morihana T., Miyai D., Okamoto T., Kanda T., Okamoto K., Sakamoto A., Matsui Y., Miyake M., Sawai T., Ikebe T., Hashimoto K.: *J Infect Chemother.*,26(9), 882-889, 2020.5.19. doi: 10.1016/j.jiac.
6. Development of Kikuchi–Fujimoto disease after a cervical lymph node metastasis of mucoepidermoid carcinoma: a case report. Higaki M, Kanda T, Ando T, Tani R, Toratani S.: *Oral Maxillofac Surg.*, 24 August 2020. DOI: 10.1007/s10006-020-00900-4
  7. Modified Submental Island Flap for the Surgical Treatment of 4 Patients With Stage 3 Medication-Related Osteonecrosis of the Mandible.: Myoken Y., Fujita Y., Okamoto T.: *J Oral Maxillofac Surg.*,78(1), 29-34, 2020 Jan.
  8. Comment on Surgical Management of Medication-Related Osteonecrosis of the Jaw Is Associated With Improved Disease Resolution: A Retrospective Cohort Study by El-Rabbany et al.: Fujita Y, Myoken Y, Okamoto T.: *J Oral Maxillofac Surg.*,78(3):319, 2020 Mar.
  9. Inferior-based Nasolabial Flap for the Surgical Treatment of Stage 3 Medication-Related Osteonecrosis of the Maxilla: A Technical Note.: Fujita Y., Myoken Y., Okamoto T.: *Journal of Oral and Maxillofacial Surgery, Medicine, and Pathology.*,32, 212–215, 2020.
  10. Comment on "The Effect of Platelet-Rich Fibrin Membrane in Surgical Therapy of Medication-Related Osteonecrosis of the Jaw" by Szentpeteri et al.: Myoken Y., Fujita Y., Obayashi M.: *J Oral Maxillofac Surg.*, 78(8),1221-1222, 2020 Aug.
  11. Comment on "The effect of using a mobile application ('WhiteTeeth') on improving oral hygiene: A randomized controlled trial" by Scheerman et al.: Myoken Y., Myoken Y., Toratani S.: *Int J Dent Hyg.*18(4), 439-440, 2020 Nov.
  12. Osteonecrosis of the jaw in a metastatic lung cancer patient with bone metastases undergoing pembrolizumab + denosumab combination therapy: Case report and literature review.: Myoken Y., Fujita Y., Kawamoto K., Toratani S.: *Oral Oncol.* 2020 Dec. doi: 10.1016/j.oraloncology.2020.104874. Epub 2020 Jun 27.PMID: 32605876
  13. Reconstruction of an upper lip and intraoral defect following resection of an upper lip melanoma using a lower lip musculomucosal flap combined with a tongue flap: Yoshioka Y., Hayashido Y., Itoh Y., Toratani S., Okamoto T.: *Journal of Surgical Case Reports.*, 4, 1-4, 2020.
  14. Effects of perioperative oral care on postoperative inflammation following heart valve surgery : Nishi H., Takahashi S., Ohta K., Takamoto M., Shigeishi H., Go S., Obayashi T., Yoshioka Y., Konishi M., Shimizu Y., Yano K., Miyagawa T., Kakimoto N., Ohge H., Kawaguchi H., Kurihara H., *Oral Diseases.*, 2020 Oct. <https://doi.org/10.1111/odi.13682>
  15. Clinical investigation of oral cancer in adolescent and young adult generation: Yoshioka Y., Sakaue T., Matsui K., Tsushima K., Obayashi F., Hamada A., Yamasaki S., Hamana,T., Kanda T., Koizumi



K., Tani R., Sasahara H., Hayashido Y., Ito Y., Sado T., Ishida Y., Okamoto K., Kobayashi M., Sakamoto A., Myoken Y., Toratani S., Okamoto T., *Oral Science International*. 2020 Nov.  
<https://doi.org/10.1002/osi2.1093>

16. Usefulness of the submental island flap for the reconstruction in patients with carcinoma of floor of mouth.: Fujita Y., Myoken Y.: Japanese Society of Oral Oncology. 32(1), 15-21, 2020.
17. Functional analysis of insulin and cholesterol on the induction of cytotoxic activity of Lymphokine-activated killer cells.: Mishima T.: *Journal of Japan Tissue Culture Society for Dental Research*, 29(2), 1-12, 2020.
18. Genetic diagnostic study of Neurofibromatosis type I (von Recklinghausen's disease) using Next Generation Sequencing and Copy number alterations analysis : Fukutani T. : J. Hiroshima Univ. Dent. Soc., 52(2), 69-80,2020.
19. A clinical study of ameloblastoma in our department : Kanda T., Matsui K., Tsusima K., Taguchi Y., Satou S., Nobumoto T., Hirota S., Higaki M., Oobayasi F., Fukutani T., Sakurai S., Kimura N., Atsuko H., Sakaue T., Yakasaki S., Hamana T., Sumi K., Koizumi K., Yoshioka Y., Tani R., Hayashido Y., Toratani S., Okamoto T.: J. Hiroshima Univ. Dent. Soc., 52(1), 7-13,2020.
20. A case of congenital lymphatic malformation of the floor of mouth : Matsui K., Kanda T., Yoshioka Y., Atsuko H., Taguchi Y., Orita M., Okamoto T.: J. Hiroshima Univ. Dent. Soc., 52(1), 14-19,2020
21. Lip support prosthesis for the patients after resection of oral floor cancer : M. Yoshikawa, S. Yamada, M. Yoshida, T. Nagasaki, T. Nobumoto, T. Hamana, F. Ishida, K. Tanimoto, M. Naito, A. Kohada, T. Tsunoda, E. Ishida, K. Tsuga. : J. Hiroshima Univ. Dent. Soc., 52(2), 90-93,2020.

#### B) Review article

not applicable

#### C) Publications

not applicable

#### D) Other Publications

not applicable

#### E) Presentation at Scientific Meeting

1. Clinical study of Odontogenic keratocyst in our department.: Sakurai S., Kanda T., Matui K., Taguti Y., Koizumi K., Yoshioka Y., Tani R., Hayashido Y., Toratani S., Okamoto T.: The 74<sup>th</sup> Annual Meeting of Japanese Stomatological Society (Niigata Web meeting) Apr 15-17,2020.
2. Immunotherapy with Nivolumab for locally advanced and recurrent and/or metastatic oral cancer in Department of Oral and Maxillofacial Surgery, Hiroshima University Hospital.: Yoshioka Y., Hamana T., Matsui K., Sakurai S., Kanda T., Koizumi K., Tani R., Toratani S., Okamoto T.: The 74<sup>th</sup> Annual Meeting of Japanese Stomatological Society (Niigata Web meeting) Apr 15-17,2020.
3. Clinical investigation of adolescent and young adult generation (AYA) patients with oral cancer treated in Department of Oral and Maxillofacial Surgery, Hiroshima University Hospital (2<sup>nd</sup> report):. Yoshioka Y., Sakaue T., Matsui K., Koizumi K., Tani R., Hayashido Y., Toratani S., Okamoto T.: The 74<sup>th</sup> Annual Meeting of Japanese Stomatological Society (Niigata Web meeting) Apr 15-17,2020.
4. Measuring brain hemodynamic changes on mounting dental appliance using Near-Infrared Spectroscopy 3rd Report : Miyata H., Tani R., Hamana T., Toratani S., Okamoto T.: The 74<sup>th</sup> Annual Meeting of Japanese Stomatological Society (Niigata Web meeting) Apr 15-17,2020.
5. Modified Submental Island Flap for the Surgical Treatment of Patients With Medication-Related Osteonecrosis of the Jaw (MRONJ). :Myoken Y., Fujita Y., Sakaue R., Okamoto T. : The 74<sup>th</sup> Annual Meeting of Japanese Stomatological Society (Niigata Web meeting) Apr 15-17,2020.
6. Association between tooth loss and oral environments among femoral neck and trochanteric fracture patients.; Does tooth loss relate to the incidence of hip fracture?: Sakamoto A., Hashimoto M., Tanaka M., Takeuchi Y., Okada K., Arita Y.: 20<sup>th</sup> Scientific Meeting of the Japanese Society of Anti-Aging Medicine (Tokyo Web meeting) Sep 25-27, 2020.
7. A case of suspected first adult herpes infection with airway management: Kanda T., Sakurai S., Tatsuki M., Okamoto K., Ando T., Koizumi K., Yoshioka Y., Toratani T., Okamoto T.: The 33<sup>th</sup> Congress of the Japanese Society of Oral Diagnosis / Oral Medicine, The 30<sup>th</sup> Congress of the Japanese Society Oral Medicine, The 13<sup>th</sup> Congress of the Japanese Society for Evidence and the Dental Professional, Joint Academic Conference (Tokyo Web meeting) Oct 5-20, 2020.
8. A case of acute myelogenous leukemia led to diagnosis by lip edema: Matsui K., Tani R., Okamoto K., Toratani S.: The 33<sup>th</sup> Congress of the Japanese Society of Oral Diagnosis / Oral Medicine, The 30<sup>th</sup> Congress of the Japanese Society Oral Medicine, The 13<sup>th</sup> Congress of the Japanese Society for Evidence and the Dental Professional, Joint Academic Conference (Tokyo Web meeting) Oct 5-20, 2020.
9. The use for dentists of antimicrobial and questionnaire survey about the AMR of Onomichi-city.: K.okazaki, M.Fujimoto, S.Kurihara, Y.Ito.: The 58th Pharmaceutical Society of Japan, Japanese pharmacist society, Japanese hospital pharmacist society Chugoku branch office meeting(Shimane) Nov 7 ,2020.

10. A case of radiation pneumonitis caused by chemoradiation therapy after neck dissection of tongue cancer.: Takahashi H.,Kanda T.,Tani R., Tortoni S.,Kakimoto N.,Okamoto T. : The 65<sup>th</sup> Congress of the Japanese Oral and Maxillofacial Surgeons (Nagoya Web meeting) Nov 13-15, 2020.
11. A clinical study of the conservative surgical treatment of ameloblastoma in our department: Matsui K., Kanda T., Hamana T., Koizumi K., Yoshioka Y., Tani R., Hayashido Y., Toratani S., Okamoto T.: The 65<sup>th</sup> Congress of the Japanese Oral and Maxillofacial Surgeons (Nagoya Web meeting) Nov 13-15, 2020.
12. Diversity analysis of oral microbiota of oral cancer patients using next-generation sequencer: Matsui K., Tani R., Hamada A., Toratani S., Okamoto T.: The 65<sup>th</sup> Congress of the Japanese Oral and Maxillofacial Surgeons (Nagoya Web meeting) Nov 13-15, 2020.
13. A Case of Oral Squamous Cell Carcinoma of the Tongue Dorsum with Multiple Cancer associated with Mutations of the TP53 Gene.: Yamasaki S., Tani R., Sakurai S., Toratani S., Okamoto T. : The 65<sup>th</sup> Congress of the Japanese Oral and Maxillofacial Surgeons (Nagoya Web meeting) Nov 13-15, 2020.
14. A Case of Pleomorphic Adenoma at the Tip of the Palatine : Oobayashi F,Yamasaki S., Tortoni S.: The 65<sup>th</sup> Congress of the Japanese Oral and Maxillofacial Surgeons (Nagoya Web meeting) Nov 13-15, 2020.
15. A case of proliferative verrucous leukoplakia treated for a long time: focusing on carcinogenesis of PVL: Hirota S., Yoshioka Y., Mishima T., Toratani S.: The 65<sup>th</sup> Congress of the Japanese Oral and Maxillofacial Surgeons (Nagoya Web meeting) Nov 13-15, 2020.
16. Evaluation of pathological area of oral squamous cell carcinoma using fluorescence observation device with mouthguard® shading tooth autofluorescence : Taguchi Y., Hayashi S., Mastui K., Toratani S.: The 65<sup>th</sup> Congress of the Japanese Oral and Maxillofacial Surgeons (Nagoya Web meeting) Nov 13-15, 2020.
17. Plasminogen/plasmin system-mediated proliferation of oral squamous cell carcinoma cells : Hamana T., Takahashi H., Hayashido Y., Okamoto T.: The 65<sup>th</sup> Congress of the Japanese Oral and Maxillofacial Surgeons (Nagoya Web meeting) Nov 13-15, 2020.
18. Usefulness of Modified Submental Island Flap for the Surgical Treatment of Medication-Related Osteonecrosis of the Jaw (MRONJ):. Myoken Y., Monden K., Fujita Y., Toratani S.: The 65<sup>th</sup> Congress of the Japanese Oral and Maxillofacial Surgeons (Nagoya Web meeting) Nov 13-15, 2020.
19. A case of resumption of oral intake by rehabilitation in a patient with advanced tongue cancer who had a gastrostomy after intratumoral irradiation.: Yamada S., Yoshikawa M., Yoshida M., Nagasaki S., Kanda T., Takahashi H., Fujishiro A., Kakimoto N., Tanimoto K. : The 59<sup>th</sup> meeting of Hiroshima Prefecture Dental Society The 104<sup>th</sup> meeting of Hiroshima University Dental Association (Hiroshima) Nov 15, 2020.

20. A case of intentional replantation of a young permanent tooth with root fracture and paraproximal dislocation 2 months after injury. : Asao Y., Mitsuhashi C., Kanda T., Toratani S., Kozai K. : The 59th meeting of Hiroshima Prefecture Dental Society The 59th meeting of Hiroshima Prefecture Dental Society The 104th meeting of Hiroshima University Dental Association (Hiroshima) Nov 15, 2020.
21. A case of application of an overdenture with magnetic attachment to a patient with cerebral palsy.: Oda Y., Furutani C., Miyahara K., Miyazaki Y., Takashima K., Wakita A., Watari M., Mizota Y., Kanda T., Yoshida K., Oda A., Mukai T., Suda S., Irifune M., Okada Y. : The 37th Annual Meeting of the Japanese Society for Disability and Oral Health (Yokosuka Web meeting) Nov13-23, 2020.
22. Maxillary Tumor : Sakamoto S., Ando T., Kanda T., Suei Y., Nishida T., Ogawa I., Miyauchi T. : The 133rd academic meeting of the Chugoku-Shikoku Branch of the Japanese Society of Pathology (HiroshimaWebex Meetings) Nov 29, 2020.
23. A survey on the current status of hyponutrition risk factors and outpatient continuing nursing care for patients with feeding and swallowing disorders during hospitalization.: Hori H., Hirayama J., Kanemori M., Kubota Y., Miura A., Fujishiro A., Matsui K., Kanda T. : 2020 Hiroshima University Hospital Nursing Research Presentation Meeting (Hiroshima Webmeeting) Dec 5, 2020.

#### F) Special lectures at academic meetings

1. Cancer and Oral Care - Overcoming Cancer Treatment. : Ito N. Okamoto K.: Cancer workshop for healthcare professionals, Hiroshima North Cancer Network. (Hiroshima) Jan 28, 2020.
2. How do you examine an osteoporosis patient under the medical department dentistry cooperation? : Akitakata city dental association lecture. : K. Okamoto, N. Ito. : (Hiroshima) Feb 1, 2020.
3. Relation of a cancer and the oral cavity: Y,Ito, F.Takatu, C.Okgawa, A.Shibata.:The11th Onomichi general hospital Citizen open lecture2019(Hiroshima)Feb1,2020.
4. Case report in our department.: Sado T., Tsusima K.: Emergency medical lecture in the Miyoshi city dental association (Miyoshi) Feb 6, 2020.
5. The role of each occupations related to eating and swallowing in community medicine: Arita Y., Sakamoto A.: The collaborative workshop of the medical association, dental association and the pharmacist association in Minami ward in the Hiroshima city Minami ward medical Association (Hiroshima) Feb12, 2020.
6. Review again, key points for recognizing dysphagia in the elderly.: Y.Ishida.: Study meeting for ward nurses of Shimokamagari hospital (Kure) Jun 25, 2020.
7. The workshop of the dysphagia rehabilitation.: Arita Y., Sakamoto A.: The Hiroshima prefectural dental association (Kure) Oct 25, 2020.

8. Treatment of patients with jaw deformity in oral and maxillofacial surgery, Hiroshima University Hospital.:Koizumi K.: Hiroshima Orthodontic Association, Academic Lecture (Hiroshima) Dec.12,2020
9. The efforts to the dysphagia in Mazda hospital: : Arita Y., Sakamoto A.: The 36<sup>th</sup> Review series in the Hiroshima city medical association (Hiroshima) Dec 16, 2020.

#### (4) Status of Receiving Grants-in Aid for Scientific Research, etc.

1. Grants-in aid for scientific research (B): Tetsuji Okamoto. #18H0300000.
2. Grants-in aid for scientific research (C): Toratani Shigeaki: #18K09744.
3. Grants-in aid for scientific research (C):Yasutaka Hayashido: #19K103100A.
4. Grants-in aid for scientific research (C): Ryouji Tani: #19K103590A.
5. Grants-in aid for scientific research (C): Koichi Koizumi: #18K09767.
6. Grants-in aid for scientific research (C): Taku Kanda: #20K10117
7. Grants-in aid for scientific research (C): Tomoaki Shintani: #19K17199.
8. Grants-in aid for scientific research (C): Sachiko Yamasaki: #18K09723
9. Grant-in-Aid for Young Scientists: Yuki Taguchi: #19K192330.
10. Grant-in-Aid for Young Scientists: Atsuko Hamada: #19K191980.
11. Grant-in-Aid for Young Scientists: Suguru Hirota: #19K19197.
12. Grant-in-Aid for Young Scientists: Kensaku Matsui: #19K191620.
13. Grant-in-Aid for Young Scientists: Shigeru Sakurai: #20K18726
14. Grant-in-Aid for Young Scientists: Fumitaka Obayashi: #20K18670
15. Grant-in-Aid for Young Scientists: Yoji Nakase: #20K18725
16. Grant-in-Aid for Start-up:Tadayoshi Nobumoto: #19K24147.
17. Grant-in-Aid for Start-up:Takefumi Mishima: #19K24148.

#### (5) Academic Awards, etc.

1. Sakaue T. : Outstanding Paper Award of Japanese Stomatological Society. Apr 2020.
2. Sakaue T : Encouragement Award of the alumni association of Hiroshima Univ. Oral & maxillofacial Surgery 1<sup>st</sup>. Nov 23, 2020.
3. Mishima T: The 26th Japan Tissue Culture Society for Dental Research Young Researcher's Award. 2020.11.

#### (6) Patents

not applicable

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- **Department of Oral and Maxillofacial Surgery**
- **Division of Oral and Maxillofacial Surgery and Oral Medicine (Department of Oral and Maxillofacial Reconstructive Surgery)**

(1) Staff and Students

Associate Professor: Masaaki Takechi

Assistant Professor: Koichiro Higashikawa (~Mar)

Research Associate: Yoshiaki Ninomiya (Diagnosis and treatment lecturer), Hiroshi Shimasue (~Mar), Shigehiro Ono (Diagnosis and treatment lecturer), Kuniko Mizuta, Takayuki Nakagawa, Misato Tada, Akiko Fukui, Takako Naruse

Resident: Yasuki Ishioka, Fumi Ishida, Yoko Ishida, Kazuki Sasaki, Sayaka Seino(~Jun), Ryo Uetsuki, Hiroki Kato, Hiroshi Murodumi (~Mar)

Graduate Student: Miyuki Sakuma, Sho Yokoyama, Satoshi Okuda, Shohei Fukada, Nao Yamakado, Misaki Akagi (Apr~), Erina Hashimoto (Apr~), Koichiro Samejima (Apr~Sep)

Registered Intern: Masaki Kiyomihara, Yoshihisa Inoue, Taro Kashihara, Yasuhiro Tanaka

(2) Main Research Activities

- 1 : Functional evaluation and development of oral and maxillofacial reconstructive surgeries
- 2 : Genomic analysis of stomatognathic diseases
- 3 : Biochemical characterization and development of therapeutics of oral tumors
- 4 : Molecular-biological studies on control of invasion and migration of oral cancers
- 5 : Studies on responsible gene of osseous dysplasia of jaws
- 6 : Molecular-biological studies on dental and periodontal tissue regeneration
- 7 : Development of biomaterials of oral and maxillofacial reconstruction
- 8 : Development of biomaterial for dental implant treatment

(3) Research Achievements

A) Original Papers (including Case Reports)

- 1) Immune response to cytosolic DNA via intercellular receptor modulation in oral keratinocytes and fibroblasts. Naruse T, Ohta K, Kato H, Ishida Y, Shigeishi H, Sakuma M, Fukui A, Nakagawa T, Tobiume K, Nishi H, Takechi M. Oral Dis. 00: 1-14, 2020.
- 2) TGF- $\beta$ 1 induces amoeboid-to-mesenchymal transition of CD44<sup>high</sup> oral squamous cell carcinoma cells via miR-422a downregulation through ERK activation and Cofilin-1 phosphorylation. Yokoyama S, Shigeishi H, Murodumi H, Sakuma M, Kato H, Higashikawa K, Ohta K, Takechi M. J

Oral Pathol Med (in press).

- 3) Morphological Evaluation of Bone by CT to Determine Primary Stability-Clinical Study. Takechi M, Ishioka Y, Ninomiya Y, Ono S, Tada M, Nakagawa T, Sasaki K, Murodumi H, Shigeishi H, Ohta K. *Materials (Basel)*. 13: 2605, 2020.
- 4) Melatonin-induced miR-181c-5p enhances osteogenic differentiation and mineralization of human jawbone-derived osteoblastic cells. Murodumi H, Shigeishi H, Kato H, Yokoyama S, Sakuma M, Tada M, Ono S, Rahman MZ, Ohta K, Takechi M. *Mol Med Rep*. 22: 3549-3558, 2020.
- 5) Dysferlin-deficient myotubes show tethering of different membrane compartments characterized by TMEM16E and DHPR $\alpha$ . Kubozono K, Mizuta K, Fujimoto S, Tran TT, Kamata N, Tobiume K. *Biochem Biophys Res Commun*. 529: 720-725, 2020.
- 6) Zoledronate Inhibits Osteoclast Differentiation via Suppressing Vascular Endothelial Growth Factor Receptor 2 Expression. Nakagawa T, Ohta K, Uetsuki R, Kato H, Naruse T, Murodumi H, Yokoyama S, Sakuma M, Ono S, Takechi M. *Biochem Genet*. 58: 473-489, 2020.
- 7) Intranasal midazolam conscious sedation for dental surgery in child with left ventricular noncompaction. Miyauchi M, Hama Y, Ono S, Takechi M. *Journal of Oral and Maxillofacial Surgery, Medicine, and Pathology* (in press).
- 8) High cervical transmasseteric anteroparotid approach for mandibular condylectomy. Okuda S, Ono S, Tada M, Ishida F, Uetsuki R, Takechi M. *Journal of Oral and Maxillofacial Surgery, Medicine, and Pathology* (in press).
- 9) Detection of HPV16 E6 DNA in periodontal pockets of middle-aged and older people. Shigeishi H, Murodumi H, Ohta K, Sugiyama M. *Oral Sci Int* (in press).
- 10) Usefulness of Tranexamic Acid Administration During Sagittal Split Ramus Osteotomy. Yoshida M, Ono S, Shimizu Y, Oue K, Mukai A, Doi M, Irifune M. *J Craniofac Surg* (in press).
- 11) In vitro investigation of the cell compatibility and antibacterial properties of titanium treated with calcium and ozone. Takechi M, Takamoto M, Ninomiya Y, Ono S, Mizuta K, Nakagawa T, Shigeishi H, Ohta K, Ishikawa K, Tsuru K. *Dental Materials Journal* (in press).
- 12) A Case of Orthognathic Surgery for Jaw Deformity with Facial Asymmetry Following Condylar Fracture in Early Childhood. Mizuta K, Ono S, Sasaki K, Murodumi H, Takechi M. *J. Jpn. Soc. O.M.F. Trauma*. 19: 23-29, 2020.
- 13) One case with the split crest and GBR using interconnective porous hydroxyapatite ceramic (NEOBONE<sup>®</sup>) in a patient with abnormal alveolar bone resorption in the anterior region of the upper jaw. Ninomiya Y, Takechi M. *J Acad Clin Dent*. 40 :213-218 2020.

## B) Review

## C) Publications

## D) Other Publications

## E) Presentation at Scientific Meeting

- 1) A case of Central Giant Cell Granuloma of the Condyle. Okuda S, Ono S, Tada M, Ishida F, Mizuta K, Uetsuki R, Kakimoto N, Ogawa I, Takechi M. The 38<sup>th</sup> Annual Meeting of Japanese Society of Oral Oncology (Tokyo), 2020.1.24
- 2) Recognition of *Candida albicans* cell wall and CEACAM1 expression in oral keratinocytes. Sakuma M, Ohta K, Kato H, Fuku A, Naruse T, Shigeishi H, Takechi M. The 74<sup>rd</sup> Annual Meeting of Japanese Stomatological Society (Niigata Web), 2020.4.15
- 3) Three cases of orthognathic surgical treatment of maxillary protrusion with deformity of the mandibular condyle. Ono S, Mizuta K, Yoshimi Y, Abe T, Uetsuki R, Nakagawa T, Tanimoto K, Takechi M. The 30<sup>th</sup> Annual Meeting of the Japanese Society for Jaw Deformities (Niigata Web), 2020.6.24~7.9
- 4) Gingival Tumor of the Mandible. Sakamoto S, Ando T, Mizuta K, Ishida F, Kato H, Ono S, Konishi M, Miyauchi M, Ogawa I. The 31<sup>rd</sup> Annual Meeting of the Japanese Society of Oral Pathology (Nagoya Web), 2020.9.16~10.6
- 5) Clinical study of dental implant treatment in the Department of Oral and Maxillofacial Surgery. Ishioka Y, Ninomiya Y, Yokoyama S, Sasaki K, Takechi M. The 50<sup>th</sup> Anniversary Annual Meeting of the Japanese Society of Oral Implantology (Yokohama Web), 2020.9.19~9.25
- 6) Recognition of *Candida* cell wall components by CEACAM1 against *Candida albicans* infection. Sakuma M, Ohta K, Kato H, Naruse T, Ishida Y, Fukui A, Shigeishi H, Takechi M. The 33<sup>th</sup> Annual Meeting of Japanese Society of Oral Diagnosis / Oral Medicine, The 30<sup>th</sup> Annual Meeting of Japanese Society of Oral Medicine, The 13<sup>th</sup> Annual Meeting of Japanese Society for Evidence and the Dental Professional (Web), 2020.10.05~20
- 7) Evaluation of anti-tumor effect of anti-integrin agent, MK-0429. Nakagawa T, Ohta K, Naruse T, Sakuma M, Ono S, Takechi M. The 65<sup>th</sup> Congress of the Japanese Society of Oral and Maxillofacial Surgeons (Nagoya Web), 2020.11.13~11.15
- 8) Comprehensive Analysis of Cetuximab-Resistant Genes in Oral Cancer Cells with EMT Phenotype. Okuda S, Higashikawa K, Yamakado N, Uetsuki R, Ishida F, Ono S, Okumura T, Nakahara K, Shimasue H, Takechi M. The 65<sup>th</sup> Congress of the Japanese Society of Oral and Maxillofacial Surgeons (Nagoya Web), 2020.11.13~11.15
- 9) Comprehensive gene transcript analysis in oral cancer cells with EMT phenoty. Yamakado N, Higashikawa K, Okuda S, Uetsuki R, Ishida F, Ono S, Okumura T, Kubozono K, Shimasue H, Takechi M. The 65<sup>th</sup> Congress of the Japanese Society of Oral and Maxillofacial Surgeons (Nagoya Web), 2020.11.13~11.15



- 10) Recognition mechanism of Candida cell wall by CEACAM1 in oral keratinocytes. Sakuma M, Ohta K, Kato H, Naruse T, Ishida Y, Fuku A, Shigeishi H, Takechi M. The 65<sup>th</sup> Congress of the Japanese Society of Oral and Maxillofacial Surgeons (Nagoya Web), 2020.11.13~11.15
- 11) Clinical study on weight change after orthognathic surgery. Uetsuki R, Ono S, Mizuta K, Nakagawa T, Takechi M. The 65<sup>th</sup> Congress of the Japanese Society of Oral and Maxillofacial Surgeons (Nagoya Web), 2020.11.13~11.15
- 12) Clinical study on removal of dental implants in our department. Ninomiya Y, Ono S, Mizuta K, Tada M, Takechi Masaaki. The 65<sup>th</sup> Congress of the Japanese Society of Oral and Maxillofacial Surgeons (Nagoya Web), 2020.11.13~11.15
- 13) A case of a large ameloblastoma in mandible treated by repeated conservative treatment (marsupialization). Ishida F, Mizuta K, Murodumi H, Ono S, Takechi M. The 65<sup>th</sup> Congress of the Japanese Society of Oral and Maxillofacial Surgeons (Nagoya Web), 2020.11.13~11.15
- 14) Clinical examination of factors influencing the results of treatment with intranasal residuals. Ishioka Y, Ninomiya Y, Sasaki K, Yokoyama S, Suzuki E, Samejima K, Akagi M, Yamakado N, Fukada S, Okuda S, Sakuma M, Murodumi H, Kato H, Uetsuki R, Naruse T, Ishida Y, Ishida F, Fukui A, Tada M, Nakagawa T, Mizuta K, Ono S, Ohta K, Takechi M. The 59<sup>th</sup> Annual Meeting of the Hiroshima Association for Dental Science, The 104<sup>th</sup> Annual Meeting of the Hiroshima University Dental Society (Hiroshima), 2020.11.15

#### F) Special lectures in academic meetings

- 1) Special Lecture of University of the Ryukyus School of Dentistry “Maxillofacial implant” Takechi M (Web), 2020.7.14
- 2) Special Lecture at Hokkaido University School of Dentistry "Osteogenesis related to oral implants" Takechi M (Web), 2020.9.4

#### (4) Status of Receiving Grants-in Aid for Scientific Research, etc.

- 1) Grants-in-aid for scientific research (C) Novelty: Ono S, Takechi M, Tobiume K : #20K10139
- 2) Grants-in-aid for scientific research (C) Continuation: Tada M, Takechi M, Ninomiya Y : #19K10267
- 3) Grants-in-aid for scientific research (C) Continuation: Mizuta K, Tobiume K : #19K10309
- 4) Grants-in-aid for Young Scientists (B) Continuation: Ishida Y : #18K17226
- 5) Grants-in-aid for scientific research (C) Continuation: Nakagawa T, Fukuda N, Miyamoto Y, Mano T, Kurio N : #18K09746
- 6) Grants-in-aid for the Harmonic Ito Foundation: Nakagawa T : #3010156
- 7) Grants-in-aid for Young Scientists (B) Continuation: Uetsuki R : #18K17198

- 8) Grants-in-aid for Young Scientists (B) Novelty: Ishida F : #19K19161
- 9) Grants-in aid for scientific research (C) Continuation: Takechi M, Ohta K, Ono S : #18K09790
- 10) Grants-in aid for scientific research (C) Novelty: Ishioka Y, Ono S : #20K10161
- 11) Grants-in aid for scientific research (C) Continuation: Shimasue H, Tobiume K : #18K09813
- 12) Grants-in-aid for Young Scientists (B) Novelty: Seino S : #20K18696

(5) Academic Awards, etc.

- 1) The 33<sup>th</sup> Annual Meeting of Japanese Society of Oral Diagnosis / Oral Medicine, The 30<sup>th</sup> Annual Meeting of Japanese Society of Oral Medicine, The 13<sup>th</sup> Annual Meeting of Japanese Society for Evidence and the Dental Professional (Web), 2020.10.05~20 : President's Award : Sakuma M

(6) Patents

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- **Department of Advanced Prosthodontics**
- **Division of Preventive and Restorative Dentistry  
(Department of Oral Implant)**

(1) Staff and Students

Professor: Kazuhiro Tsuga

Associate Professor: Yasuhiko Abe, Mineka Yoshikawa, Takayasu Kubo

Assistant Professor: Hiroshi Oue, Yohei Okazaki, Shinsuke Okada, Takahiro Mori, Yoshifumi Oki

Research Associate: Maho Takeuchi, Mariko Maruyama, Aya Hiraoka, Azusa Kuroki

Graduate Student: Erika Asahara, Eri Ishida, Kiichi Nakamori, Kanako Yamawaki, Azusa Haruta, Anna Sera

Clinical Trainee: Ryo Takeshita

Administrative staff: Rinko Kurumi

(2) Main Research Activities

- 1 : Elucidation of the effect of prosthodontic treatments on the quality of life of elderly people.
- 2 : Removal prosthodontics and swallowing function of elderly people.
- 3 : Development and clinical application of functional oral rehabilitation utilizing tongue pressure measurement.
- 4 : Development and clinical application of new materials for oral implants.
- 5 : Development of novel biomaterial with “bio-metal” .
- 6 : Elucidation of the effect of FGF on bone formation surrounding oral implants.
- 7 : Biomechanics analysis of prostheses and their surrounding bone supported by implants.

(3) Research Achievements

A) Original Papers (including Case Reports)

1 : The development of novel bioactive porous titanium as a bone reconstruction material: Doi K, Kobatake R, Makihara Y, Oki Y, Umehara H, Kubo T, Tsuga K: RSC Advances, 10: 22684-22690, 2020.

2 : Development of a novel bioactive titanium membrane with alkali treatment for bone regeneration: Umehara H, Doi K, Oki Y, Kobatake R, Makihara Y, Kubo T, Tsuga K: Dental material journal, 39: 877-882, 2020.

3 : Comparative study of surface modification treatment for porous titanium: Kobatake R, Doi K, Oki Y, Makihara Y, Umehara H, Kubo T, Tsuga K: J Oral Maxillofac Res, 11: e5, 2020.

- 4 : IL-6 Induced by Periodontal Inflammation Causes Neuroinflammation and Disrupts the Blood-Brain Barrier: Furutama D, Matsuda S, Yamawaki Y, Hatano S, Okanobu A, Memida T, Oue H, Fujita T, Ouhara K, Kajiya M, Mizuno N, Kanematsu T, Tsuga K, Kurihara H.: *Brain Sci.* 2020 Sep 27;10(10):679.
- 5 : Oral function in ALS and other neurodegenerative diseases: Hiraoka A, Yoshida M, Tsuga K: *Annals of Japan Prosthodontic Society*, 12: 322-329, 2020.
- 6 : Association between masticatory ability and oral functions: Maruyama M, Morita K, Kimura H, Nishio F, Yoshida M, Tsuga K: *J Clin Exp Dent*, 12:e1011-e1014, 2020.
- 7 : Bone turnover markers to assess jawbone quality prior to dental implant treatment: a case-control study: Keisuke Yasuda, Shinsuke Okada, Yohei Okazaki, Kyou Hiasa, Kazuhiro Tsuga, Yasuhiko Abe: *International Journal of Implant Dentistry*, 6: 67, 2020.
- 8 : Antimicrobial effects of viscous mouthwashes containing cetylpyridinium chloride and isopropyl methylphenol: Yasuhiko Abe, Yohei Okazaki, Kana Dainobu, Kenya Matsuo, Hideyuki Ishida, Kazuhiro Tsuga: *American Journal of Dentistry*, 33(5), 235-238, 2020.
- 9 : Initial Curing Characteristics of Composite Cements under Ceramic Restorations: Masanao Inokoshi, Kosuke Nozaki, Tomohiro Takagaki, Yohei Okazaki, Kumiko Yoshihara, Shunsuke Minakuchi, Bart Van Meerbeek: *Journal of Prosthodontic Research*, JPOR\_2019\_330
- 10 : Development of tissue conditioner containing cetylpyridinium chloride montmorillonite as new antimicrobial agent: pilot study on antimicrobial activity and biocompatibility: Tsubasa Naoe, Akira Hasebe, Rumi Horiuchi, Yoji Makita, Yohei Okazaki, Keisuke Yasuda, Kenya Matsuo, Yasuhiro Yoshida, Kazuhiro Tsuga, Yasuhiko Abe, Atsuro Yokoyama: *Journal of Prosthodontic Research*, 64(4), 436-443, 2020.
- 11 : Bonding efficacy of a new self-adhesive restorative material onto flat dentin versus class-I cavity-bottom dentin: Chenmin Yao, Mohammed H Ahmed, Yohei Okazaki, Kirsten L Van Landuyt, Cui Huang, Bart Van Meerbeek: *Journal of adhesive dentistry*, 22(1), 65-77,2020.
- 12 : Basic survey for the prevention of intraoral residual medication in older adults. A pilot study: Hasegawa Y, Sakuramoto-Sadakane A, Yoshida M, Yoshikawa M, Nozaki S, Hikasa S, Horii N, Sugita H, Ono T, Shinmura K, Kishimoto H: *Gerodontology*, 37: 93-96, 2020.
- 13 : Association between mixing ability of masticatory functions measured using color-changing chewing gum and frailty among Japanese older adults. The Kyoto-Kameoka Study: Watanabe D, Yoshida T, Yokoyama K, Yoshinaka Y, Watanabe Y, Kikutani T, Yoshida M, Yamada Y, Kimura M: *Int J Environ Res Public Health*, 17: 4555; <https://doi.org/10.3390/ijerph17124555>, 2020.
- 14 : Five-year change in maximum tongue pressure and physical function in community-dwelling elderly adults: Higa C, Mori T, Hiraoka A, Takeda C, Kuroki A, Yoshikawa M, Yoshida M, Tsuga K: *J Dent Sci*, 15: 265-269, 2020.
- 15 : Association between salivary alpha-amylase and subjective and objective oral parafunctions in community-dwelling elderly individuals: Morita K, Kimura H, Tsuka H, Nishio F, Yoshida M, Tsuga K: *J Dent Sci*, 15: 310-314, 2020.
- 16 : Delayed swallowing reflex is overlooked in swallowing screening among acute stroke patients:Takeda C, Yoshida M, Nakamori M, Hosomi N, Nagasaki T, Yoshikawa M, Kayashita J, Masuda S, Maruyama H, Tsuga K: *J Stroke Cerebrovasc Dis*, 29: 105303, 2020.
- 17 : Improper sitting posture while eating adversely affects maximum tongue pressure: Yoshikawa M, Nagakawa K, Tanaka R, Yamawaki K, Mori T, Hiraoka A, Higa C, Nishikawa Y, Yoshida M, Tsuga K: *J Dent Sci*,16(1): 467-473, 2021. <https://doi.org/10.1016/j.jds.2020.08.012>
- 18 : Comparison of the Iowa Oral performance instrument and JMS tongue pressure measurement device: Yoshikawa M, Fukuoka T, Mori T, Hiraoka A, Higa C, Kuroki A, Takeda C, Maruyama M, Yoshida M, Tsuga K: *J Dent Sci*, 16(1); 214-219, 2021. <https://doi.org/10.1016/j.jds.2020.06.005>
- 19 : Association between stroke lesions and videofluoroscopic findings in acute stroke patients: Nakamori M, Hosomi N, Imamura E, Matsushima H, Maetani Y, Yoshida M, Yoshikawa M, Takeda C, Nagasaki T, Masuda S, Kayashita J, Tsuga K, Tanimoto K, Wakabayashi S, Maruyama H: *J Neurol*, 2020 Sep 26, <https://doi.org/10.1007/s00415-020-10244-4>, Online ahead of print.
- 20 : Oral colonization by antimicrobial-resistant Gram- negative bacteria among long-term care facility residents: prevalence, risk factors, and molecular epidemiology: Le Mi Nguyen-Tra, Kayama S,

Yoshikawa M, Hara T, Kashiya S, Hisatsune J, Tsuruda K, Onodera M, Ohge H, Tsuga K, Sugai M: Antimicrob Resist Infect Control. 2020; 9: 45. Doi: 10.1186/s13756-020-0705-1.

2 1 : Developing New Information Sheets for Evacuees and Evacuation Centers to be Used During All Natural Disaster Phases. : Kitano H, Kako M, Tsuga K, Nikawa H, Mikami Y, Yamashita H, Mori M, Ohge H.: Prehosp Disaster Med. 2020 Dec;35(6):683-687.

2 2 : Reliability and comparability of methods for assessing oral function: Chewing, tongue pressure and lip force. : Arakawa I, Abou-Ayash S, Genton L, Tsuga K, Leles CR, Schimmel M.: J Oral Rehabil. 2020 Jul;47(7):862-871

## B) Review

## C) Publications

## D) Other Publications

1 : Evaluation of oral hypofunction using the tongue : Hiraoka A, Yoshida M, Tsuga K : The Nippon Dental Review, 80(6), 126-135, 2020.

2 : Useful for clinical practice Medicinal liquid toothpaste "Oral Prevent & Care Mouthwash": Yohei Okazaki, Yasuhiko Abe: Dental Diamond, 4, 164-167, 2020.

## E) Presentation at Scientific Meeting

1 : A cross sectional study of preferred chewing side and masticatory function in community dwelling elderly: Mori T, Morita K, Yoshikawa M, Tsuga K: The 64th Scientific Meeting of the Japanese Society of Stomatognathic Function (Online), 2020.

2 : Lip support prosthesis for the Patients after resection of oral floor cancer: Sachiko Yamada, Mitsuyoshi Yoshida, Mineka Yoshikawa, Atsumasa Kohada, Tatsuhiko Kakuda, Eisaku Ishida, Toshikazu Nagasaki, Kazuhiro Tsuga: 2020 Japan Prosthodontic Society Chugoku & Shikoku Branch(Higashi Hiroshima)

3 : Characteristics of overlooked aspiration in swallowing screening among acute stroke patients: Takeda C, Hiraoka A, Mori T, Maehara A, Nishimura R, Yoshikawa M, Yoshida M, Tsuga K: The 31th Annual Meeting of the Japanese Society of Geriatric Dentistry (Tokyo), 2020.

4 : A cross sectional study of preferred chewing side and masticatory function in community dwelling elderly: Mori T, Morita K, Yoshikawa M, Tsuga K: The 64th Scientific Meeting of the Japanese Society of Stomatognathic Function (Online), 2020.

5 : A cross sectional study of lip closure forces in community dwelling elderly: Haruta A, Mori T, Takeda C, Umehara H, Asahara E, Yokoi M, Hiraoka A, Maruyama M, Morita K, Yoshikawa M, Yoshida M, Tsuga K: The 31th Annual Meeting of the Japanese Society of Geriatric Dentistry (Tokyo), 2020.

6 : The effect of tooth loss on cerebrovascular disorder in mouse model: Oue H, Yokoi M, Ishida E, Nishihata H, Shidosawa M, Tsuga K: The Scientific Meeting of the Japan Prosthodontic Society , Chugoku · Shikoku Branch (Hiroshima) , 2020.

7 : Evaluation of alkali treatment for porous titanium as bone reconstruction material: Kobatake R,

Doi K, Makihara Y, Oki Y, Umehara H, Kubo T, Tsuga K: 98th General session & exhibition of the IADR (Washington DC), 2020.

8 : Novel development of porous titanium with bone formation promoting ability: Kobatake R, Doi K, Kubo T, Makihara Y, Oki Y, Umehara H, Tsuga K: The 129th Scientific Meeting of Japan Prosthodontic Society (Fukuoka), 2020.

9 : Bacteriological effects of mouthwash containing new CPC / IPMP on sports mouthguard materials: Nakamori K, Okazaki Y, Asahara E, Abe Y, Tsuga K: 31st Annual Meeting of the Japanese Academy of Sports Dentistry (Hiroshima), 2020.

10 : A case in which oral intake was resumed due to continuous rehabilitation in a patient with gastrostomy after intra-tissue irradiation for advanced tongue cancer: Sachiko Yamada, Mineka Yoshikawa, Mitsuyoshi Yoshida, Toshikazu Nagasaki, Taku Kanda, Hideaki Takahashi, Akiko Fujishiro, Naoya Kakimoto, Kotaro Tanimoto: The 59th Hiroshima Prefectural Dental Association, The 104th Hiroshiam University Dental Society Regular Meeting (Hiroshima)

#### F) Special lectures in academic meetings

1 : Association between masticatory ability and oral functions: Maruyama M, Morita K, Kimura H, Nishio F, Yoshida M, Tsuga K: J Clin Exp Dent. 2020 Nov 1;12(11):e1011-e1014. doi: 10.4317/jced.56747.

#### (4) Status of Receiving Grants-in Aid for Scientific Research, etc.

1 : MEXT Grant-in-Aid for Young Scientists: Oki Y: Development of the cell introduction type bio-membrane. (Grant No. 20K18561). ¥2,990,000

2 : Maruyama M: Development of Sustainable Hygiene Mask Materials for Droplet Infection Prevention: The Hiroshima University Award for Encouraging Female Researchers. (incentive research expense). ¥800,000

3 : MEXT Grant-in-Aid for Scientific Research (C): Kubo T: Exploring the effects of osteoporosis therapy on masticatory and cognitive functions. (Grant No. 20K10072). ¥1,560,000

4 : MEXT Grant-in-Aid for Scientific Research (C): Tsuga K: Development of functional oral rehabilitation by sucking candy. (Grant No. 26462951). ¥1,300,000

5 : MEXT Grant-in-Aid for Scientific Research (C): Yoshikawa M: Understanding the distribution of resistant bacteria in the oral cavity and the effect of dental hygiene management on medical / long-term care-related pneumonia(Grant No. 20K10248). ¥1820,000

6 : MEXT Grant-in- Aid for Young Scientists: Mori T: Development of an individual model for prediction of functional recovery after prosthodontic treatment (Grant No. 19K19129). ¥2,060,000

7 : MEXT Grant-in-Aid for Early-Career Scientists : Hiraoka A : New development of posture-maintaining orthosis useful for preventing low back pain during dental treatment for long-term care recipients. (Grant No. 20K18806). ¥1,800,000

8 : MEXT Grant-in-Aid for Scientific Research (C): Oue H: Elucidation of the mechanism by which tooth loss causes cognitive decline .(Grant No. 20K10035).¥1,600,000

9 : MEXT Grant-in-Aid for Scientific Research (C) : Abe Y: Development of antibacterial denture base material that does not fix Candida in the deep layer of the denture base. (Grant No. 20K10052). ¥1,300,000

10 : MEXT Grant-in-Aid for Scientific Research (C) : Okazaki Y : Development of a new reproducible antibacterial adhesive system with antibacterial activity. (Grant No. 19K10206). ¥1,300,000

1 1 : MEXT Grant-in-Aid for Scientific Research (C): Tsuga K: Development of novel examination for chewing force. (Grant No. 18K09660). ¥1,690,000

(5) Academic Awards, etc.

1 : Maruyama M: Development of Sustainable Hygiene Mask Materials for Droplet Infection Prevention: The Hiroshima University Award for Encouraging Female Researchers, 2020.

(6) Patents

[Return to Contents](#)

- **Department of Advanced Prosthodontics**
- **Division of Preventive and Restorative Dentistry  
(Department of Prosthetic Dentistry)**

### (1) Staff and Students

Professor	: Kazuhiro Tsuga
Associate Professor	: Hitoshi Abekura, Mitsuyoshi Yoshida
Assistant Professor	: Kazuya Doi, Kouji Morita,, Yusuke Makihara, Keisuke Yasuda,
Resident	: Kazuko Kagawa, Chiaki Higa, Miyuki Yokoi, Fumiko Nishio
Graduate Student	: Hanako Umehara, Hitomi Kimura, Chiho Takeda, Yuhei Hashimoto
Reserch Fellow	: Reiko Kobatake
Clinical Trainee	: Sachiko Takagi, Wataru Teshima
Administrative staff	: Rinko Kurumi

### (2) Main Research Activities

- 8 : Elucidation of the effect of prosthodontic treatments on the quality of life of elderly people.
- 9 : Removal prosthodontics and swallowing function of elderly people.
- 1 0 : Development and clinical application of functional oral rehabilitation utilizing tongue pressure measurement.
- 1 1 : Development and clinical application of new materials for oral implants.
- 1 2 : Development of novel biomaterial with “bio-metal”.
- 1 3 : Elucidation of the effect of FGF on bone formation surrounding oral implants.
- 1 4 : Biomechanics analysis of prostheses and their surrounding bone supported by implants.
- 1 5 : Dental clinical application of super engineering plastics

### (3) Research Achievements

#### A) Original Papers (including Case Reports)

- 1 : The development of novel bioactive porous titanium as a bone reconstruction material: Doi K, Kobatake R, Makihara Y, Oki Y, Umehara H, Kubo T, Tsuga K: RSC Advances, 10: 22684-22690, 2020.
- 2 : Development of a novel bioactive titanium membrane with alkali treatment for bone regeneration:



- Umehara H, Doi K, Oki Y, Kobatake R, Makihara Y, Kubo T, Tsuga K: *Dental material journal*, 39: 877-882, 2020.
- 3 : Comparative study of surface modification treatment for porous titanium: Kobatake R, Doi K, Oki Y, Makihara Y, Umehara H, Kubo T, Tsuga K: *J Oral Maxillofac Res*, 11: e5, 2020.
- 4 : Acid bone lysates reduce bone regeneration in rat calvaria defects: Strauss FJ, Kuchler U, Kobatake R, Heimel P, Tangl S, Gruber R. J: *Biomed Mater Res A*, in press
- 5 : miRNA-21 deficiency impairs alveolar socket healing in mice: Strauss FJ, Stähli A, Kobatake R, Tangl S, Heimel P, Schosserer M, Hackl M, Grillari J, Gruber R: *Journal of Periodontology*, 91: 1664-1672, 2020.
- 6 : Basic survey for the prevention of intraoral residual medication in older adults. A pilot study: Hasegawa Y, Sakuramoto-Sadakane A, Yoshida M, Yoshikawa M, Nozaki S, Hikasa S, Horii N, Sugita H, Ono T, Shinmura K, Kishimoto H: *Gerodontology*, 37: 93-96, 2020.
- 7 : Association between mixing ability of masticatory functions measured using color-changing chewing gum and frailty among Japanese older adults. The Kyoto–Kameoka Study: Watanabe D, Yoshida T, Yokoyama K, Yoshinaka Y, Watanabe Y, Kikutani T, Yoshida M, Yamada Y, Kimura M: *Int J Environ Res Public Health*, 17: 4555; <https://doi.org/10.3390/ijerph17124555>, 2020.
- 8 : Five-year change in maximum tongue pressure and physical function in community-dwelling elderly adults: Higa C, Mori T, Hiraoka A, Takeda C, Kuroki A, Yoshikawa M, Yoshida M, Tsuga K: *J Dent Sci*, 15: 265-269, 2020.
- 9 : Association between salivary alpha-amylase and subjective and objective oral parafunctions in community-dwelling elderly individuals: Morita K, Kimura H, Tsuka H, Nishio F, Yoshida M, Tsuga K: *J Dent Sci*, 15: 310-314, 2020.
- 1 0 : Association between masticatory ability and oral functions: Maruyama M, Morita K, Kimura H, Nishio F, Yoshida M, Tsuga K: *J Clin Exp Dent*, 12:e1011-e1014, 2020.
- 1 1 : Delayed swallowing reflex is overlooked in swallowing screening among acute stroke patients: Takeda C, Yoshida M, Nakamori M, Hosomi N, Nagasaki T, Yoshikawa M, Kayashita J, Masuda S, Maruyama H, Tsuga K: *J Stroke Cerebrovasc Dis*, 29: 105303, 2020.
- 1 2 : Oral function in ALS and other neurodegenerative diseases: Hiraoka A, Yoshida M, Tsuga K: *Annals of Japan Prosthodontic Society*, 12: 322-329, 2020.
- 1 3 : Mucoadhesion of polyamphoteric hydrogels synthesized from acrylic acid and N,N-dimethylaminopropyl acrylamide: Nishio F, Hirata I, Nakamae K, Tsuga K, Kato K: *International Journal of Adhesion and Adhesives* 104(2):102746, 2021
- 1 4 : Oral Implant Treatment for a Patient Undergoing Molecularly Targeted Drug Therapy for Chronic Myelocytic Leukemia: A Case Report: Morita K, Tsuka H, Kuremoto KC, Tsuga K: *Int J Prosthodont*, 33:111-115, 2020.
- 1 5 : Developing New Information Sheets for Evacuees and Evacuation Centers to be Used During

All Natural Disaster Phases. : Kitano H, Kako M, Tsuga K, Nikawa H, Mikami Y, Yamashita H, Mori M, Ohge H.: Prehosp Disaster Med. 2020 Dec;35(6):683-687.

- 1 6 : Reliability and comparability of methods for assessing oral function: Chewing, tongue pressure and lip force. : Arakawa I, Abou-Ayash S, Genton L, Tsuga K, Leles CR, Schimmel M.: J Oral Rehabil. 2020 Jul;47(7):862-871
- 1 7 : Association between mixing ability of masticatory functions measured using color-changing chewing gum and frailty among Japanese older adults. The Kyoto–Kameoka Study: Watanabe D, Yoshida T, Yokoyama K, Yoshinaka Y, Watanabe Y, Kikutani T, Yoshida M, Yamada Y, Kimura M: Int J Environ Res Public Health, 17: 4555; <https://doi.org/10.3390/ijerph17124555>, 2020.
- 1 8 : Improper sitting posture while eating adversely affects maximum tongue pressure: Yoshikawa M, Nagakawa K, Tanaka R, Yamawaki K, Mori T, Hiraoka A, Higa C, Nishikawa Y, Yoshida M, Tsuga K: J Dent Sci, 16(1): 467-473, 2021. <https://doi.org/10.1016/j.jds.2020.08.012>
- 1 9 : Comparison of the Iowa Oral performance instrument and JMS tongue pressure measurement device: Yoshikawa M, Fukuoka T, Mori T, Hiraoka A, Higa C, Kuroki A, Takeda C, Maruyama M, Yoshida M, Tsuga K: J Dent Sci, 16(1); 214-219, 2021. <https://doi.org/10.1016/j.jds.2020.06.005>
- 2 0 : Association between stroke lesions and videofluoroscopic findings in acute stroke patients: Nakamori M, Hosomi N, Imamura E, Matsushima H, Maetani Y, Yoshida M, Yoshikawa M, Takeda C, Nagasaki T, Masuda S, Kayashita J, Tsuga K, Tanimoto K, Wakabayashi S, Maruyama H: J Neurol, 2020 Sep 26, <https://doi.org/10.1007/s00415-020-10244-4>, Online ahead of print.

## B) Review

- 1 : Sarcopenia and mastication: Yoshida M, Tsuga K: Current Oral Health Reports, 7: 179-187, 2020.

## C) Publications

- 1 : Chapter 3, Classification for prosthesis, 1 Crown and bridge, Course for dental hygienist education, Treatment and assistance of crown and denture prosthesis, 1st ed, ed by Matsumura H et al.: Abekura H: Nagasueshoten.co. Kyoto, Japan, p26-30, 2020.
- 2 : Chapter 3: Complete denture treatment, ❶ Out line for complete denture treatment, ❷ Practical process and assistant for complete denture treatment, ❸ Countermeasure and trouble of complete denture treatment, The newest series of textbook for dental hygienist education-Basic theory and practical process for prosthodontic dentistry, 2nd, ed., edited by the Japan association for dental hygienist education: Tsuga K, Abekura H :Ishiyaku publishers, INC, Tokyo, Japan, p109-110, p111-131, P143-144, 2020.

## D) Other Publications

- 1 : Clinical practice of the molar PEEK crown, Digital Dentistry YEARBOOK 2020, Case presentation-CAD/CAM, 1st ed: Abekura H: Quintessence publishing, Tokyo, p161168, 2020.
- 2 : Evaluation of oral hypofunction using the tongue : Hiraoka A, Yoshida M, Tsuga K : The Nippon Dental Review, 80(6), 126-135, 2020.
- 3 : Dream Genealogy: What the Dream Challenge Award has brought up: Kobatake R: Phoenix Club, 27: 9, 2020

## E) Presentation at Scientific Meeting

- 1 : Influence of the abutment tooth shape in the making high bride resin CAD/CAM crown: Otaku M, Iwaguro S, Abekura H : The 59th academic meeting of Hiroshima prefectural dental association and the 104th academic meeting of Hiroshima University dentistry society, Hiroshima, 2020.
- 2 : Examination of the relationship between the presence or absence of awake bruxism during daytime and the actual state of masseter muscle activity : Ishimaru T, Yamaguchi T, Hattori Y, Ono T, Arai Y, Hasegawa Y, Shiga H, Tamaki K, Tanaka J, Tsuga K, Abekura H, Miyawaki S, Maeda A, Mikami S, Gotoda A, Satoh K: The 64th academic meeting of Japanese society of stomatognathic function, Iwate, 2020.
- 3 : A case of improving swallow and speech function with Palatal Augmentation Prosthesis after operation of lingual cancer: Makihara Y: Scientific Meeting of Japan Prosthodontic Society Chugoku&Shikoku Branch(Saijyou), 2020.
- 4 : Evaluation of alkali treatment for porous titanium as bone reconstruction material: Kobatake R, Doi K, Makihara Y, Oki Y, Umehara H, Kubo T, Tsuga K: 98th General session & exhibition of the IADR (Washington DC), 2020.
- 5 : Novel development of porous titanium with bone formation promoting ability: Kobatake R, Doi K, Kubo T, Makihara Y, Oki Y, Umehara H, Tsuga K: The 129th Scientific Meeting of Japan Prosthodontic Society (Fukuoka), 2020.
- 6 : Symposium [Question for Oral Hypofunction]: Yoshida Mitsuyoshi, inohara ken, Ueda takayuki, Tsuga Kazuhiro, Sato Yuuji: 31th Meeting of Japanese Society of Gerodontology (Tokyo) 2020A cross sectional study of preferred chewing side and masticatory function in community dwelling elderly: Mori T, Morita K, Yoshikawa M, Tsuga K: The 64th Scientific Meeting of the Japanese Society of Stomatognathic Function (Online), 2020.
- 7 : Lip support prosthesis for the Patients after resection of oral floor cancer: Sachiko Yamada, Mitsuyoshi Yoshida, Mineka Yoshikawa, Atsumasa Kohada, Tatsuhiko Kakuda, Eisaku Ishida, Toshikazu Nagasaki, Kazuhiro Tsuga: 2020 Japan Prosthodontic Society Chugoku & Shikoku Branch(Higashi Hiroshima)Characteristics of overlooked aspiration in swallowing screening among acute stroke patients: Takeda C, Hiraoka A,Mori T, Maehara A, Nishimura R, Yoshikawa M, Yoshida M, Tsuga K: The 31th Annual Meeting of the Japanese Society of Geriatric Dentistry (Tokyo), 2020.
- 8 : A case in which oral intake was resumed due to continuous rehabilitation in a patient with gastrostomy after intra-tissue irradiation for advanced tongue cancer: Sachiko Yamada, Mineka Yoshikawa, Mitsuyoshi Yoshida, Toshikazu Nagasaki, Taku Kanda, Hideaki Takahashi, Akiko Fujishiro, Naoya Kakimoto, Kotaro Tanimoto: The 59th Hiroshima Prefectural Dental Association, The 104th Hiroshiam University Dental Society Regular Meeting (Hiroshima)
- 9 : Characteristics of overlooked aspiration in swallowing screening among acute stroke patients: Takeda C, Hiraoka A,Mori T, Maehara A, Nishimura R, Yoshikawa M, Yoshida M, Tsuga K: The 31th Annual Meeting of the Japanese Society of Geriatric Dentistry (Tokyo), 2020.
- 10 : A cross sectional study of lip closure forces in community dwelling elderly: Haruta A, Mori T, Takeda C, Umehara H, Asahara E, Yokoi M, Hiraoka A, Maruyama M, Morita K, Yoshikawa

M, Yoshida M, Tsuga K: The 31th Annual Meeting of the Japanese Society of Geriatric Dentistry (Tokyo), 2020.

- 1 : Clinical report of 6 months after wearing PEEK crown on molars: Kimura H, Morita K, Tsuka H, Kagawa K, Higa C, Yokoi M, Kuroki A, Nishio F, Asahara E, Abekura H, Tsuga K: The 129th Scientific Meeting of Japan Prosthodontic Society (web), 2020.

#### F) Special lectures in academic meetings

- 1 : Digital Dentistry Today and Tomorrow, Key points of the insurance medical treatment for the CAD/CAM crown: Abekura H: Prosthodontic specialist seminar of Japan prosthodontics society Cyugoku-shikoku branch, Higashihiroshima, 2020.
- 2 : The insurance medical treatment of the CAD/CAM crown, Out line, indication and the process of teeth preparation to impression: Abekura H : Lifelong learning seminar of Shimane prefectural dental association and Annual of Japan prosthodontic society, Matsue, 2020.
- 3 : Association between masticatory ability and oral functions: Maruyama M, Morita K, Kimura H, Nishio F, Yoshida M, Tsuga K: J Clin Exp Dent. 2020 Nov 1;12(11):e1011-e1014. doi: 10.4317/jced.56747.

#### (4) Status of Receiving Grants-in Aid for Scientific Research, etc.

- 1 : MEXT Grant-in-Aid for Scientific Research (C):Abekura H: A study of splint discontinuous wear based on EEG and EMG analysis of long-term dynamics of bruxism(Grant No. 17K11782). ¥650,000.
- 2 : MEXT Grant-in-Aid for Scientific Research (C): Yoshida M: Establishing the scientific basis for objectively diagnosing the availability of oral intake in patients with aspiration pneumonia. (Grant No. 19K10207). ¥700,000
- 3 : Grant-in-Aid for Research Activity Start-up: Nishio F: Development of new antibacterial silver nanoparticles-containing PEEK crown with preventive effect on periodontitis and secondary caries. (Grant No. 20K23028). ¥1,430,000
- 4 : MEXT Grant-in-Aid for Scientific Research (C): Morita K: Elucidation of the effects of masticatory ability on intestinal microflora and short-chain fatty acid production in people requiring nursing care. (Grant No. 20K10034). ¥1,430,000
- 5 : MEXT Grant-in- Aid for Young Scientists (B): Makihara Y: Establishment of bone regeneration therapy for osteoporosis using bone formation promoting hydroxyapatite. (Grant No. 19K19053). ¥2,080,000.
- 6 : MEXT Grant-in-Aid for JSPS Fellows: Kobatake R: Novel development of bone reconstruction treatment by bioactive porous titanium. (Grant No. 19J13235). ¥1,000,000.
- 7 : Yanmar Environmental Sustainability Support Association: Kobatake R: Development of novel plant cultivation scaffold by porous titanium. (Grant No. 0G21406). ¥250,000.
- 8 : MEXT Grant-in-Aid for Scientific Research (C): Doi K: Establishment of bone reconstruction with

implant stability using bioactive porous titanium. (Grant No. 18K09683). ¥1,69,000

(5) Academic Awards, etc.

- 1 : Kobatake R: Plant cultivation project with porous titanium: 18th Campus Venture Grand Prix (CVG) Chugoku regional competition Excellent award (Energia Chugoku Electric Power Award) , 2020.
- 2 : Kobatake R: Evaluation of alkali treatment for porous titanium as bone reconstruction material: 98th General session & exhibition of the IADR Frechette Prosthodontic Research Award Competition Finalist, 2020.
- 3 : Kobatake R: Hiroshima University Graduate School of Biomedical Sciences Award, 2020.
- 4 : Kobatake R: 23rd Hiroshima University School of Dentistry Alumni Association Encouragement Award, 2020.

(6) Patents

- 1 : Doi K, Kobatake R, Onishi H, Inoue T: 骨再建部材: Japanese Patent (JP6713632) (Applicants Hiroshima University, Nagamine seisakusho)

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**Department of Orthodontics and Craniofacial Development  
Biology  
Division of Oral Health and Development  
Department of Orthodontics**

(1) Staff and Students

Professor: Kotaro Tanimoto

Associate Professor: Hiroshi Ueda

Lecturer: Ryo Kunimatsu

Assistant Professor: Yuki Asakawa, Naoto Hirose, Yuki Yoshimi, Tetsuya Awada, Yuji Tsuka, Takaharu Abe

Intern: Makoto Yanoshita, Koji Iwai, Azusa Onishi, Isamu Kado, Mami Takano, Sakura Yamada,

Yuka Yashima, Hiroki So, Yuka Yamauchi, Tomoka Hiraki, Jin Izumino, Shota Ito

Education and Research Support Staff: Cynthia Concepción Medina

Graduate Student: Kazuyo Ando, Haruka Kagawa, Yuma Koizumi, Ayaka Nakatani, Ayana Nakano,

Sayumi Miura, Shuzo Sakata, Sayuri Nishiyama, Kazutaka Ikeda, Eri Ishida,

Tomohiro Ogasawara, Eri Tsuboi, Kodai Rikitake, Naoki Kubo, Kanae Oda,

Nurul Aisyah Rizky Putranti, Fumika Abe, Shintaro Ogashira, Sho Oshima, Ayaka Odo,

Risako Oshiro, Saki Ogawa, Daiki Kita, Katsuhito Sugai

Reserch Student: Moe Matsunaga

Visiting Professor: Kazuo Tanne, Eiji Tanaka, Ichiro Takahashi, Shoichi Miyawaki

Registered Intern: Kuniaki Tanaka, Kazunori Itatani, Eri Ohtani, Yu Matsumura, Shoutoku Kojima,

Saki Okita, Hidemi Gunji, Yuko Nakao, Aya Kimura, Taeko Yamamoto

Dental Hygienist: Miho Okada, Saori Ikeda

(2) Main Research Activities

- 1 : Elucidation of pathogenic mechanism in malocclusion and management of oral maxillofacial skeletal growth
- 2 : Optimization of tooth movement by orthodontic force
- 3 : Establishment of a new orthodontic treatment based on the image and biochemical diagnosis of temporomandibular disorders (TMD)
- 4 : Application of regeneration medicine to orthodontic treatment
- 5 : Suppression of caries risk in orthodontic treatment
- 6 : Evaluation of the contribution of various oral functions to general fitness
- 7 : Development of new instruments and materials for orthodontic treatment

(3) Research Achievements

## A) Original Papers (2020.1-2020.12 症例報告を含む)

- 1 : The matrix vesicle cargo miR-125b accumulates in the bone matrix, inhibiting bone resorption in mice : Minamizaki T., Nakao Y., Irie Y., Ahmed F., Itoh S., Sarmin N., Yoshioka H., Nobukiyo A., Fujimoto C., Niida S., Sotomaru Y., Tanimoto K., Kozai K., Sugiyama T., Bonnelye E., Takei Y., Yoshiko Y.: *Commun Biol.*, 3 (1), 30, 2020.
- 2 : Examination of the effect of combined use of Nd:YAG laser irradiation and mechanical force loading on bone metabolism using cultured human osteoblasts : Tsuka Y., Kunimatsu R., Gunji H., Abe T., Cynthia CM., Nakajima K., Kimura A., Hiraki T., Nakatani A., Tanimoto K.: *J Laser Med Sci.*, 11 (2), 138-143, 2020.
- 3 : Bone Regeneration in a Canine Model of Artificial Jaw Cleft Using Bone Marrow-Derived Mesenchymal Stem Cells and Carbonate Hydroxyapatite Carrier : Abe T., Sumi K., Kunimatsu R., Oki N., Tsuka Y., Awada T., Nakajima K., Sugiyama M., Tanimoto K.: *Cleft Palate Craniofac J.*, 57 (2), 208-217, 2020.
- 4 : Stem cell-derived conditioned media from human exfoliated deciduous teeth promotes bone regeneration : Hiraki T., Kunimatsu R., Nakajima K., Abe T., Yamada S., Rikitake K., Tanimoto K.: *Oral dis.*, 26 (2), 381-390, 2020.
- 5 : High-frequency near-infrared diode laser irradiation attenuates IL-1 $\beta$ -induced expression of inflammatory cytokines and matrix metalloproteinases in human primary chondrocytes : Sakata S., Kunimatsu R., Tsuka Y., Nakatani A., Hiraki T., Gunji H., Hirose N., Yanoshita M., N.A.R. Putranti., Tanimoto K.: *J Clin Med.*, 9 (3): E881., 2020.
- 6 : Effect of Continuous Compressive Force on the Expression of RANKL, OPG, and VEGF in Osteocytes : Yashima Y., Kaku M., Yamamoto T., Izumino J., Kagawa H., Ikeda K., Shimoe S., Tanimoto K.: *Biomed Res-Tokyo*, 41 (2), 91-99, 2020.
- 7 : Protective Effects of Cilengitide on Inflammation in Chondrocytes Under Excessive Mechanical Stress : Hirose N., Okamoto Y., Yanoshita M., Asakawa Y., Sumi C., Takano M., Nishiyama S., Su SC., Mitsuyoshi T., Kunimatsu R., Tanne K., Tanimoto K.: *Cell Biol Int.*, 44 (4), 996-974, 2020.
- 8 : Muscarinic receptors promote castration-resistant growth of prostate cancer through a FAK-YAP signaling axis : Goto Y., Ando T., Izumi H., Feng X., Arang N., Gilardi M., Wang Z., Ando K., Gutkind S.: *Oncogene*, 39 (20), 4014-4027, 2020.
- 9 : Baicalin inhibits root resorption during tooth movement in a rodent model : Kunimatsu R., Kimura A., Tsuka Y., Horie K., Yoshimi Y., Awada T., Gunji H., Abe T., Nakajima K., Sakata S., Nakatani A., Tanimoto K.: *Archives of Oral Biology*, 116, 104770, 2020.
- 10 : Examination of the effect of combined use of Er:YAG laser irradiation and mechanical force loading on bone metabolism using primary Human Gingival Fibroblasts : Tsuka Y., Kunimatsu R., Gunji H., Abe T., Cynthia CM., Hiraki T., Nakatani A., Sakata S., Rikitake K., N.A.R. Putranti., Hirose N.,

- Yanoshita M., Tanimoto K.: *Lasers Med Sci.*, 35, 2059–2064, 2020.
- 11 : Orthodontic Treatment Combined with Miniscrew Anchorage for an Angle Class II Division 1 Case with Severe Crowding and TMDs : Hirose N., Yanoshita M., Onishi A., Yamauchi Y., Nishiyama Y., Takano M., Tsuboi E., Kubo N., Tanimoto K.: *Dent Res Oral Health.*, 3 (3), 129-140, 2020.
- 12 : Epidermal growth factor-immobilized surfaces for the selective expansion of neural progenitor cells derived from induced pluripotent stem cell : Yamauchi Y., Hirata I., Tanimoto K., Kato K.: *Biotechnol Bioeng.*, 117 (9), 2741-2748, 2020.
- 13 : Effects of Hyperbaric Oxygen Treatment on Calvarial Bone Regeneration in Young and Adult Mice : Izumino J., Kaku M., Yamamoto T., Yashima Y., Kagawa H., Ikeda K., Shimoe S., Tanimoto K.: *Arch. Oral Biol.*, 117 (2020) 1048283, 2020.
- 14 : FAK inhibition protects condylar cartilage under excessive mechanical stress : Yanoshita M., Hirose N., Sumi C., Takano M., Nishiyama S., Tsuboi E., Onishi A., Yamauchi Y., Asakawa Y., Kunimatsu R., Tanimoto K.: *Oral dis.*, 26 (8), 1736-1746, 2020
- 15 : Optimization of culture conditions for the efficient differentiation of mouse induced pluripotent stem cells into dental epithelial-like cells : Onishi A., Abdullah AN., Tanimoto K., Kato K.: *In Vitro Cell. Dev. Biol. Anim.*, 56 (9), 816-824, 2020.
- 16 : Effect of Porphyomonas gingivalis infection on gut dysbiosis and resultant arthritis exacerbation in mouse model : Hamamoto Y., Ouhara K., Munenaga S., Shoji M., Ozawa T., Hisatsune J., Kado I., Kajiya M., Matsuda S., Kawai T., Mizuno N., Fujita T., Hirata S., Tanimoto K., Nakayama K., Kishi H., Sugiyama E., Kurihara H.: *Arthritis Res Ther.*, 22 (1):249, 2020.
- 17 : The impact of fixed orthodontic appliances on oral microbiome dynamics in Japanese patients : Kado I., Hisatsune J., Tsuruda K., Tanimoto K., Sugai M.: *Sci Rep.*, 10 (1):21989, 2020.
- 18 : Re-treatment of a case with three congenital missing teeth undergone orthodontic treatment with tooth transplantation: Space closure after extraction of deciduous molars by use of orthodontic anchor screws : Mizukami K., Ko M., Shinkai Y., Tanne K., Tanimoto K.: *J. Chu-shi. Orthod. Soc.*, 32 (1), 25-38, 2020.
- 19 : Post-treatment Assessment of Extraction and Non-extraction Orthodontic Cases of a Set of Japanese Twins : Hirose N., Yanoshita M., Onishi A., Yamauchi Y., Nishiyama S., Kubo N., Takano M., Tsuboi E., Kunimatsu R., Tanimoto K.: *J. Hiroshima Univ. Dent. Soc.*, 52(1), 20-29, 2020.
- 20 : Lip support prosthesis for the patients after resection of oral floor cancer : Yoshikawa M., Yoshida M., Yamada S., Nagasaki T., Nobumoto T., Hamana T., Ishida F., Tanimoto K., Naito M., Kohada A., Tsunoda T., Ishida E., Tsuga K.: *J. Hiroshima Univ. Dent. Soc.*, 52(2), 90-93, 2020.

## B) Review (2020.1-2020.12)



## C) Publications (2020.1-2020.12)

- 1 : Treatment of open bite with TAD: The nature of molar intrusion and relapse : In Temporary anchorage devices in clinical orthodontics (Editor: Park JH.): Kaku M., Tanne K., Tanimoto K.: Wiley-Blackwell (New Jersey) , 309-318, 2020.
- 2 : 迷ったときの医者選び: 谷本幸太郎: 医療評価ガイド編集部 編: 南々社 (広島), 472-478, 2020.
- 3 : エナメル質再生法の開発とアメロゲニンペプチド創薬の探索: 化学工業 (化学工業社): 國松亮, 吉見友希, 谷本幸太郎: 化学工業社 (川崎), 292-295, 2020.
- 4 : 不正咬合: 睡眠学第2版 (日本睡眠学会): 上田宏: 朝倉書店 (新宿), 666-667, 2020.

## D) Other Publications (2020.1-2020.12)

- 1 : Tanimoto K. : Anatomy for dentists, Hiroshima University Shiragiku, 49, 29-30, 2020.

## E) Presentations at Scientific Meetings (2020.1-2020.12)

- 1 : Three cases of orthognathic surgical treatment of maxillary protrusion with deformity of the mandibular condyle : Ono S., Mizuta K., Yoshimi Y., Abe T., Uetsuki R., Nakagawa T., Tanimoto K., Takechi M.: The 30th Annual meeting of the Japanese Society for Jaw Deformities (Niigata), 2020.
- 2 : Semaphorin3A inhibits the inflammation induced by excessive mechanical stress in chondrocytes : Hirose N., Yanoshita M., Takano M., Nishiyama S., Onishi A., Kubo N., Asakawa Y., Tanimoto K.: 33rd Annual Meeting of The Japanese Society for the Temporomandibular Joint (Kyoto), 2020.
- 3 : Cyclic tensile strain upregulates pro-inflammatory cytokine expression via FAK-MAPK signaling in chondrocytes : Yanoshita M., Hirose N., Takano M., Nishiyama S., Tsuboi E., Onishi A., Yamauchi Y., Kubo N., Asakawa Y., Tanimoto K.: 33rd Annual Meeting of The Japanese Society for the Temporomandibular Joint (Kyoto), 2020.
- 4 : Statistical study of temporomandibular disorder in the orthodontic clinic, Hiroshima university hospital over the past 5 years : Onishi A., Hirose N., Asakawa Y., Awada T., Yanoshita M., Takano M., Yamauchi Y., Nishiyama S., Tsuboi E., Kubo N., Tanimoto K.: 33rd Annual Meeting of The Japanese Society for the Temporomandibular Joint (Kyoto), 2020.
- 5 : LILRB2 controls inflammation induced by ANGPTL2 in synovial cells : Nishiyama S., Hirose N., Yanoshita M., Takano M., Tsuboi E., Kubo N., Onishi A., Yamauchi Y., Tanimoto K.: 33rd Annual Meeting of The Japanese Society for the Temporomandibular Joint (Kyoto), 2020.
- 6 : Investigation of the caries risk test in Department of Orthodontics, Hiroshima University Hospital. : Kado I., Yoshimi Y., Kunimatsu R., Yamada S., Cynthia CM., Iwai K., Tanimoto K.: The 63rd Annual

Meeting of the Chu-Shikoku Orthodontic Society (Matsue), 2020.

- 7 : A case of Crouzon syndrome treated by Le Fort III plus Le Fort I osteotomy for the improvement of midface hypoplasia : Awada T., Kado I., Ando K., Yoshimi Y., Abe T., Ito S., Izumino J., So h., Koizumi Y., Nakano A., Ogasawara T., Rikitake K., Oda K., Tanimoto K.: The 61st Annual Meeting of the Chu-Shikoku Orthodontic Society (Matsue), 2020.
- 8 : A case of adolescent patient with cleft lip and palate treated by alveolar bone grafting and surgical orthodontic treatment : So H., Awada T., Yoshimi Y., Abe T., Ando K., Kado I., Ito S., Izumino J., Koizumi Y., Nakano A., Ogasawara T., Rikitake K., Oda K., Tanimoto K.: The 63rd Annual Meeting of the Chu-Shikoku Orthodontic Society (Matsue), 2020.
- 9 : Dental and occlusal changes after mandibular advancement splint therapy in Japanese OSA patients; long-term evaluation : Ueda H., Cynthia CM., Ishida E., Iwai K., Miura S., Kunimatsu R., Tanimoto K.: The 63rd Annual Meeting of the Chu-Shikoku Orthodontic Society (Matsue), 2020.
- 10 : Stem cell from human exfoliated deciduous teeth (SHED) conditioned media promotes bone regeneration : Hiraki T., Kunimatsu R., Nakajima K., Abe T., Tsuka Y., Tanimoto K.: The 44th Annual Meeting of the Japanese Cleft Palate Association (Nagoya), 2020.
- 11 : Comparison of characteristics between stem cells from human exfoliated deciduous teeth, human dental pulp stem cells and human bone marrow mesenchymal stem cells : Kunimatsu R., Nakajima K., Tsuka Y., Abe T., Hiraki T., Tanimoto K.: The 44th Annual Meeting of the Japanese Cleft Palate Association (Nagoya), 2020.
- 12 : An open bite case with temporomandibular disorders caused by a car accident ; a case report : Hirose N., Yanoshita M., Onishi A., Yamauchi Y., Nishiyama S., Takano M., Tsuboi E., Kubo N., Tanimoto K.: The 9th International Orthodontic Congress, The 12th Asian Pacific Orthodontic Congress, The 79th Annual Meeting of the Japanese Orthodontic Society (Yokohama), 2020.
- 13 : Relationship between salivation and skeletal morphology in Orthodontic Clinic in Hiroshima University Hospital : Yoshimi Y., Kado I., Yamada S., Okada M., Tokui F., Kunimatsu R., Tanimoto K.: The 9th International Orthodontic Congress, The 12th Asian Pacific Orthodontic Congress, The 79th Annual Meeting of the Japanese Orthodontic Society (Yokohama), 2020.
- 14 : 2-Methacryloyloxyethyl phosphorylcholine polymer reduces static friction and suppresses oral bacterial counts: An in vitro study : Tsuka Y., Kunimatsu R., Nakajima K., Sumi K., Yoshimi Y., Tanimoto K.: The 9th International Orthodontic Congress, The 12th Asian Pacific Orthodontic Congress, The 79th Annual Meeting of the Japanese Orthodontic Society (Yokohama), 2020.
- 15 : Effect of Nd:YAG laser irradiation and Mechanical force on cultured human osteoblasts : Tsuka Y., Kunimatsu R., Gunji H., Abe T., Cynthia CM., Hiraki T., Nakatani A., Sakata S., Tanimoto K. : The 9th International Orthodontic Congress, The 12th Asian Pacific Orthodontic Congress, The 79th Annual Meeting of the Japanese Orthodontic Society (Yokohama), 2020.
- 16 : Orthodontic anchorage with mini-screws; a retrospective review on clinical outcomes : Cynthia CM.,

- Kunimatsu R., Tsuka Y., Tanimoto K.: The 9th International Orthodontic Congress, The 12th Asian Pacific Orthodontic Congress, The 79th Annual Meeting of the Japanese Orthodontic Society (Yokohama), 2020.
- 17 : Three-dimensional model assessment of Cleft Lip and Palate Japanese patients after orthodontic treatment : Cynthia CM., Miura S., Ueda H., Kunimatsu R., Tanimoto K.: The 9th International Orthodontic Congress, The 12th Asian Pacific Orthodontic Congress, The 79th Annual Meeting of the Japanese Orthodontic Society (Yokohama), 2020.
- 18 : Familial cases with Hyper-IgE syndrome, Oral/maxillofacial features and Orthodontic treatment plan : Yanoshita M., Hirose N., Takano M., Onishi A., Yamauchi Y., Nishiyama S., Kagawa H., Tsuboi E., Kubo N., Asakawa Y., Tanimoto K.: The 9th International Orthodontic Congress, The 12th Asian Pacific Orthodontic Congress, The 79th Annual Meeting of the Japanese Orthodontic Society (Yokohama), 2020.
- 19 : Examination of the pharyngeal airway space and sleep-breathing changes post-mandibular setback : Iwai K., Ueda H., Matsumura Y., Cynthia CM, Miura S., Ishida E., Tanimoto K.: The 9th International Orthodontic Congress, The 12th Asian Pacific Orthodontic Congress, The 79th Annual Meeting of the Japanese Orthodontic Society (Yokohama), 2020.
- 20 : A case of surgical orthodontic treatment for a patient with osteogenesis imperfecta : Takano M., Asakawa Y., Hirose N., Tsuboi E., Nakatani A., Kunimatsu R., Tanimoto K.: The 9th International Orthodontic Congress, The 12th Asian Pacific Orthodontic Congress, The 79th Annual Meeting of the Japanese Orthodontic Society (Yokohama), 2020.
- 21 : The changes of oral microbiome caused by fixed orthodontic appliances : Kado I., Hisatsune J., Tsuruda K., Tanimoto K., Sugai M.: The 9th International Orthodontic Congress, The 12th Asian Pacific Orthodontic Congress, The 79th Annual Meeting of the Japanese Orthodontic Society (Yokohama), 2020.
- 22 : Oral and maxillofacial features of 3 rare congenital diseases uncovered by the Japanese National Health Insurance : Onishi A., Hirose N., Yamauchi Y., Yanoshita M., Takano M., Nishiyama S., Kagawa H., Tsuboi E., Kubo N., Tanimoto K.: The 9th International Orthodontic Congress, The 12th Asian Pacific Orthodontic Congress, The 79th Annual Meeting of the Japanese Orthodontic Society (Yokohama), 2020.
- 23 : The difference of cephalometric features between the past and present Japanese adults with normal occlusion : Yamauchi Y., Hirose N., Yanoshita M., Onishi A., Takano M., Nishiyama S., Kagawa H., Tsuboi E., Kubo N., Tanimoto K.: The 9th International Orthodontic Congress, The 12th Asian Pacific Orthodontic Congress, The 79th Annual Meeting of the Japanese Orthodontic Society (Yokohama), 2020.
- 24 : Effects of Human Full-length Amelogenin and C-terminal Amelogenin Peptide on the Proliferation of Human Mesenchymal Stem Cells Derived from Adipose Tissue : Ando K., Kunimatsu R., Yoshimi Y., Awada T., Tsuka Y., Sumi K., Abe T., Nakajima K., Tanimoto K.: The 9th International Orthodontic Congress, The 12th Asian Pacific Orthodontic Congress, The 79th Annual Meeting of the Japanese Orthodontic Society (Yokohama), 2020.
- 25 : Role of Semaphorin3A in endochondral ossification of mandibular condyle : Tsuboi E., Asakawa Y., Hirose N., Yanoshita M., Takano M., Nishiyama S., Kubo N., Onishi A., Yamauchi Y., Tanimoto K.: The 9th International Orthodontic Congress, The 12th Asian Pacific Orthodontic Congress, The 79th

- Annual Meeting of the Japanese Orthodontic Society (Yokohama), 2020.
- 26 : Dental and occlusal changes in Japanese OSA patients during mandibular advancement splint therapy: five years follow-up : Ishida E., Cynthia CM., Ueda H., Iwai K., Miura S., Kunimatsu R., Tanimoto K.: The 9th International Orthodontic Congress, The 12th Asian Pacific Orthodontic Congress, The 79th Annual Meeting of the Japanese Orthodontic Society (Yokohama), 2020.
- 27 : Comparative characterization of stem cells from human exfoliated deciduous teeth, dental pulp, and bone marrow-derived mesenchymal stem cells : Rikitake K., Kunimatsu R., Nakajima K., Ando K., Hiraki T., Tsuka Y., Abe T., N.A.R. Putranti., Tanimoto K.: The 9th International Orthodontic Congress, The 12th Asian Pacific Orthodontic Congress, The 79th Annual Meeting of the Japanese Orthodontic Society (Yokohama), 2020.
- 28 : Success rates in isolating mesenchymal stem cells from permanent and deciduous teeth : N.A.R. Putranti., Kunimatsu R., Nakajima K., Ando K., Hiraki T., Rikitake K., Tsuka Y., Abe T., Tanimoto K.: The 9th International Orthodontic Congress, The 12th Asian Pacific Orthodontic Congress, The 79th Annual Meeting of the Japanese Orthodontic Society (Yokohama), 2020.
- 29 : Changes in maxillofacial morphology in normal occlusion of Japanese adult : Yamauchi Y., Hirose N., Yanoshita M., Onishi A., Nishiyama S., Kagawa H., Kubo N., Yoshimi Y., Tanimoto K.: The 59th Hiroshima Prefectural Dental Association, The 104th Hiroshima University Dental Society (Hiroshima), 2020.
- 30 : Clinical and statistical study on non-syndromic oligodontia patients with six congenitally missing teeth in at Department of Orthodontics Hiroshima University Hospital : So H., Yoshimi Y., Awada T., Abe T., Kado I., Yashima Y., Ito S., Izumino J., Ogawa S., Kunimatsu R., Tanimoto K. : The 59th Hiroshima Prefectural Dental Association, The 104th Hiroshima University Dental Society (Hiroshima), 2020.
- 31 : Surveillance of ESBL-producing bacteria in Hiroshima Prefecture (2009-2019) : Sugai K., Ikeda M., Arai T., Hisatsune J., Kayama S., Komatsuzawa H., Sugai M., Ohge H.: Research Report Meeting of Hiroshima University Nosocomial Infectious Diseases Project Research Center (Hiroshima), 2020.
- 32 : Advanced stage tongue cancer patient with PEG and radiation treatment followed by rehabilitation leads to sustained oral food intake: a case report : Yamada S., Yoshikawa M., Yoshida M., Nagasaki T., Kanda T., Takahashi H., Fujishiro A., Kakimoto N., Tanimoto K.: The 59th Hiroshima Prefectural Dental Association, The 104th Hiroshima University Dental Society (Hiroshima), 2020.

#### F) Special lectures in academic meetings (2020.1-2020.12)

- 1 : Tanimoto K. : A new technology for orthodontic treatment - laser-assisted tooth movement - : 11th TIIKG International Scientific Meeting in Dentistry (Makassar), 2020.
- 2 : Tanimoto K. : Global dental education system in Hiroshima University School of Dentistry : Research meeting in Hasanuddin University, (Makassar), 2020.
- 3 : Tanimoto K. : Forefront of laser treatment-LLLT principle and effect : The academic seminar of Hiroshima Orthodontic Society 2019 (Hiroshima), 2020.
- 4 : Tanimoto K. : Treatment of malocclusion in the community - timing to start orthodontic treatment and determination of the difficulty - : 2nd academic seminar of Hiroshima Prefectural Dental Association (Hiroshima), 2020.

- 5 : Tanimoto K. : The Mechanism of Degenerative Changes in Temporomandibular Joint and Possible Approach for Orthodontic Treatment : The 9th International Orthodontic Congress, The 12th Asian Pacific Orthodontic Congress, The 79th Annual Meeting of the Japanese Orthodontic Society (Yokohama), 2020.
- 6 : Tanimoto K. : Treatment of Cleft Lip and/or Palate - A new strategy of bone Regeneration by use of Mesenchymal Stem Cells for Treatment of Jaw Cleft - : Stovit online series (SOS) (Surabaya), 2020.
- 7 : Hirose N. : The role of orthodontists on the clinical and research aspects of temporomandibular joint disorders : 33rd Annual Meeting of The Japanese Society for the Temporomandibular Joint (Kyoto), 2020.
- 8 : Yoshimi Y. : 広島大学病院唇顎口蓋裂総合成育医療センターの紹介 : 第 20 回日本における口唇裂・口蓋裂治療に関する多施設共同研究を考える会(Tokyo), 2020.

#### (4) Status of Receiving Grants-in Aid for Scientific Research, etc.

- 1 : Challenging Research (Exploratory) : Tanimoto K., Introduction of proteolytic enzyme into biomineralization process and its application to tooth enamel regeneration . 19K22717 . 2,990,000yen
- 2 : Grant-in-aid for Scientific Research (C) : Kunimatsu R., Application of cold laser to regeneration of periodontal tissue and pain relief during tooth movement. 19K10385. 1,430,000 yen
- 3 : Collaborative research with Maruzen Pharmaceuticals Co., Ltd. : Kunimatsu R., Evaluation of anti-inflammatory materials. 500,000 yen
- 4 : Collaborative research with GC Co., Ltd: Tanimoto K., Kunimatsu R., Investigation of Application to the Treatment of Cleft Palate with Cytorans Granule, a Carbonated Apatite Bone Prosthesis. 721,000yen.
- 5 : Grant-in-aid for Scientific Research(C) : Asakawa Y., Elucidation of the effect of Angptl2 on cartilage destruction of osteoarthritis and its application to novel therapies. 18K09833. 780,000 yen
- 6 : Grant-in-aid for Scientific Research(C) : Hirose N., Elucidation of mechanics of temporomandibular joint osteoarthritis and establishment of new therapeutic method with NFATc inhibitor. 19K10383. 1,430,000 yen
- 7 : Grant-in-aid for Scientific Research(C) : Yoshimi Y., Application of functional amelogenin peptides to bone organoid preparation and bone regeneration. 19K103840A. 1,170,000 yen
- 8 : Grant-in-Aid for Early-Career Scientists : Awada T., Development of orthodontic treatment using a combination of growth hormone replacement therapy and functional appliances. 19K192970A. 1,820,000 yen
- 9 : Grant-in-Aid for Early-Career Scientists : Abe T., Establishment of minimally invasive treatment for alveolar cleft with the application of exosomes of stem cells from human exfoliated deciduous teeth.

- 19K192690A. 2,080,000 yen
- 10 : Grant-in-Aid for Early-Career Scientists : Horie K., Elucidation of pathogenesis of associated pain in trapezius and sternocleidomastoid muscles associated with temporomandibular disorder. 19K19298. 2,210,000 yen
- 11 : Grant-in-Aid for Early-Career Scientists : Okita S., Activation of mature osteoblasts and an investigation of their bone regeneration ability. 18K17258. 1,170,000 yen
- 12 : Grant-in-Aid for Early-Career Scientists : Nakao Y., Elucidation of bone metabolism regulation mechanism by microRNA in bone matrix vesicles and application to efficient tooth movement. 19K19268. 910,000 yen
- 13 : Grant-in-Aid for Early-Career Scientists : Kimura A., Elucidation of periodontal tissue metabolic activity and its application to root resorption treatment by baicalin, flavonoid. 19K19270. 2,080,000 yen
- 14 : Grant-in-Aid for Early-Career Scientists : Yamamoto T., The effect of acetaminophen by COX inhibition for reduction of apical root resorption. 19K192960A. 1,820,000 yen
- 15 : Grant-in-aid for Scientific Research(Research Activity Start-up) : Kado I., The elucidation of change of oral ecosystem including dynamics of microbiome by orthodontic treatment and building a new prevention system. 19K24147. 1,430,000yen
- 16 : Grant-in-Aid for Scientific Research(C) : Tsuka Y., Optimal transplantation condition of stem cells from human exfoliated deciduous teeth and establishment of cleft palate regeneration therapy by cold laser. 20K10226. 1,430,000yen
- 17 : Grant-in-Aid for Early-Career Scientists : Gunji H., Elucidation of mechanism and treatment for osteoarthritis of temporomandibular joint applied photoactivation. 20K18759. 2,080,000yen
- 18 : Grant-in-Aid for Early-Career Scientists : Yamada S., Development of anti-bone destructive peptides based on lactoferrin research. 20K187580. 2,210,000yen
- 19 : Grant-in-Aid for Early-Career Scientists : Yanoshita M., Elucidation of interaction between FAK and autophagy and its application to therapies for temporomandibular joint osteoarthritis. 20K187812. 2,080,000yen
- 20 : Grant-in-Aid for Early-Career Scientists : Onishi A., Elucidation of the suppression mechanism of odontoclast activity by ameloblastin and therapeutic application for root resorption. 20K18782. 2,860,000yen
- 21 : Grant-in-Aid for Early-Career Scientists : Takano M., Elucidation of cartilage destruction mechanisms of ANGPTL2 enhancing the expression of MMPs and application to PCR treatment. 20K18783. 2,340,000yen
- 22 : Grant-in-Aid for Early-Career Scientists : Yashima Y., Elucidation of osteocytes dynamics mediated by Semaphorin 3A under mechanical stress. 20K18780. 1,560,000yen
- 23 : Grant-in-aid for Scientific Research(Research Activity Start-up) : Hiraki T., Analysis of bone

regeneration mechanism in stem cells from human exfoliated deciduous teeth (SHED) conditioned media and it's clinical application to jaw cleft bone regeneration treatment . 20K23055 .  
1,430,000yen

- 24 : Grant-in-aid for Scientific Research(Research Activity Start-up) : Yamauchi Y., Elucidation of cartilage destruction mechanism by low molecular weight hyaluronic acid via CD44 cross-linking inhibition and TLR4. 20K23056. 1,430,000yen

(5) Academic Awards, etc.

- 1 : Abe T. : Hiroshima University school of dentistry alumni association research encouragement prize 2020.

(6) Patents

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- **Department of Oral & Maxillofacial Radiology**
- **Division of Oral and Maxillofacial Surgery and Oral Medicine (Department of Oral and Maxillofacial Radiology)**

(1) Staff and Students

Professor	: Naoya Kakimoto
Associate Professor	: Takashi Nakamoto
Associate Professor/Lecturer	: Yoshikazu Suei
Assistant Professor	: Toshikazu Nagasaki, Masahiko Ohtsuka, Masaru Konishi, Verdonschot R.G.
Graduate Student	: Kiichi Shimabukuro, Pongsapak Wongratwanich

(2) Main Research Activities

- 1: Radiographic diagnosis of oral diseases
- 2: Radiographic study on mandibular osteomyelitis
- 3: Study of radiation dosimetry in X-ray region for diagnosis
- 4: Study on the videofluoroscopic examination of swallowing
- 5: Improvement of treatment results in the radiotherapy for oral cancers
- 6: Radiographic study to screen osteoporosis using panoramic radiographs of the jaw
- 7: Study on taste disorder with oral cancer patients after radiotherapy
- 8: Speech production in the human brain
- 9: Quantitative analysis of temporomandibular joint on MRI

(3) Research Achievements

A) Original Papers (including Case Reports)

- 1: Orthographic Properties of Distractors do Influence Phonological Stroop Effects: Evidence from Japanese Romaji Distractors. Yoshihara, M., Nakayama, M., Verdonschot, R.G., Hino, Y. & Lupker, S.: Memory & Cognition. doi: 10.3758/s13421-020-01103-8, 2020
- 2: Intraoral ultrasonographic features of tongue cancer and the incidence of cervical lymph node metastasis. Konishi, M., Fujita, M., Shimabukuro, K., Wongratwanich, P., Verdonschot, R.G., & Kakimoto, N.: Journal of Oral and Maxillofacial Surgery. doi: 10.1016/j.joms.2020.09.006, 2020
- 3: An investigation of tooth loss factors in elderly patients using panoramic radiographs. Konishi, M.,



- Verdonschot, R.G., & Kakimoto, N.: *Oral Radiology*. doi: 10.1007/s11282-020-00475-6, 2020.
- 4: Phonological encoding is free from orthographic influence: Evidence from a picture variant of the phonological Stroop task. Kinoshita, S. & Verdonschot, R.G. *Psychological Research*. doi: 10.1007/s00426-020-01315-2, 2020.
- 5: The Influence of Orthography on Speech Production: Evidence from Masked Priming in Word Naming and Picture Naming Tasks. Yoshihara, M., Nakayama, M., Verdonschot, R.G. & Hino, Y. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 46(8), 1570–1589. doi: 10.1037/xlm0000829, 2020
- 6: Sumacku or Smack? The value of analyzing acoustic signals when investigating the fundamental phonological unit of language production. Verdonschot, R.G. & Masuda, H.: *Psychological Research*. 84, 547–557. doi: 10.1007/s00426-018-1073-9, 2020.
- 7: The Time Course of Brain Activity in Reading Identical Cognates: An ERP Study of Chinese - Japanese Bilinguals. Xiong, K., Verdonschot, R.G., & Tamaoka, K.: *Journal of Neurolinguistics*. 55, 100911. doi: 10.1016/j.jneuroling.2020.100911, 2020.
- 8: Abstractness of human speech sound representations. Hestvik, A., Shinohara, Y., Durvasula, K., Verdonschot, R.G. & Sakai, H.: *Brain Research*, 1732: 146664. doi: 10.1016/j.brainres.2020.146664, 2020.
- 9: Computer-aided diagnosis system for osteoporosis based on quantitative evaluation of mandibular lower border porosity using panoramic radiographs. Nakamoto, T., Hatsuta, S., Yagi, S., Verdonschot, R. G., Taguchi, A., & Kakimoto, N.: *Dentomaxillofacial Radiology*, 49(4): 20190481. doi: 10.1259/dmfr.20190481, 2020.
- 10: Resorption of entire impacted maxillary primary canine by permanent successor. Matayoshi, S., Okawa, R., Nomura, R., Kakimoto, N., & Nakano, K. *Pediatric Dental Journal*, 30(3), 251-255. 2020
- 11: Surgical Sealing of Laterally Localized Accessory Root Canal with Resin Containing S-PRG Filler in Combination with Non-Surgical Endodontic Treatment: A Case Report. Hirata-Tsuchiya, S., Suzuki, S., Nakamoto, T., Kakimoto, N., Yamada, S., & Shiba, H. *Dent J (Basel)*, Nov 20;8(4):131. doi: 10.3390/dj8040131. 2020
- 12: Relationship between oral and nutritional status of older residents with severe dementia in an aged care nursing home. Konishi M., Kakimoto N. *Gerodontology*, 2020.11.27 published online.
- 13: Effects of perioperative oral care on postoperative inflammation following heart valve surgery. Nishi H., Takahashi S., Ohta K., Takamoto M., Shigeishi H., Go S., Obayashi T., Yoshioka Y., Konishi M., Shimizu Y., Yano K., Miyagawa T., Kakimoto N., Ohge H., Kawaguchi H., Kurihara H: *Oral Dis*, 2020.10.17 published online.
- 14: Association between stroke lesions and videofluoroscopic findings in acute stroke patients. Nakamori M, Hosomi N, Imamura E, Matsushima H, Maetani Y, Yoshida M, Yoshikawa M, Takeda C, Nagasaki T, Masuda S, Kayashita J, Tsuga K, Tanimoto K, Wakabayashi S,

Maruyama H: Journal of Neurology, doi.org/10.1007/s00415-020-10244-4, 2020.

- 15: Delayed Swallowing Reflex is Overlooked in Swallowing Screening Among Acute Stroke Patients. Takeda C, Yoshida M, DDS, Nakamori M, Hosomi N, Nagasaki T, Yoshikawa M, Kayashita J, Masuda S, Maruyama H, Tsuga K: Journal of Stroke and Cerebrovascular Diseases, 29(12), doi.org/10.1016/j.jstrokecerebrovasdis.2020.105303, 2020.

### C) Publications

- 1: 7 Videofluorography (VF) Chapter 1 Image diagnosis and normal anatomy: Image diagnostic atlas in dental clinical work 2<sup>nd</sup> ed: Edited by Japanese Society for Oral and Maxillofacial Radiology: Nagasaki, T., Kakimoto, N.: Ishiyaku Publishers, Inc. (Tokyo), 42-43, 2020.
- 2: 3 Cysts or Pseudocysts - developing cysts / odontogenic – 3. Lateral periodontal cyst. Chapter 3 Maxilla and mandibular disease: Edited by Japanese Society for Oral and Maxillofacial Radiology: Suei Y., Kakimoto, N.: Ishiyaku Publishers, Inc. (Tokyo), 74, 2020.
- 3: 9 Fibro-osseous lesion and giant cell lesion 3. Cement-osseous dysplasia. Chapter 3 Maxilla and mandibular disease: Edited by Japanese Society for Oral and Maxillofacial Radiology: Suei Y., Kakimoto, N.: Ishiyaku Publishers, Inc. (Tokyo), 100, 2020.

### E) Presentation at Scientific Meeting

- 1: A case of central giant cell granuloma in the mandibular condyle: Okuda, T., Ono, S., Tada, M., Ishida, F., Mizuta, K., Uetsuki, R., Kakimoto, N., Ogawa, I., Takechi, M.: The 38<sup>th</sup> Annual Meeting of Japanese Society of Oral Oncology (Tokyo), 2020.
- 2: Genes that fluctuate due to low dose rate radiation and hypoxic stimulation: Shimabukuro, K., Tanimoto, K., Kakimoto, N., Hirohashi, N.: The 45<sup>th</sup> Chugoku district Radiation Effect Study Group (Virtual and on-demand meeting), 2020.
- 3: A case of radiation pneumonitis caused by chemoradiotherapy after neck dissection of tongue cancer: Takahashi, H., Kanda, T., Tani, R., Toratani, S., Kakimoto, N., Okamoto, T.: The 65<sup>th</sup> Annual Meeting of Japanese Society of Oral and Maxillofacial Surgeons (Virtual and on-demand meeting), 2020.
- 4: A case in which oral intake was resumed by continuous rehabilitation for a patient with gastrostomy after interstitial brachytherapy for advanced tongue cancer: Yamada, S., Yoshikawa, M., Yoshida, M., Nagasaki, T., Kanda, T., Takahashi, H., Fujishiro, A., Kakimoto, N., Tanimoto, K.: The 104<sup>th</sup> Hiroshima University Dental Society (Hiroshima), 2020.
- 5: Activities of Center for Cause of Death Investigation Research and Education and Section of Forensic Odontology, Graduate School of Medical Sciences, Hiroshima University -2019 Summary Report-: Oka, H., Kouzai, K., Kakimoto, N., Fukumoto, W., Taniyama, D., Name, Y., Nagao, M., Awai, K., Yasui, W.:

The 104<sup>th</sup> Hiroshima University Dental Society (Hiroshima), 2020.

- 6: Progress report of Joint Research Committee WG3 (Imaging Evaluation of Oral Cancer DOI): Kobayashi T., Hayashi T., Tanuma J., Ogura I., Yuasa K., Arijii Y., Tomioka H., Konishi M.: Progress report of Joint Research Committee WG3 (Imaging Evaluation of Oral Cancer DOI) : The 38th Annual Meeting of Japanese Society of Oral Oncology (Tokyo), 2020.
- 7: Mandibular tumor: Sakamoto S., Ando T., Mizuta K., Ishida F., Kato D., Ono S., Konishi M., Miyauchi., Ogawa I.: The 31<sup>st</sup> Annual Meeting of the Japanese Society of Oral Pathology (Aichi)
- 8: The Effectiveness of Denture assistance for lip support on post operative oral floor cancer patients: Yamada S, Yoshida M, Yoshikawa, M, Ohada A, Kakuda T, Ishida E, Nagasaki T, Tsuga K: 2020 annual meeting of Japan Prosthodontic Society Chugoku-Shikoku branch (Virtual and on-demand meeting), 2020.
- 9: Outcome of remained swallowing disorder due to an odontogenic infection-related neck abscess: a case repor: Nagasaki T Yoshikawa M, Kawagoe M, Yamada S, Yoshida M, Otsuka M, Konishi M, Suei Y, Nakamoto T, Kakimoto N: The first annual autumn meeting of Japanese Society of Oral and Maxillofacial Radiology (Virtual and on-demand meeting), 2020.

#### F) Special lectures in academic meetings

- 1: Can Brachytherapy for Tongue Cancer Survive? From the standpoint of a dentist:Kakimoto, N.: The 44<sup>th</sup> Annual Meeting of Japan Society for Head and Neck Cancer (Virtual and on-demand meeting), 2020.
- 2: Brachytherapy: Kakimoto, N.: The 1st Autumn meeting of the Japanese Society for Oral and Maxillofacial Radiology (Virtual and on-demand meeting), 2020.
- 3: <sup>198</sup>Au grain brachytherapy for oral cancers: Konishi M: Hiroshima University Hospital Cancer Board Oncology Meeting (Hiroshima), 2020

#### (4) Status of Receiving Grants-in Aid for Scientific Research, etc.

- 1: Grant-in-aid for Scientific Research (C): Verdonschot, R.G., Novel insights from two key issues into kanji and kana processing. 20K00544, 1,040,000 JPY
- 2: General foundation Ryokufukai The year of 2020 education and research prize for encouragement (Grantfor young researcher grant): Shimabukuro K., Quantitative evaluation of temporomandibular joint by MRI T2 mapping -Comparison between two scanners in alongitudinal study-, 200,000 JPY
- 3: Grant-in-aid for Scientific Research (C): Kakimoto N., Normalization of high dose rate interstitial brachytherapy for oral cancer patients. 19K10289, 1,100,000 JPY
- 4: Grant-in-aid for Early-Career Scientists: Konishi M., Mechanism of taste dysfunction and

recovery after radiotherapy. 20K18807, 1,300,000 JPY

5: Joint research from Research Center for Radiation Disaster Medical Science: Konishi M. Study on the mechanism of taste disorder from radiation. 100,000JPY

#### (5) Academic Awards

1 : Sakamoto S., Ando T., Mizuta K., Ishida F., Kato D., Ono S., Konishi M., Miyauchi., Ogawa I.: Presentation award, The 31<sup>st</sup> Annual Meeting of the Japanese Society of Oral Pathology (Aichi)

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- **Department of Biological Endodontics**
- **Division of Preventive and Restorative Dentistry**
- Department of Endodontics and Operative Dentistry**

(1) Staff and Students

Professor: Hideki Shiba

Lecturer: Katsuhiko Takeda

Assistant Professor: Shizu Hirata-Tsuchiya, Noriko Saito, Satoru Shindo, Keiichi Akutagawa,  
Kazuma Yoshida, Jun, Nakanishi

Graduate Student: Satomi Shirawachi, Tomoki Kumagai, Naoki Sadaoka

International Research Student: Wang Chutian

(2) Main Research Activities

- 1: Studies on biological regeneration of dentin/pulp complex and periapical tissues
- 2: Studies on pulp regeneration by regulation of inflammation
- 3: Studies on biological obturation of root canals at apical areas

(3) Research Achievements

A) Original Papers (including Case Reports)

- 1: Surgical sealing of laterally localized accessory root canal with resin containing S-PRG filler in combination with non-surgical endodontic treatment: A case report: Hirata-Tsuchiya S., Suzuki S., Nakamoto T., Kakimoto N., Yamada S, Shiba H: Dent J (Basel)., 8: 131, 2020.
- 2: Semaphorin3A released from human dental pulp cells inhibits the increase in interleukin-6 and CXC chemokine ligand 10 production induced by tumor necrosis factor- $\alpha$  through suppression of nuclear factor- $\kappa$ B activation: Shindo S., Kumagai T., Shirawachi S., Takeda K., Shiba H.: Cell Biol Int., doi: 10.1002/cbin.11466. Epub 2020.
- 3: Aggressive periodontitis and NOD2 variants: Mizuno N., Kume K., Nagatani Y., Matsuda S., Iwata T., Ouhara K., Kajiya M., Takeda K., Matsuda Y., Tada Y., Ohsawa R., Morino H., Mihara K., Fujita T., Kawaguchi H., Shiba H., Kawakami H., Kurihara H.: J Hum Genet., 265: 841-846, 2020.

- 4: A small nuclear acidic protein (MTI-II, Zn<sup>2+</sup>-binding protein, parathymosin) attenuates TNF- $\alpha$  inhibition of BMP-induced osteogenesis by enhancing accessibility of the Smad4-NF- $\kappa$ B p65 complex to Smad binding element: Hirata-Tsuchiya S., Suzuki S., Okamoto K., Saito N., Yuan H., Yamada S., Jimi E., Shiba H., Kitamura C.: *Mol Cell Biochem.*, 469:133-142, 2020.
- 5: Optineurin regulates osteoblastogenesis through STAT1: Mizuno N., Iwata T., Ohsawa R., Ouhara K., Matsuda S., Kajiya M., Matsuda Y., Kume K., Tada Y., Morino H., Yoshimoto T., Ueki Y., Mihara K., Sotomaru Y., Takeda K., Munenaga S., Fujita T., Kawaguchi H., Shiba H., Kawakami H., Kurihara H.: *Biochem Biophys Res Commun.*, 525: 889-894, 2020.
- 6: A mandibular second molar with a middle mesial root canal: Nagahara T., Takeda K., Wada K., Shirawachi S., Iwata T., Kurihara H., Shiba H.: *Clin Case Rep.*, 8:1015-1020, 2020.
- 7: Clinical outcomes of post-exposure prophylaxis following occupational exposure to human immunodeficiency virus at Dental Departments of Hiroshima University Hospital: Shintani T., Iwata T., Okada M., Nakaoka M., Yamasaki N., Fujii T., Shiba H.: *Curr HIV Res.*, 18: 475-479, 2020.
- 8: Dentin phosphoprotein inhibits lipopolysaccharide-induced macrophage activation independent of its serine/aspartic acid-rich repeats: Nakanishi J., Suzuki S., Yoshida K., Hirata-Tsuchiya S., Haruyama N., Yamada S., Shiba H.: *Arch Oral Biol.*, 110: 104634, 2020.
- 9: Oral environment and taste function of Japanese HIV-infected patients treated with antiretroviral therapy: Shintani T., Fujii T., Yamasaki N., Kitagawa M., Iwata T., Saito S., Okada M., Ogawa I., Unei H., Hamamoto K., Nakaoka M., Kurihara H., Shiba H.: *AIDS Care*, 32: 829-834, 2020.
- 10: Periodontal ligament cells regulate osteogenesis via miR-299-5p in mesenchymal stem cells: Kaneda-Ikeda E., Iwata T., Mizuno N., Nagahara T., Kajiya M., Takeda K., Hirata R., Ishida S., Yoshioka M., Fujita T., Kawaguchi H., Kurihara H.: *Differentiation.*, Mar-Apr;112:47-57, 2020
- 11: Concordance study between regular face-to-face dental diagnosis and dental tediagnosis using fluorescence: Inquimbert C., Hirata-Tsuchiya S., Yoshii S., Molinari N., Nogue E., Roy C., Morotomi T., Washio A., Cuisinier F., Tassery H., Levalluis B., Kitamura C., Giraudeau N.: *J Telemed Telecare.*, 1357633X19894111, 2020.

## B) Review

- 1: Environmental improvement on and around the tooth stump for root canal treatment: Shiba H., Nagahara T., Taji T., Shirawachi S., Shindo S., Nakanishi J., Yoshida K., Akutagawa K., Saito N., Hirata-Tsuchiya S., Takeda K.: Jap. Endod. Assoc., 41: 155-164, 2020.

### C) Publications

- 1: Endodontic–periodontic lesion: Takeda K., Shiba H.: Must of difficult case (edited by Kitamura K.), Dental Diamond Co (Tokyo), 126-131, 2020.
- 2: A case report: Removal of a fractured file in a root canal using a microscope and an ultrasonic device: Nagahara T., Shiba H.: (edited by Abe O., Okiji T., Kinomoto Y., and Nakata K.), Nihonshikahyoron (Tokyo), 150-153, 2020.

### D) Other Publications

### E) Presentations at Scientific Meetings

- 1: Perforation repair and periodontal regeneration therapy in mandibular central incisor with cemental tear showed a favorable clinical outcome: Nagahara T., Takeda K., Shirawachi S., Iwata T., Wada K., Shiba H.: The 41th Annual scientific meeting of Japan Endodontic Association, Yamagata, held by the program abstracts, 2020.
- 2: A case report of localized severe chronic periodontitis treated with tooth transplantation and multiple periodontal surgical procedures: Nagahara Y., Takeda K., Shirawachi S., Iwata T., Shiba H.: The 152th Japanese Society of Conservative Dentistry, Osaka, held by the program abstracts, 2020.
- 3: A case report of invasive cervical resorption of maxillary central incisor: Takeda K., Shirawachi S., Tsuchiya S., Saito N., Shindo S., Akutagawa K., Yoshida K., Nakanishi J., Shiba H.: The 152th Japanese Society of Conservative Dentistry, Osaka, held by the program abstracts, 2020.
- 4: Proliferative and migratory actions of highly expressed MXRA5 in MSC: Yoshida K., Suzuki S., Nakanishi J., Hirata-Tsuchiya S., Yamada S., Shiba H.: The 152th Japanese Society of Conservative Dentistry, Osaka, held by the program abstracts, 2020.
- 5: Periodontal tissue destruction exacerbated by traumatic injury at an upper left central incisor with cemental tear: Nagahara T., Takeda K., Shiba H.: The 153th Japanese Society of Conservative Dentistry, Saitama, held online, 2020.
- 6: Effect of bone formation by drug repositioning of aspirin: Hirata-Tsuchiya S., Suzuki S., Nakanishi J., Takeda K., Shiba H.: The 153th Japanese Society of Conservative Dentistry, Saitama, held online, 2020.
- 7: Humoral factors secreted from periodontal ligament cells regulates osteogenesis via microRNA in mesenchymal stem cells: Iwata T., Ikeda E., Mizuno N., Nagahara T., Kajiya M., Takeda K., Yagi R.,

- Konishi A., Ouhara K., Fujita T., Kurihara H.: The 63rd Autumn Meeting of the Japanese Society of Periodontology, Koriyama, held online, 2020.
- 8: Diversity of numbers and morphology of tooth roots and root canals of a mandibular first premolar required for periodontal treatment and root canal treatment: Nagahara T., Takeda K., Wada K., Shiba H.: The 59th meeting of Hiroshima Prefectural Dental Association and 104th regular meeting of Hiroshima University Dental Society, Hiroshima, 2020.
- 9: Surgical sealing of non-accidental root perforation improves periapical periodontitis in maxillary central incisor: Hirata-Tsuchiya S., Takeda K., Shiba H.: The 59th meeting of Hiroshima Prefectural Dental Association and 104th regular meeting of Hiroshima University Dental Society, Hiroshima, 2020.
- 10: Efforts of dental hygienists at Hemophilia Treatment Center of Hiroshima University Hospital: Okada M., Shintani T., Kawagoe M, Iwata T, Takeda K, Shindou T, Yoshida K, Yamasaki N, Niizato N, Nakaoka M, Mizuno T, Fujii T, Oota K, Kozai K, Shiba H.: The 59th meeting of Hiroshima Prefectural Dental Association and 104th regular meeting of Hiroshima University Dental Society, Hiroshima, 2020.

#### F) Special lectures in academic meetings

- 1: Basic knowledge required for medical research presentations and case reports for humans: Shiba H.: 27th JEA seminar for specialized doctors (Held online), 2020.

#### (4) Status of Receiving Grants-in Aid for Scientific Research, etc.

- 1: Grants-in aid for scientific research (C): Katsuhiko Takeda: Development of a new conservative treatment of dental pulp using BDNF based on the regulation of pulp cell-macrophage cooperation. #20K09976, ¥1,300,000.
- 2: Grants-in aid for scientific research (C): Tsuchiya S. Development of hard tissue regeneration treatment through the regulation of estrogen signaling by the MTI-II. #20K09956, ¥1,430,000.
- 3: Grant-in-Aid for Early-Career Scientists: Akutagawa K. Elucidation of the improvement mechanism of both periodontitis and blood glucose level by HMGB1-RAGE axis control. #19K189981, ¥1,700,000.
- 4: Grant-in-Aid for Early-Career Scientists: Yoshida K. The research and applying regenerative therapy to pulp tissue of MXRA5 highly expressed in MSCs. #20K185110, ¥1,600,000
- 5: Grant-in-Aid for Early-Career Scientists: Nakanishi J. Development of conservative treatment of dental pulp applying hybrid recombinant Phosphoryn. #20K18510, ¥1,600,000.
- 6: Grant-in-Aid for Scientific Research (Start-up) Yoshida K. Establishment of novel endodontic therapy



using low cytotoxic agent, heparin-LL37 complex. #19K240960, ¥1,100,000

- 7: Research grants: Grants for research received from Hiroshima Prefecture: Study on network-construction of dental practice for HIV infection. ¥3,000,000

#### (5) Academic Awards, etc.

- 1: The encouragement award of the Japanese Conservative Dentistry 2020: Yoshida K. Reversible binding of heparin to high-dose LL37 eliminates its cytotoxicity with undiminished antimicrobial and LPS-neutralizing abilities.

#### (6) Patents

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- **Department of Pediatric Dentistry**
- **Division of Oral Health and Development  
(Department of Pediatric Dentistry)**

(1) Staff and Students

Professor : Katsuyuki Kozai

Associate Professor : Chieko Mitsuata

Research Associate : Meiko Tachikake, Noriko Niizato, Yuko Iwamoto, Yasumasa Irie, Masashi Nakano

Physician : Nao Kado

Graduate Student : Tomoko Ogasawara, Misa Takeyasu, Tatsuya Akitomo, Yuria Asao, Satoru Kusaka

Clinical Trainee : Fumiko Hayashi, Akira Yamane, Seiko Watanabe, Shoji Takahashi, Ami Okamine,  
Syuuhei Kaneko

(2) Main Research Activities

- 1 : Bacteriological research of onset mechanism and prevention of dental caries in children
- 2 : Research in oral environment and dental diseases in abused children
- 3 : Clinical research in oral care in children suffered from systematic diseases
- 4 : Evaluation of psychological stress in dental treatment in children
- 5 : 3-D analysis of dentition and occlusion in children
- 6 : Bacteriological research in periodontal diseases in children
- 7 : Investigation of oral status of Cambodian children

(3) Research Achievements

A) Original Papers (including Case Reports)

- 1 : The matrix vesicle cargo miR-125b accumulates in the bone matrix, inhibiting bone resorption in mice:  
Tomoko Minamizaki, Yuko Nakao, Yasumasa Irie, Faisal Ahmed, Shota Itoh, Nushrat Sarmin,  
Hirotaaka Yoshioka, Asako Nobukiyo, Chise Fujimoto, Shumpei Niida, Yusuke Sotomaru, Kotaro  
Tanimoto, Katsuyuki Kozai, Toshie Sugiyama, Edith Bonnelye, Yuichiro Takei, Yuji Yoshiko. :  
Commun Biol, 16; 3 (1): 30, 2020.
- 2 : Survey of New Preschool Patients with Dental Caries Visiting the Department of Pediatric Dentistry  
of Hiroshima University Hospital : Akitomo T., Asao Y., Iwamoto Y., Nakano M., Watanabe S.,  
Tatsukawa N., Mitsuata C., Kozai K. : The Japanese journal of pediatric Dentistry, 58 (1), 1-8, 2020.
- 3 : A Pediatric Patient with Prolonged Retention of Deciduous Teeth Caused by High IgE Syndrome: A  
Case Report: Takeyasu M., Tatsukawa N., Kado N., Akitomo T., Asao Y., Iwamoto Y., M., Mitsuata

- C., Kozai K.: The Japanese Journal of Pediatric Dentistry, 58 (1), 23-29, 2020.
- 4 : Clinical Investigation of Supernumerary Teeth at the Department of Pediatric Dentistry of University Hospital : Akitomo T., Asao Y., Iwamoto Y., Tachikake M., Niizato N., Sakurai K., Mitsuhata C., Kozai K. : Pediatric Oral and Maxillofacial Surgery, 30, 1, 15-19, 2020.
- 5 : A Model for School Dental Health Examination and Physical Examination in Cambodia -Bureau of international health cooperation in 2019-: Shimizu H., Toge T., Miyake M., Miyazaki R., Nonomura M., Iwamoto Y., Miyazaki A., Nomura M.: Journal of Kagawa University International Office, 11, 45-58, 2020.
- 6 : Annual Survey of New Preschool Patients with Dental Caries at the Department of Pediatric Dentistry of Hiroshima University Hospital : Akitomo T., Asao Y., Iwamoto Y., Kado N., Watanabe S., Mitsuhata C., Kozai K. : The Japanese journal of pediatric Dentistry, 58, 3, 99-106, 2020.
- 7 : Active sites of human MEPE-ASARM regulating bone matrix mineralization: Minamizaki T., Sakurai K., Hayashi I., Toshishige M., Yoshioka H., Kozai K., Yoshiko Y.: Molecular and cellular endocrinology, 517 (1), 2020.
- 8 : A new supernumerary tooth occurring in the same region during follow-up after supernumerary tooth extraction: A case report : Akitomo T., Asao Y., Mitsuhata C., Kozai K. : Pediatric Dental Journal, in press

## B) Review

## C) Publications

- 1 : Pediatric Dentistry Glossary second edition. The Japanese Society of Pediatric Dentistry: (Shared writing) Kozai K.: Ishiyaku Publisher, Inc., Tokyo, 2020.
- 2 : Today's Therapy in Pediatrics 17ed. Chapter 27. Diseases in Pediatric Dentistry and Oral Surgery, Haritosis, Breath odor, p885: (Shared writing) Kozai K.: Igaku-syoin Inc., Tokyo, 2020.

## D) Other Publications

- 1 : Health disparities seen from the state of childhood caries Direction of pediatric dentistry.: Kozai K.: Jpn. J. Clin. Dent. Child, 25(10), 18-28, 2020
- 2 : Children's teeth are dangerous-What is oral collapse?: Kozai K.: Child Health 23(8), 571-574, 2020.

## E) Presentations at Scientific Meetings

- 1 : Characteristics of *Streptococcus mutans* in children with severe dental caries : Mitsuhata C.,

- Nakano M., Irie Y., Kado N., Akitomo T., Asao Y., and Kozai K.: IADR2020 (98th general session and Exhibition of the IADR), Washington DC, 2020.
- 2 : Survey of New Preschool Patients with Dental Caries at Pediatric Dental Clinic of University Hospital in 2008, 2013 and 2018 : Akitomo T., Asao Y., Iwamoto Y., Mitsuhata C. Kozai K. : The 58th Congress of Japanese Society of Pediatric Dentistry (online), 2020.
  - 3 : Single-cell RNA-seq analysis uncovers the diversity of osteoblasts: Masashi Nakano, Katsuyuki Kozai: The 58th Congress of the Japanese Society of Pediatric Dentistry (online), 2020.
  - 4 : The oral microbiome analysis of children with Down syndrome : Kado N., Mitsuhata C., Kozai K.,: The 58th Congress of Japanese Society of Pediatric Dentistry (Online), 2020.
  - 5 : A Long-term Follow-up Case of Brothers with Compound Mutations-related Hypophosphatasia: Iwamoto Y., Miyake-Matsumoto N., Nakaoka M., Mitsuhata C., Kozai K.: IAPD20 Virtual Congress of the International Association of Paediatric Dentistry, 2020.
  - 6 : Detection of Dental and Oral Anomalies with Machine Learning: Comparison between Convolutional Neural Network and Random Forest: Nakamura K., Mine Y., Iwamoto Y., Takeda S., Mitsuhata C., Kozai K., Murayama T.: IAPD20 Virtual Congress of the International Association of Paediatric Dentistry, 2020.
  - 7 : The Effect of Oral Health Education to Teachers on Oral Health Condition of a Primary School Children in Cambodia: Asao Y., Iwamoto Y., Akitomo T., Mitsuhata C., Naito M., Kozai K.: IAPD20 Virtual Congress of the International Association of Paediatric Dentistry, 2020.
  - 8 : A New Supernumerary Tooth Occurring in Same Region during Follow-up after Supernumerary Tooth Extraction: A Case Report : Akitomo T., Asao Y., Mitsuhata C., Kozai K. : IAPD20 Virtual Congress of the International Association of Paediatric Dentistry, 2020.
  - 9 : A case of Amelogenesis Imperfecta which causative gene is recently revealed: Mitsuhata C., Mizuno N., and Kozai K.: IAPD20 Virtual Congress of the International Association of Paediatric Dentistry, 2020.
  - 10 : Questionnaire survey items that are effective for screening abused children for elementary school teachers: Niizato N., Kaihara Y., Sasahara H., Ueda Y., Kamikawa K., Yamasaki K., Kozai K.: The 5th Annual Conference of Japanese Dental Society for Prevention Child Abuse and Neglect (Osaka, Web), 2020.
  - 11 : A case of intentional replantation of immature permanent teeth with root fracture and extruded dislocation 2 months after injury: Asao Y., Mitsuhata C., Kanda T., Tachikake M., Toratani S., Kozai K.: The 59th Hiroshima Prefectural Dental Association / The 104th Hiroshima University Dental Society Regular Meeting (Hiroshima), 2020.
  - 12 : Activities of the Center for Education and Research on Causes of Death, Graduate School of Medical Sciences, Hiroshima University-2019 Summary Report:- Oka H., Kozai K., Kakimoto N., Taniyama D., Narajo A., Nagao M., Awai K., Yasui W.: 59th Hiroshima Dental Society, 104th

Hiroshima University Dental Society Regular Meeting (Hiroshima), 2020.

- 13 : Analysis of issues by our dental residents in remote work: Obayashi T., Nishi H., Munenaga, S., Shiba H., Kozai K., Kawaguchi H.: 59th Hiroshima Dental Society, 104th Hiroshima University Dental Society Regular Meeting (Hiroshima), 2020.
- 14 : Efforts of Dental Hygienists at Hiroshima University Hospital Hemophilia Clinic: Okada M., Shintani T., Kawagoe M., Iwata T., Takeda K., Shindo S., Yoshida K., Yamazaki N., Niizato, N., Nakaoka M., Mizuno T., Fujii T., Ota K., Kozai K., Shiba H.: 59th Hiroshima Dental Society, 104th Hiroshima University Dental Society Regular Meeting (Hiroshima), 2020.

#### F) Special lectures in academic meetings

- 1 : Current prevalence of dental caries and health disparities in Japanese children: Kozai K.:58th JSPD annual meeting, International Symposium: Jpn.J.Pediat. Dent. 58: 57-57 (Held in the magazine) , 2020.
- 2 : Workshop for improving the clinical level of pediatric dentistry: What is happening in pediatric dentistry now, Today's summary: Kozai K., Hiroshima Prefectural Dental Association (Hiroshima City), 2020 .10.4.
- 3 : Workshop for improving the clinical level of pediatric dentistry: Appropriate response to pediatric caries: Mitsuhashi C., Hiroshima Prefectural Dental Association (Hiroshima City), 2020 .10.4.
- 4 : Workshop for improving the clinical level of pediatric dentistry: Appropriate response when you suspect child abuse in dental practice, and techniques for treating children with developmental disabilities : Niizato N., Hiroshima Prefectural Dental Association (Hiroshima City), 2020 .10.4.
- 5 : Building a growing body to avoid injury in sports: Kozai K.: 31st Annual Meeting of the Japanese Academy of Sports Dentistry / Academic Conference:JMS Aster Plaza (Hiroshima), 2020.12.6.
- 6 : Workshop for improving the clinical level of pediatric dentistry: Pediatric Traumatic Dental Injuries and Pediatric Oral and Maxillofacial Surgery : Tachikake, M., Hiroshima Prefectural Dental Association (Hiroshima City), 2020 .12.13.
- 7 : Workshop for improving the clinical level of pediatric dentistry: Introduction of pediatric dentistry at Hiroshima University Hospital, Summary of pediatric dentistry clinical level up workshop and future of pediatric dentistry :Kozai K., Hiroshima Prefectural Dental Association (Hiroshima City), 2020 .12.13.
- 8 : School Dental Health Changes with Covid-19 Infection : Kozai K.:28th School Dental Health Research Conference in Hiroshima Prefecture: (held on the web), 2020.

#### (4) Status of Receiving Grants-in Aid for Scientific Research, etc.

- 1 : Grant-in-Aid for Early-Career Scientists: Iwamoto Y., Development of oral health education model for children in Cambodia and Southeast Asia (No.19K19330) 2020: direct expenses: ¥700,000, indirect expenses: ¥210,000.
- 2 : Grant-in-Aid for Scientific Research (C) : Kozai K., Elucidation of the prevention mechanism of dental caries in children by the TAS2R family of bitter taste receptors (No. 20K10203) 2020: direct expence ¥3,300,000, in direct expence ¥ 990,000.
- 3 : Grant-in-Aid for Scientific Research (C) : Niizato N., Survey on oral health condition and dental health behavior of abused children in shelter (No 17K11962) 2020: direct expence ¥1,100,000, in direct expence ¥ 330,000. (Carry over)

(5) Academic Awards, etc.

(6) Patents

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**Department of Dental Anesthesiology,  
Graduate School of Biomedical and Health Sciences and  
Department of Dental Anesthesiology,  
Division of Oral & Maxillofacial Surgery and Oral Medicine**

(1) Staff and Students

Professor	: Irifune Masahiro, D.D.S., Ph.D.
Lecturer	: Yoshida Mitsuhiko, D.D.S., Ph.D.
Research Associate	: Shimizu Yoshitaka, D.D.S., Ph.D., Doi Mitsuru, D.D.S., Mukai Akari, D.D.S., Ph.D., Oue Kana, D.D.S., Ph.D.
Resident	: Takahashi-Uno Tamayo, D.D.S., Ph.D., Yoshinaka Taiga, D.D.S., Ph.D., Kikuchi Yuka, D.D.S., Ph.D., Ogawa Yuya, D.D.S., Ph.D., Maetani Yuka, D.D.S., Ph.D., Mukai Tomohiro, D.D.S., Motoike-Imamura Serika D.D.S.
Graduate Student	: Kochi Takahiro, D.D.S., Sasaki Utaka, D.D.S., Imado Eiji, D.D.S.
Clinical Trainee	: Kawahara Michio, M.D., Ph.D., Kawahara Toshiya, D.D.S., Yasusaka Masaki, D.D.S., Oda Aya, D.D.S., Ph.D.

(2) Main Research Activities

- 1: Study on mechanisms of general anesthetic action
- 2: Development of a novel general anesthetic method applying enhancement of descending pain suppression system
- 3: Study on role of each neuron in an intravenous anesthetic agent-induced anesthetic factor
- 4: Study on a stage of delirium in general anesthesia
- 5: Study on involvement of dopamine neurons in awakening from general anesthesia
- 6: Study on antianxiety effects of sedative drugs
- 7: Study on effects of nitrous oxide on cardiovascular system
- 8: Study on chronic pain
- 9: Study on efficacy of chest compressions in cardiopulmonary resuscitation
- 10: Study on medical emergency during dental treatments

(3) Research Achievements

A) Original Papers (including Case Reports)

- 1: Simultaneous excision of tongue tumor and a thoracoscopic malignant lung tumor under general anesthesia: Imado E, Shimizu Y, Saeki N, Yoshinaka T, Oda A, Oue K, Mukai A, Doi M, Yoshida M, Irifune M: *Journal of Japanese Dental Society of Anesthesiology*. 48 (1), 19-21, 2020.
- 2: A clinic-statistical study of food consumption by patients with intellectual disabilities following third molar extraction under general anesthesia: Oda Y, Yoshida K, Furutani C, Oda A, Mukai T, Irifune M, Okada Y: *Journal of the Japanese Society for Disability and Oral Health*, 41 (1), 35-41, 2020.
- 3: A case of difficult ventilation during the induction of general anesthesia because of bronchospasm: Yoshinaka T, Mukai A, Takahashi T, Ogawa Y, Kochi T, Oda Y, Oue K, Doi M, Shimizu Y, Yoshida M, Irifune M: *Journal of Japanese Dental Society of Anesthesiology*, 48 (2), 81-83, 2020.
- 4: Research on current status and clinic-statistical analysis of intravenous sedation at special care dental clinic of Hiroshima University Hospital: Oda Y, Furutani C, Miyahara K, Miyazaki H, Oda A, Mukai T, Yoshinaka T, Imado E, Oue K, Takahashi T, Tokikazu T, Mizota Y, Mukai A, Irifune M, Okada Y: *The Journal of Hiroshima Dental Association*, 52 (1), 1-6, 2020.
- 5: The indirect  $\gamma$ -aminobutyric acid (GABA) receptor agonist gabaculine-induced loss of the righting reflex may inhibit the descending analgesic pathway: Ogawa Y, Irifune M, Mukai A, Shimizu Y, Doi M, Oue K, Yoshida M, Kanematsu T, Morioka N, Nakata Y, Sakai N: *Pharmacol Biochem Behav*. 198: 173034, 2020.
- 6: Component of nicotine-induced intracellular calcium elevation mediated through  $\alpha 3$ - and  $\alpha 5$ -containing nicotinic acetylcholine receptors are regulated by cyclic AMP in SH-SY 5Y cells: Takahashi T, Yoshida T, Harada K, Miyagi T, Hashimoto K, Hide I, Tanaka S, Irifune M, Sakai N: *PLoS One*. 15 (11): e0242349, 2020.

## B) Review

## C) Publications

## D) Other Publications

## E) Presentation at Scientific Meeting

- 1: Perineural treatment with anti-HMGB1 antibody alleviates nociceptive-like behaviors in mice with chronic constriction injury of distal infraorbital nerve: Kochi T, Nakamura Y, Nakashima K, Liu K, Waki H, Nishibori M, Irifune M, Morioka N: The 93rd Annual Meeting of the Japanese Pharmacological Society, in Yokohama City, Japan, March 16, 2020.
- 2: Functional regulation of serotonin transporter by SNARE protein Syntaxin 3: Motoike S, Taguchi K, Urabe T, Harada K, Hide I, Tanaka S, Irifune M, Sakai N: The 93rd Annual Meeting of the Japanese



- Pharmacological Society, in Yokohama City, Japan, March 17, 2020.
- 3: High mobility group box-1 induces trigeminal nerve neuropathy: Nakamura Y, Kochi T, Nakashima K, Liu K, Waki H, Nishibori M, Irifune M, Morioka N: The 140th Annual Meeting of the Pharmaceutical Society of Japan (Kyoto), 2020.
  - 4: Functional regulation of serotonin transporter by SNARE protein Syntaxin3: Motoike S, Irifune M: The 48th Annual Meeting of Japanese Dental Society of Anesthesiology (Tokushima), 2020.
  - 5: Analysis of breathing sound and dental apparatus noise generated from the airway during dental treatment under sedation: Oue K, Shimizu Y, Yoshinaka T, Irifune M: The 48th Annual Meeting of Japanese Dental Society of Anesthesiology (Tokushima), 2020.
  - 6: General care management of a hemodialysis patient with implantable cardioverter defibrillator during glossectomy: Mukai A, Yoshinaka T, Nitta K, Motoike S, Maetani Y, Ogawa Y, Takahashi T, Oue K, Doi M, Shimizu Y, Yoshida M, Irifune M: The 48th Annual Meeting of Japanese Dental Society of Anesthesiology (Tokushima), 2020.
  - 7: Perioperative management for a patient with sick sinus syndrome using percutaneous pacing due to intraoperative advanced bradycardia: Yoshinaka T, Mukai A, Imado E, Kochi T, Sasaki U, Mukai T, Kikuchi Y, Oue K, Doi M, Shimizu Y, Yoshida M, Irifune M: The 48th Annual Meeting of Japanese Dental Society of Anesthesiology (Tokushima), 2020.
  - 8: A case in which McGRATH™ MAC and a bronchofiberscope were useful for intubation of a patient with tracheal stenosis due to thyroid tumor: Kikuchi Y, Irifune M: The 48th Annual Meeting of Japanese Dental Society of Anesthesiology (Tokushima), 2020.
  - 9: Oral functional tests for patients with burning mouth syndrome: Doi M, Kitagawa M, Shintani T, Shiba H, Irifune M: The 13th Annual Meeting of Japanese Society for Evidence and the Dental Professional (Tokyo), 2020.
  - 10: A case report of cerebral palsy patient whose overdenture was applied with magnet attachment: Oda Y, Furutani C, Miyahara K, Miyazaki H, Takashima S, Wakida A, Watari M, Mizota Y, Kanda T, Yoshida K, Oda A, Mukai T, Suda S, Irifune M, Okada Y: The 37th Annual Meeting of the Japanese Society for Disability and Oral Health (Yokosuka city), 2020.
  - 11: A case of quantitative analysis of sleep bruxism using a temporal muscle electromyogram device in a patient with cerebral palsy: Oue K, Oda Y, Furutani C, Takahashi T, Yoshinaka T, Mukai A, Imado E, Mukai T, Oda A, Kikuchi Y, Kochi T, Yoshida M, Okada Y, Irifune M: The 37th Annual Meeting of the Japanese Society for Disability and Oral Health (Yokosuka city), 2020.
  - 12: The effects of general anesthetics and their adjuncts on substance P release from the spinal cord dorsal horn of rats: Analysis by *in vitro* and *in vivo* studies: Mukai T, Sasaki U, Imado E, Irifune M: The 59th Scientific Meeting of Hiroshima Prefecture Dental Association and 104th Scientific Meeting of Hiroshima University Dental Society (Hiroshima), 2020.
  - 13: A trial of swallowing function assessment by electronic stethoscope equipped with diagnosis system

using artificial intelligence technique: Oue K, Shimizu Y, Suzuki K, Oshimo S, Saeki N, Sadamori T, Tsutsumi Y, Shime N, Irifune M: 31th Annual Meeting of Japan Association for Clinical Monitoring (Tokyo), 2020.

- 14: Pretreatment with a high mobility group box-1 neutralizing antibody inhibits trigeminal neuropathy in rat: Nakamura Y, Kochi T, Nakashima K, Liu K, Waki H, Nishibori M, Irifune M, Morioka N: The 42nd Annual Meeting of Japanese Association for the Study of Pain (Tokyo), 2020.

#### F) Special lectures in academic meetings

#### (4) Status of Receiving Grants-in Aid for Scientific Research, etc.

- 1: Grant-in-Aid No. 18K09812 for Scientific Research (C) from the Ministry of Education, Culture, Sports, Science, and Technology of Japan (Continued): Irifune M, Kanematsu T: Development of a novel general anesthetic method of applying the enhancement of descending pain suppression system by stimulation of dopamine neurons in the nucleus accumbens. ¥650.
- 2: Grant-in-Aid No. 20K18669 for Young Scientists (B) from the Ministry of Education, Culture, Sports, Science, and Technology of Japan (New): Oue K: Study on interaction of obesity and periodontal disease on cognitive impairment. ¥1,300,000.
- 3: Grant-in-Aid No. 17K11908 for Scientific Research (C) from the Ministry of Education, Culture, Sports, Science, and Technology of Japan (Continued): Doi M: Functional brain imaging evaluation of treatment effect of cognitive behavioral therapy and antidepressant drugs on glossodynia. ¥500.

#### (5) Academic Awards, etc.

#### (6) Patents

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## Department of Public Oral Health

### (1) Staff and Students

Professor : Kouji Oota  
Associate Professor : Hideo Shigeishi  
Assistant Professor : Tomoko Maehara  
Graduate Student : Yoshino Kaneyasu (D3), Yoshimi Kawamura, Momoko Ishikawa, Mariko Nakamura (D1), Kanako Yano (M1)

### (2) Main Research Activities

- 1 : Study on Prevention for oral infection and oral complication of systemic diseases
- 2 : Study on efficacy of perioperative oral care on systemic diseases
- 3 : Study on human papillomavirus in oral squamous cell carcinoma
- 4 : Study on mechanism of oral mucosa against micro organism
- 5 : Study on efficacy of care program for elderly
- 6 : Study on development of new device and examination for oral hygiene management

### (3) Research Achievements

#### A) Original Papers (including Case Reports)

- 1 : Serum immunoglobulin G antibody titer to *Fusobacterium nucleatum* is associated with unfavorable outcome after stroke : Nishi H., Hosomi N., Ohta K., Aoki S., Nakamori M., Nezu T., Shigeishi H., Shintani T., Obayashi T., Ishikawa K., Kinoshita N., Shiga Y., Sugiyama M., Ohge H., Maruyama H., Kawaguchi H., Kurihara H. : *Clinical & Experimental Immunology*, 200(3), 302-309, 2020.
- 2 : High Rate of Oral Candida Detection in Dependent Japanese Older People : Matsumura M., Shigeishi H., Su CY., Nishimura R., Ohta K., Sugiyama M. : *Geriatrics (Basel)*, 5(1), pii: E21, 2020.
- 3 : Measurement of bristle splaying of toothbrushes using digital imaging and evaluation of plaque removal efficacy over 3 months: A randomized controlled trial (RCT). Kaneyasu Y., Shigeishi H., Maehara T., Fukada-Sambuichi E., Amano H., Sugiyama M. : *International Journal of Dental Hygiene*, 18(2), 173-181, 2020.
- 4 : Association of physical performance with oral function in older women participating in community-based health exercise programs. : Miyoshi S., Saito A., Shigeishi H., Sugiyama M. : *Clinical and Experimental Dental Research*, 6(3), 311-317, 2020.

- 5 : Melatonin-induced miR-181c-5p enhances osteogenic differentiation and mineralization of human jawbone-derived osteoblastic cells. : Murodumi H., Shigeishi H., Kato H., Yokoyama S., Sakuma M., Tada M., Ono S., Rahman MZ., Ohta K., Takechi M. : *Mol Med Rep*, 22(4), 3549-3558, 2020
- 6 : Morphological evaluation of bone by CT to determine primary stability – Clinical study. : Takechi M., Ishioka Y., Ninomiya Y., Ono S., Tada M., Nakagawa T., Sasaki K., Murodumi H., Shigeishi H., Ohta K. : *Materials (Basel)*, 13(11), E2605, 2020.
- 7 : Changes in the bristle stiffness of polybutylene terephthalate manual toothbrushes over 3 months: A randomized controlled trial. : Kaneyasu Y., Shigeishi H., Ohta K., Sugiyama M. : *Materials (Basel)*, 13(12), E2802, 2020.
- 8 : Oral human cytomegalovirus prevalence and its relationships with periodontitis and *Porphyromonas gingivalis* in Japanese adults: a cross-sectional study. : Nakamura M., Shigeishi H., Cheng-Yih SU., Sugiyama M., Ohta K. : *J Appl Oral Sci*, 2020;28:e20200501.
- 9 : Immune response to cytosolic DNA via intercellular receptor modulation in oral keratinocytes and fibroblasts. : Naruse T., Ohta K., Kato H., Ishida Y., Shigeishi H., Sakuma M., Fukui A., Nakagawa T., Tobiume K., Nishi H., Takechi M. : *Oral Dis*, 1-14,2020.
- 10 : Zoledronate Inhibits Osteoclast Differentiation via Suppressing Vascular Endothelial Growth Factor Receptor 2 Expression. : Nakagawa T., Ohta K., Uetsuki R., Kato H., Naruse T., Murodumi H., Yokoyama S., Sakuma M., Ono S., Takechi M. : *Biochem Genet*, 58(3), 473-489, 2020.
- 11 : TGF- $\beta$ 1 induces amoeboid-to-mesenchymal transition of CD44<sup>high</sup> oral squamous cell carcinoma cells via miR-422a downregulation through ERK activation and Cofilin-1 phosphorylation. : Yokoyama S., Shigeishi H., Murodumi H., Sakuma M., Kato H., Higashikawa K., Ohta K., Takechi M. : *Journal of Oral Pathology and Medicine*, 50(2), 155-164, 2020.
- 12 : Analysis of the factors associated with severity of oral mucositis in patients who received allogeneic hematopoietic stem cell transplantation: Ishikawa M., Shigeishi H., Nishi H., Sugiyama M., Ohta K. : *J. Hiroshima Univ. Dent. Soc*, 52(2), 1-7, 2020.
- 13 : Clinical Education Program for Oral Engineering Students (a Dental Technician Training Course) by the Department of Oral Health (Formerly Known as the Department of Preventive Dentistry) at Hiroshima University Hospital. : *J dent educ.*, 36(3), 150-160, 2020.

## B) Review

1 :

## C) Publications

1 :

## D) Other Publications

1 :

## E) Presentations at Scientific Meetings

- 1 : Association between oral HPV16 infection and periodontal disease related bacteria. : Shigeishi H., Nakamura M., Sugiyama M., Ohta K. : The 59th Meeting of Hiroshima Prefectural Dental Association/ The 104th Meeting of Hiroshima University Dental Society (Hiroshima), 2020.
- 2 : A study of the factors associated with severity of oral mucositis in pharyngeal cancer patients receiving chemoradiotherapy. : Nakamura M., Shigeishi H., Nishi H., Sugiyama M., Ohta K. : The 59th Meeting of Hiroshima Prefectural Dental Association/ The 104th Meeting of Hiroshima University Dental Society (Hiroshima), 2020.
- 3 : Relationship between change in the bristle stiffness of PBT toothbrush and bristle splaying. : Kaneyasu Y., Shigeishi H., Ohta K., Sugiyama M. : The 30th annual local meeting of Kinki-Chugoku-Shikoku Branch, Japanese Society for Oral Health (Paper), 2020.
- 4 : A study of the factors associated with severity of oral mucositis in pharyngeal cancer patients receiving chemoradiotherapy. : Nakamura M., Shigeishi H., Nishi H., Sugiyama M., Ohta K. : The 17th Annual Meeting of the Japan Society of Oral Care (Nagasaki), 2020.
- 5 : Association of oral and physical function with long-term participation in community-based health programs in older people. : Saito A., Miyoshi S., Yamane T., Miyamoto Y., Shigeishi H., Ohta K., Sugiyama M. : The 15th Annual Meeting of the Japan Society for Dental Hygiene (Paper) , 2020.
- 6 : Relationship between dietary diversity and oral function among older people participating in a community-based health exercise programs. : Miyoshi S., Saito A., Shigeishi H., Ohta K., Sugiyama M. : The 15th Annual Meeting of the Japan Society for Dental Hygiene (Paper), 2020.
- 7 : Recognition of *Candida albicans* cell wall and CEACAM1 expression in oral keratinocytes. : Sakuma M., Ohta K., Kato H., Fuku A., Naruse T., Shigeishi H., Takechi M. : The 74rd Annual Meeting of Japanese Stomatological Society(web), 2020.
- 8 : Recognition of *Candida* cell wall components by CEACAM1 against *Candida albicans* infection. : Sakuma M., Ohta K., Kato H., Naruse T., Ishida Y., Fukui A., Shigeishi H., Takechi M. : The 33<sup>th</sup> Annual Meeting of Japanese Society of Oral Diagnosis / Oral Medicine, The 30<sup>th</sup> Annual Meeting of Japanese Society of Oral Medicine, The 13<sup>th</sup> Annual Meeting of Japanese Society for Evidence and the Dental Professional(web), 2020.
- 9 : Evaluation of anti-tumor effect of anti-integrin agent, MK-0429. : Nakagawa T., Ohta K., Naruse T., Sakuma M., Ono S., Takechi M. : The 65th Congress of the Japanese Society of Oral and Maxillofacial

Surgeons(web), 2020.

- 10 : Recognition mechanism of Candida cell wall by CEACAM1 in oral keratinocytes. : Sakuma M., Ohta K., Kato H., Naruse T., Ishida Y., Fuku A., Shigeishi H., Takechi M. : The 65<sup>th</sup> Congress of the Japanese Society of Oral and Maxillofacial Surgeons(web), 2020.
- 11 : Clinical examination of factors influencing the results of treatment with intranasal residuals. : Ishioka Y., Ninomiya Y., Sasaki K., Yokoyama S., Suzuki E., Samejima K., Akagi M., Yamakado N., Fukada S., Okuda S., Sakuma M., Murodumi H., Kato H., Uetsuki R., Naruse T., Ishida Y., Ishida F., Fukui A., Tada M., Nakagawa T., Mizuta K., Ono S., Ohta K., Takechi M. : The 59th Meeting of Hiroshima Prefectural Dental Association/ The 104th Meeting of Hiroshima University Dental Society (Hiroshima), 2020.
- 12 : Characteristics of cases missed from dysphagia screening in acute stroke. : Takeda C., Hiraoka A., Mori T., Maehara T., Nishimura R., Yoshikawa M., Yoshida M., Tsuga K. : The 31th Annual Meeting of the Japanese Society of Gerodontology (web), 2020.
- 13 : The investigation of research direction in dental hygienists' students at our graduate school. : Maehara T., Matsumoto A., Nishimura R., Niitani Y., Naito M., Takemoto T. : The 11th Annual Meeting of the Japan Society for Dental Hygiene Education (web), 2020.

#### F) Special lectures in academic meetings

#### G) Contribution to Community

- 1 : Maehara T : Dental hygienist collaboration committee member of the Japanese Society for Disability and Oral Health, 2020.
- 2 : Nishimura R, Maehara T : Assessment of oral function at special nursing home "Kosei-En" (Hiroshima), 2020.

#### (4) Status of Receiving Grants-in Aid for Scientific Research, etc.

- 1 : Grants-in-Aid for Scientific Research (Scientific Research (C) : Shigeishi H (Main researcher) : Study on mechanotransduction mechanism of CD44<sup>high</sup> oral squamous cell carcinoma cells. (No. 20K10138).
- 2 : Grants-in-Aid for Scientific Research (Scientific Research (C) : Shigeishi H (Co- researcher): Study on the mechanisms of malignant transformation via gene methylation in HPV16-positive oral squamous cell carcinomas. (No. 18K097910A).
- 3 : Grants-in-Aid for Scientific Research (Scientific Research (C) : Ohta K (Main researcher): Functional analysis of novel candida cell wall component recognition receptor in oral mucosa and their significance in oral candidiasis. (No.20K10179).

- 4 : Grants-in-Aid for Scientific Research (Scientific Research (C) : Ohta K (Co-researcher):Construction of systemic complication prevention system in cancer chemotherapy targeting oral bacteria. (No. 20K10162).
- 5 : Grants-in-Aid for Scientific Research (Scientific Research (C) : Ohta K (Co-researcher):Effects of oral drug resistant bacteria distribution and dental hygiene management on medical long-term care-related pneumonia (No. 20K10248).
- 6 : Grants-in-Aid for Scientific Research (Scientific Research (C) : Ohta K (Co-researcher):Development of high functional porous hydroxyapatite with osteogenic and antibacterial activity. (No. 18K09790).
- 7 : Grants-in-Aid for Scientific Research (Scientific Research (C) : Ohta K (Co-researcher): Effects of perioperative oral function management by probiotics (No. 18K09880).

(5) Academic Awards, etc.

- 1 : Nakamura M : Study on association between oral herpes virus and periodontal disease-related bacteria. The grant from Satake Foundation, 2020.

(6) Patents

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## Department of Oral Epidemiology

### (1) Staff and Students

Professor : NAITO Mariko

Research Associate : NISHIMURA Rumi

Graduate Student : MAEHARA Tomoko

ASAEDA Mayuka

ARIMOTO Nishiki

YAMADA Sachiko

HAMA Yohko (Advanced Prosthodontics)

KOBAYASHI Teruo

YOSHITAKE Akari

ISHIZU Hanako

### (2) Main Research Activities

- 1 : Study on the methods for Oral health care
- 2 : Study on the education program for Oral health
- 3 : Study on the development of oral function
- 4 : Epidemiological studies regarding associations between oral health and general health
- 5 : Molecular epidemiology and gene-environmental interaction
- 6 : Associations between health screening behavior, health status and lifestyle
- 7 : Research for dysphagia patients and their caregivers
- 8 : QOL/PRO research

### (3) Achievements

#### A) Original Papers (including Case Reports)

- 1 : Measurement of bristle splaying of toothbrushes using digital imaging and evaluation of plaque removal efficacy over 3 months: A randomized controlled trial (RCT). : Kaneyasu Y., Shigeishi H., Maehara T., Fukada-Sambuichi E., Amano H., Sugiyama M. : Int J Dent Hyg, 18(2), 173-181, 2020.
- 2 : Clinical Education Program for Oral Engineering Students (a Dental Technician Training Course) by the Department of Oral Health (Formerly Known as the Department of Preventive Dentistry) at Hiroshima University Hospital. : J dent educ., 36(3), 150-160, 2020.



- 3 : Examination of the factor in conjunction with a self-affirmation and the anti-consciousness with others: Hama Y., Asaeda M., Hara K.: *Bulletin of Kobe Tokiwa University*, 13:93-99, 2020.
- 4 : High Rate of Oral Candida Detection in Dependent Japanese Older People. : Matsumura M, Shigeishi H, Cheng-Yih Su, Nishimura R, Ohta K, Sugiyama M. *Geriatrics (Basel)*. 5(1), 21,2020. doi: 10.3390/geriatrics5010021.
- 5 : Dental Hygienists in Japan: Sang-Hwan Oh, Nishimura R, Sugiyama M: *Journal of Dental Hygiene Science*, 20; 200-205, 2020.
- 6 : Effects of counseling education on dental hygiene students using the self-affirmation awareness scale.: Matsumoto A, Nishimura R, Fujiwara N.: *J Psychosomatic Oral Medicine*, 35, 5-12, 2020.
- 7 : Intranasal midazolam conscious sedation for dental surgery in child with left ventricular noncompaction : Miwa Miyauchi, Yohko Hama, Shigehiro Ono, Masaaki Takechi : *J Oral Maxillofac Surg Med Pathol*, 1–3, 2020 <https://doi.org/10.1016/j.ajoms.2020.09.014>
- 8 : Fujii R, Kondo T, Tsukamoto M, Kawai S, Sasakabe T, Naito M, Kubo Y, Okada R, Tamura T, Hishida A, Ueyama J, Hayashi Y, Ohnishi J, Hamajima N, Takeuchi K, Wakai K. Association of self-reported moderate vegetable juice intake with small decline in kidney function in a five-year prospective study. *Nutrition*. 2020 Dec 10;84:111114.
- 9 : Tamura T, Kuriyama N, Koyama T, Ozaki E, Matsui D, Kadomatsu Y, Tsukamoto M, Kubo Y, Okada R, Hishida A, Sasakabe T, Kawai S, Naito M, Takashima N, Kadota A, Tanaka K, Hara M, Suzuki S, Nakagawa-Senda H, Takezaki T, Shimoshikiryo I, Ikezaki H, Murata M, Oze I, Ito H, Mikami H, Nakamura Y, Kuriki K, Arisawa K, Uemura H, Takeuchi K, Wakai K. Association between plasma levels of homocysteine, folate, and vitamin B12, and dietary folate intake and hypertension in a cross-sectional study. *Sci Rep*. 2020 Oct 28;10(1):18499.
- 10 : Koyama S, Ito K, Terao C, Akiyama M, Horikoshi M, Momozawa Y, Matsunaga H, Ieki H, Ozaki K, Onouchi Y, Takahashi A, Nomura S, Morita H, Akazawa H, Kim C, Seo JS, Higasa K, Iwasaki M, Yamaji T, Sawada N, Tsugane S, Koyama T, Ikezaki H, Takashima N, Tanaka K, Arisawa K, Kuriki K, Naito M, Wakai K, Suna S, Sakata Y, Sato H, Hori M, Sakata Y, Matsuda K, Murakami Y, Aburatani H, Kubo M, Matsuda F, Kamatani Y, Komuro I. Population-specific and trans-ancestry genome-wide analyses identify distinct and shared genetic risk loci for coronary artery disease. *Nat Genet*. 2020 Nov;52(11):1169-1177.
- 11 : Shimoshikiryo I, Ibusuki R, Shimatani K, Nishimoto D, Takezaki T, Nishida Y, Shimanoe C, Hishida A, Tamura T, Okada R, Kubo Y, Ozaki E, Matsui D, Suzuki S, Nakagawa-Senda H, Kuriki K, Kita Y, Takashima N, Arisawa K, Uemura H, Ikezaki H, Furusyo N, Oze I, Koyanagi YN, Mikami H, Nakamura Y, Naito M, Wakai K; J-MICC Study Group. Association between alcohol intake pattern and metabolic syndrome components and simulated change by alcohol intake reduction: A cross-sectional study from the Japan Multi-Institutional Collaborative Cohort Study. *Alcohol*. 2020 Dec;89:129-138.

- 1 2 : Takeuchi K, Naito M, Kawai S, Tsukamoto M, Kadomatsu Y, Kubo Y, Okada R, Nagayoshi M, Tamura T, Hishida A, Nakatochi M, Sasakabe T, Hashimoto S, Eguchi H, Momozawa Y, Ikezaki H, Murata M, Furusyo N, Tanaka K, Hara M, Nishida Y, Matsuo K, Ito H, Oze I, Mikami H, Nakamura Y, Kusakabe M, Takezaki T, Ibusuki R, Shimoshikiryo I, Suzuki S, Nishiyama T, Watanabe M, Koyama T, Ozaki E, Watanabe I, Kuriki K, Kita Y, Ueshima H, Matsui K, Arisawa K, Uemura H, Katsuura-Kamano S, Nakamura S, Narimatsu H, Hamajima N, Tanaka H, Wakai K. Study profile of the Japan Multi-institutional Collaborative Cohort (J-MICC) Study. *J Epidemiol.* 2020 Sep 19.
- 1 3 : Matsunaga T, Naito M, Yin G, Hishida A, Okada R, Kawai S, Sasakabe T, Kadomatsu Y, Tsukamoto M, Kubo Y, Tamura T, Takeuchi K, Mori A, Hamajima N, Wakai K. Associations between peroxisome proliferator-activated receptor  $\gamma$  (PPAR- $\gamma$ ) polymorphisms and serum lipids: Two cross-sectional studies of community-dwelling adults. *Gene.* 2020 Dec 15;762:145019.
- 1 4 : Ishigaki K, Akiyama M, Kanai M, Takahashi A, Kawakami E, Sugishita H, Sakaue S, Matoba N, Low SK, Okada Y, Terao C, Amariuta T, Gazal S, Kochi Y, Horikoshi M, Suzuki K, Ito K, Koyama S, Ozaki K, Niida S, Sakata Y, Sakata Y, Kohno T, Shiraishi K, Momozawa Y, Hirata M, Matsuda K, Ikeda M, Iwata N, Ikegawa S, Kou I, Tanaka T, Nakagawa H, Suzuki A, Hirota T, Tamari M, Chayama K, Miki D, Mori M, Nagayama S, Daigo Y, Miki Y, Katagiri T, Ogawa O, Obara W, Ito H, Yoshida T, Imoto I, Takahashi T, Tanikawa C, Suzuki T, Sinozaki N, Minami S, Yamaguchi H, Asai S, Takahashi Y, Yamaji K, Takahashi K, Fujioka T, Takata R, Yanai H, Masumoto A, Koretsune Y, Kutsumi H, Higashiyama M, Murayama S, Minegishi N, Suzuki K, Tanno K, Shimizu A, Yamaji T, Iwasaki M, Sawada N, Uemura H, Tanaka K, Naito M, Sasaki M, Wakai K, Tsugane S, Yamamoto M, Yamamoto K, Murakami Y, Nakamura Y, Raychaudhuri S, Inazawa J, Yamauchi T, Kadowaki T, Kubo M, Kamatani Y. Large-scale genome-wide association study in a Japanese population identifies novel susceptibility loci across different diseases. *Nat Genet.* 2020 Jul;52(7):669-679.
- 1 5 : Matsunaga H, Ito K, Akiyama M, Takahashi A, Koyama S, Nomura S, Ieki H, Ozaki K, Onouchi Y, Sakaue S, Suna S, Ogishima S, Yamamoto M, Hozawa A, Satoh M, Sasaki M, Yamaji T, Sawada N, Iwasaki M, Tsugane S, Tanaka K, Arisawa K, Ikezaki H, Takashima N, Naito M, Wakai K, Tanaka H, Sakata Y, Morita H, Sakata Y, Matsuda K, Murakami Y, Akazawa H, Kubo M, Kamatani Y, Komuro I. Transethnic Meta-Analysis of Genome-Wide Association Studies Identifies Three New Loci and Characterizes Population-Specific Differences for Coronary Artery Disease. *Circ Genom Precis Med.* 2020 Jun;13(3):e002670.
- 1 6 : Akiyama M, Ishigaki K, Sakaue S, Momozawa Y, Horikoshi M, Hirata M, Matsuda K, Ikegawa S, Takahashi A, Kanai M, Suzuki S, Matsui D, Naito M, Yamaji T, Iwasaki M, Sawada N, Tanno K, Sasaki M, Hozawa A, Minegishi N, Wakai K, Tsugane S, Shimizu A, Yamamoto M, Okada Y, Murakami Y, Kubo M, Kamatani Y. Author Correction: Characterizing rare and low-frequency height-associated variants in the Japanese population. *Nat Commun.* 2020 Mar 9;11(1):1350.
- 1 7 : Niikura N, Nakatukasa K, Amemiya T, Watanabe KI, Hata H, Kikawa Y, Taniike N, Yamanaka T,

- Mitsunaga S, Nakagami K, Adachi M, Kondo N, Shibuya Y, Hayashi N, Naito M, Kashiwabara K, Yamashita T, Umeda M, Mukai H, Ota Y. Oral Care Evaluation to Prevent Oral Mucositis in Estrogen Receptor-Positive Metastatic Breast Cancer Patients Treated with Everolimus (Oral Care-BC): A Randomized Controlled Phase III Trial. *Oncologist*. 2020 Feb;25(2):e223-e230.
- 1 8 : Akashi A, Nakayama A, Kamatani Y, Higashino T, Shimizu S, Kawamura Y, Imoto M, Naito M, Hishida A, Kawaguchi M, Takao M, Matsuo M, Takada T, Ichida K, Ooyama H, Shinomiya N, Matsuo H. A common variant of LDL receptor related protein 2 (LRP2) gene is associated with gout susceptibility: a meta-analysis in a Japanese population. *Hum Cell*. 2020 Apr;33(2):303-307.
- 1 9 : Choda N, Wakai K, Naito M, Imaeda N, Goto C, Maruyama K, Kadomatsu Y, Tsukamoto M, Sasakabe T, Kubo Y, Okada R, Kawai S, Tamura T, Hishida A, Takeuchi K, Mori A, Hamajima N. Associations between diet and mental health using the 12-item General Health Questionnaire: cross-sectional and prospective analyses from the Japan Multi-Institutional Collaborative Cohort Study. *Nutr J*. 2020 Jan 9;19(1):2.
- 2 0 : Sato Y, Ochiai R, Ishizaki Y, Nishida T, Miura K, Taki A, Tani Y, Naito M, Takahashi Y, Yaguchi-Saito A, Hattori M, Nakayama T. Validation of the Japanese Transition Readiness Assessment Questionnaire. *Pediatr Int*. 2020 Feb;62(2):221-228.
- 2 1 : Nishida Y, Hachiya T, Hara M, Shimanoe C, Tanaka K, Sutoh Y, Shimizu A, Hishida A, Tsukamoto M, Kadomatsu Y, Oze I, Koyanagi YN, Kuriyama N, Koyama T, Ibusuki R, Takezaki T, Ikezaki H, Furusyo N, Takashima N, Kadota A, Uemura H, Katsuura-Kamano S, Suzuki S, Nakagawa-Senda H, Kuriki K, Mikami H, Nakamura Y, Momozawa Y, Kubo M, Nakatochi M, Naito M, Wakai K; Japan Multi-Institutional Collaborative Cohort Study Group. The interaction between ABCA1 polymorphism and physical activity on the HDL-cholesterol levels in a Japanese population. *J Lipid Res*. 2020 Jan;61(1):86-94.

## B) Review

None

## C) Publications

None

## D) Other Publications

- 1 : Implant treatment: The newest series of textbook for dental hygienist education -Basic theory and practical process for prosthodontic dentistry: Nishimura R(ed. By Akagawa Y, Suese K, Masui I, Aiba C and Yamada S): Ishiyaku Publishers,Inc (Tokyo): 197-204, 2020.

## E) Presentations at Scientific Meetings

- 1 : Relationship between frequency of lip incompetence and oral dysfunction: Kobayashi Y., Nakamura M., Hama Y., Asaeda M., Yoshida Y.: The 27th Annual Meeting of the Japanese Society of Health, Fitness and Nutrition (Takamatsu), 2020.
- 2 : Relationship between oral function and physical balance in older adults: Fukuda M., Nakamura M., Miyode M., Asaeda M., Yoshida Y.: The 27th Annual Meeting of the Japanese Society of Health, Fitness and Nutrition (Takamatsu), 2020.
- 3 : Research on incompetent lip seal "Okuchi-Pokan" and general health conditions; The first report: Nakamura M., Sone Y., Kobayashi Y., Asaeda M., Hama Y.: The 58th Annual Meeting of the Japanese Society of Pediatric Dentistry (Ginowan), 2020.
- 4 : Research on incompetent lip seal "Okuchi-Pokan" oriented towards oral dysfunction; The first report: Nakamura M., Kobayashi Y., Asaeda M., Hama Y., Yoshida Y.: The 29th Annual Meeting of Japanese Society of Dentistry for Medically Compromised Patient (publish), 2020.
- 5 : Effectiveness of Denture assistance for lip support on post operative oral floor cancer patients. Yamada S., Yoshida M., Yoshikawa M., Kohada A., Tsunoda T., Ishida E., Nagasaki T., Tsuga K. Japan Prosthodontic Society Chugoku&Shikoku Branch (Hiroshima), 2020.
- 6 : Advanced stage tongue cancer patient with PEG and radiation treatment followed by rehabilitation leads to sustained oral food intake: a case report. Yamada S., Yoshikawa M., Yoshida M., Nagasaki T., Kanda T., Takahashi H., Fujishiro A., Kakimoto N., Tanimoto K.: The 59th Scientific Meeting of Hiroshima Prefecture Dental Association and 104th Scientific Meeting of Hiroshima University Dental Society (Hiroshima), 2020.
- 7 : Outcome of remained swallowing disorder due to an odontogenic infection-related neck abscess: a case report.: Nagasaki T., Yoshikawa M., Kawagoe M., Yamada S., Yoshikawa M., Ohtsuka M., Konishi M., Verdonschot R., Suei Y., Nakamoto T., Kakimoto N.: The 1<sup>st</sup> Autumn Meeting of the Japanese Society for Oral and Maxillofacial Radiology(web), 2020.
- 8 : A Study on the Effectiveness of Training to Prevent Turnover of Dental Hygienists : Kurawaki Y, Aimi R, Nishimura R, Matsumoto A, Takemoto T, Naito M : The 61st General Meeting of Japanese Society of Dental Practice Administration (publish), 2020.
- 9 : Relationship between oral conditions and oral hygiene awareness in university freshmen: Asaeda M., Yoshida Y., Yanagita M., Yoshida N., Sugimoto K., Kubota A., Suzuki H., Yamanaka S., Sakamaki H., Okawa Y.: The 15th Annual Meeting of the Japan Society for Dental Hygiene (publish), 2020.
- 10 : Effects of joint practice of interprofessional education for dental hygiene students and nursing students: Sawada M., Ako K., Taniguchi Y., Asaeda M., Hara K.: The 15th Annual Meeting of the Japan Society for Dental Hygiene (publish), 2020.

- 1 1 : Research on lip closure in children attending health events and parental awareness of oral habits: Kobayashi Y., Nakamura M., Hama Y., Asaeda M., Yoshida Y.: The 15th Annual Meeting of the Japan Society for Dental Hygiene (publish), 2020.
- 1 2 : Training on prevention of periodontal diseases at the Center for Dental Hygienists' Education and Training, Hiroshima University.: Aimi R, Kurawaki Y, Matsumoto A, Nishimura R, Naito M, Takemoto T: The 15th Annual Meeting of the Japan Society for Dental Hygiene (publish), 2020.
- 1 3 : Overview of the Center for Dental Hygienists' Education and Training in the Project to Support the Return to Work of Dental Hygienists.: Kurawaki Y, Aimi R, Matsumoto A, Nishimura R, Naito M, Takemoto T.: The 15th Annual Meeting of the Japan Society for Dental Hygiene (publish), 2020.
- 1 4 : The relationship between periodontal disease and cognitive decline: A systematic review.: Hamakubo H, Sasaki K, Naito M, Nishimura R. : The 15th Annual Meeting of the Japan Society for Dental Hygiene (publish), 2020.
- 1 5 : Effect of lip-closure training on oral function.: Ishizu H, Nishimura R, Naito M.: The 15th Annual Meeting of the Japan Society for Dental Hygiene (publish), 2020.
- 1 6 : Effects of personality traits and willingness to act on continuing to use Interdental brush: Asaeda M., Nishimura R., Sambuichi E., Kanehisa Y., Kajita K., Hama Y.: The 31th Annual Meeting of the Japanese Society of Gerodontology (web), 2020.
- 1 7 : Characteristics of cases missed from dysphagia screening in acute stroke.: Takeda C, Hiraoka A, Mori T, Maehara T, Nishimura R, Yoshikawa M, Yoshida M, Tsuga K.: The 31th Annual Meeting of the Japanese Society of Gerodontology (web), 2020.
- 1 8 : Survey of participants in the Project to Support the Return to Work of Dental Hygienists. : Tsuruda K, Kurawaki Y, Aimi R, Misumi K, Tetsumori K, Daijyo A, Nishimura R, Matsumoto A, Naito M, Takemoto T. : The 31st general meeting of Kinki, Chugoku, Shikoku Society for Oral Health(publish),2020.
- 1 9 : The analysis of newspaper articles' reporting of oral frailty and frailty.: Taniguchi E, Nishimura R, Naito M.: The 79<sup>th</sup> Annual Meeting of Japanese Society of Public Health(web),2020.
- 2 0 : The Relationship between eating status, dysphagia symptoms, and quality of life in nursing homes elderly.: Yoshitake A, Naito M, Matsuda Y, Fujii K, Akifusa S, Suzukamo Y, Nishimura R.: The 79<sup>th</sup> Annual Meeting of Japanese Society of Public Health(web),2020.
- 2 1 : Efforts of the Center for Dental Hygienists' Education and Training, Hiroshima University in the Project to Support the Return to Work of Dental Hygienists. : Nishimura R, Kurawaki Y, Aimi R, Tsuruda K, Misumi K, Tetsumori K, Daijyo A, Nishimura R, Matsumoto A, Naito M, Takemoto T.: The general meeting of Chugoku Society for Dental Practice Administration (Hiroshima),2020.

- 2 2 : The investigation of research direction in dental hygienists' students at our graduate school. :  
Maehara T., Matsumoto A., Nishimura R., Niitani Y., Naito M., Takemoto T.: The 11th Annual Meeting of the Japan Society for Dental Hygiene Education (web), 2020.
- 2 3 : Examination of dental treatment under intravenous sedation for the elderly patient : Hama Y, Yoshida M, Tsuga K : The 31st Annual Meeting of the Japanese Society of Gerodontology (web),2020
- 2 4 : Effects of dental treatment related of special needs and their families' QOL: Hama Y, Miyauchi M, Oishi M, Okada S, Okino E, Shintani H, Naito M : The 37th Annual Meeting of the Japanese Society for Disability and Oral Health (web),2020
- 2 5 : An Experience in induction for dental treatment of the autism spectrum disorder with severe obesity: Oishi M, Okada S, Okino E, Hama Y, Shintani H , Miyauchi M: The 37th Annual Meeting of the Japanese Society for Disability and Oral Health (web),2020
- 2 6 : A study on the awareness of dental hygiene students for special needs dentistry and Dental Anesthesia: Comparison before and after a clinical training: Okada S, Oishi M, Okino E, Hama Y, Shintani H , Miyauchi M: The 37th Annual Meeting of the Japanese Society for Disability and Oral Health (web),2020
- 2 7 : A case of autism spectrum disorder patient who had a repeated practice of anesthetic induction.: Okino E, Okada S, Oishi M, Hama Y, Miyauchi M : The 48th Annual Meeting of the Japanese Society of Anesthesiology (web),2020
- 2 8 : The effect of oral health education to teachers on oral health condition of a primary school children in Cambodia: Asao Y., Iwamoto Y., Akitomo T., Mitsuhashi C., Naito M., Kozai K.: IAPD20 Virtual Congress(Online), 2020

## F) Lectures

- 1 : Asaeda M.: Dental counseling for infants: Child-care Support Center "Toki-wan Moto-roku" (Kobe), 2020.
- 2 : Asaeda M.: Dental counseling for infants: Child-care Comprehensive Support Facility "KIT" (Kobe), 2020.
- 3 : Nishimura R.: Oral Rehabilitation Society Advanced Course (Gwangju, Korea),2020.
- 4 : Nishimura R.: Aspiration prevention and oral care: Ujina Area Comprehensive Support Center (Hiroshima) ,2020.
- 5 : Nishimura R.: Oral care for Patients Undergoing Surgery: Refresher course for dental hygienists (Hiroshima) ,2020.
- 6 : Nishimura R.: Aspiration prevention and oral care: Ninoshima Area Comprehensive Support Center (Hiroshima) ,2020.

G) Social Contributions

- 1 : Maehara T : Dental hygienist collaboration committee member of the Japanese Society for Disability and Oral Health, 2020.
- 2 : Nishimura R, Maehara T : Assessment of oral function at special nursing home “Kosei-En” (Hiroshima), 2020.

(4) Status of Receiving Grants-in Aid for Scientific Research, etc.

- 1 : Asaeda M.: Kobe Tokiwa Junior College 2020 research expenses: Asaeda M(Co-Investigator): Development of the mastication instruction method using the wearable mastication counting device, ¥400,000.
- 2 : Asaeda M.: Kobe Tokiwa Junior College 2020 research expenses: Asaeda M(Co-Investigator): Development of an objective evaluation method for plaque score, ¥100,000.
- 3 : Grant-in-Aid for Young Scientists: Nishimura R (Principal Investigator): Is quantitative perceptual testing a screening test for dysphagia?. No. 18K17121. ¥1,100,000.

(5) Academic Awards, etc.

None

(6) Patents

None

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## Department of Anatomy and Functional Restorations

### (1) Staff and Students

Professor : Masato Kaku

Associate Professor : Saiji Shimoe

Graduate Students : Chao Fan Yi (Taiwan), Ayaka Koizumi

Undergraduate Student : Nanako Kajikawa, Tomomi Nakamura, Yukari Matsui, Mai Kato, Mona Shintani, Shiho Tendo, Hazumi Nakamoto, Yui Tamura, Momoyo Higo, Haruya Kawabata, Nozomi Kimura, Akie Nishimura, Miu Hirakawa, Kosuke Yamada, Kohei Yamamoto

Research Student : Shogo Iwaguro

### (2) Main Research Activities

- 1 : Effects of mechanical stress on bone metabolism and angiogenesis
- 2 : Tongue-palatal contact during articulation and swallow
- 3 : Study on dental materials for esthetic
- 4 : Study on new clinical application using novel dental ceramic
- 5 : Study on objective evaluation using the three-dimensional image

### (3) Research Achievements

#### A) Original Papers (including Case Reports)

- 1 : Yashima Y, Kaku M, Yamamoto T, Izumino Z, Kagawa H, Ikeda K, Shimoe S, Tanimoto K. 2020, Effect of continuous compressive force on the expression of RANKL, OPG, and VEGF in osteocytes. *Biomed Res-Tokyo*, 41:91-99.
- 2 : Izumino J, Kaku M, Yamamoto T, Yashima Y, Kagawa H, Ikeda K, Shimoe S, Tanimoto K. 2020, Effects of hyperbaric oxygen treatment on calvarial bone regeneration in young and adult mice. *Arch Oral Biol*, 117: 104828. doi: 10.1016/j.archoralbio.2020.104828.
- 3 : Kaku M, Kojima S, Yamamoto I, Yamamoto T, Kagawa H, Shimoe S, Tanimoto K. 2020 in press, An investigation of tongue-palatal contact changes in patients with skeletal mandibular lateral deviation after sagittal split ramus osteotomy. *J Craniofac Surg*, 2020, doi: 10.1097/SCS.0000000000006796.
- 4 : Shimoe S. 2020, Symposium II The current situation of education for dental technology and the future prospects, The basic field, "Human and life". *J Nippon Academy of Dental Technology*, 41:35-38.
- 5 : Takenaka H, Shimoe S, Iwaguro S, Fukui J, Kaku M. 2020, Analysis of dimensional change of dental materials on the process of fabricating inlays using three-dimensional data. *J Nippon Academy of Dental Technology*, 41:123-131.
- 6 : Tzu-Yu Peng, Yuki Ogawa, Hiroyuki Akebono, Shogo Iwaguro, Atsushi Sugeta, Saiji Shimoe. 2020, Finite-element analysis and optimization of the mechanical properties of polyetheretherketone (PEEK) clasps for removable partial dentures: *Journal of Prosthodontic Research*: 64, 250-256.
- 7 : Saiji Shimoe, Tzu-Yu Peng, Yuki Wakabayashi, Hiroto Takenaka, Shogo Iwaguro, Masato Kaku. 2020,



Laser-Milled Microslits Improve the Bonding Strength of Acrylic Resin to Zirconia Ceramics: *Polymers*, 12, 817, doi:10.3390/polym12040817.

- 8 : Saiji Shimoe, Tzu-Yu Peng, Mai Otaku, Nozomi Tsumura, Shogo Iwaguro, Takahiro Satoda. 2020, Color accuracy of different types of monolithic multilayerprecolored zirconia ceramics. *The Journal of Prosthetic Dentistry*, 124, 789.e1-789.e7.

## B) Review

## C) Publications

- 1 : Kaku M, Tanne K, Tanimoto K. 2020, Treatment of open bite with TAD: The nature of molar intrusion and relapse. In *Temporary anchorage devices in clinical orthodontics* (Editor: Park JH.). Wiley-Blackwell, Hoboken, New Jersey, 309-318.
- 2 : Tanne K., Ohtani J., Sunagawa H., Kaku M., Fujita T. : Treatment of Class II open bite malocclusion supported by skeletal anchorage. In: *Skeletal Anchorage in Orthodontic Treatment of Class II Malocclusion – Contemporary application of orthodontic implants, miniscrew implants and miniplates* (Editor: Moschos M. Papadopoulos). Mosby Elsevier, London, New York, Toronto etc, 235-238, 2014~
- 3 : Tanne K., Tanaka E., Kaku M., et al. : *Comprehensive dental care for orthodontics -basic technology and development-*. Tokyo RinshoShuppan, (Tokyo), 2005~
- 4 : Kawata T., Kaku M., Owada T.: Safety and high quality of IPS cells manufacture. –Cryopreservation and transportation of IPS cells.: Technical Information Institute Co. LTD, 2016~
- 5 : The newest series of textbooks for dental technologist-Dental Materials Science: Takayuki Yoneyama, Nikawa Hiroki, Saiji Shimoe, Hideo Matsumura, Hideyuki Imai et al, Ishiyaku Publishers, Inc (Tokyo), 201, 2016~.
- 6 : The newest series of textbooks for dental technologist-Dental Technology for Fixed Dental Protheses and Restoration: Hideo Matsumura, Yasushi Kumono, Saiji Shimoe, Kazuhiko Suese et al, Ishiyaku Publishers, Inc (Tokyo), 181, 2017~.
- 7 : The newest series of textbooks for dental technologist-Practice of Dental Technology: Tateo Ozaki, Masahiro Kuwata, Saiji Shimoe, Hiroyuki Miura, Takeshi Murayama et al, Ishiyaku Publishers, Inc (Tokyo), 215, 2017~.
- 8 : The Newest Series of Textbooks for Dental Technologist - Dental Technology for Fixed Dental Protheses and Restorations (Book language: Traditional Chinese): Hideo Matsumura, Kazuhiko Suese, Akio Shintani, Saiji Shimoe, Hideyuki Imai, et al, Ho-Chi Book Publishing (Taiwan), Total of 182 pages, 2018~
- 9 : The Newest Series of Textbooks for Dental Technologist - Oral and Maxillofacial Anatomy (Book language: Traditional Chinese): Tzu-Yu Peng (Sole Translator), Ho-Chi Book Publishing (Taiwan), Total of 208 pages, 2019. (ISBN: 9789863682592)

- 10 : The Newest Series of Textbooks for Dental Technologist - Dental Technology for Removable Dentures (Book language: Traditional Chinese): Tzu-Yu Peng (Sole Translator), Ho-Chi Book Publishing (Taiwan), Total of 308 pages, 2019. (ISBN:9789863683094)

#### D) Other Publications

#### E) Presentation at Scientific Meeting

- 1 : Tongue-palatal contact changes during swallowing in patients with skeletal deformities after orthognathic surgery. Kaku M: The 6<sup>th</sup> EPG Symposium (Osaka), 2020.
- 2 : The production of the prosthetic titanium device with a little failure, from a design to a delivery. Shimoe S : The 42<sup>nd</sup> the meeting of the Nippon Academy of Dental Technology, 2020.
- 3 : Bonding properties of acrylic resin to zirconia and polyaryletherketone (PAEK): Tzu-Yu Peng, Saiji Shimoe, Dan-Jae Lin, Masato Kaku: 68th Annual Meeting of Japanese Association for Dental Research (JADR) (Online), November 7-21, 2020.

#### (4) Status of Receiving Grants-in Aid for Scientific Research, etc.

#### (5) Academic Awards, etc.

- 1 : Yuka Nishi : The 22<sup>nd</sup> Student's Carving Contest, Gold Award, 2020.3.23
- 2 : Momoyo Higo : The 22<sup>nd</sup> Student's Carving Contest, Silver Award, 2020.3.23

#### (6) Patents

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## Program of Oral Health Sciences

### Department of Medical System Engineering

#### (1) Staff and Students

Professor	: Takeshi Murayama
Lecturer	: Yuichi Mine
Researcher	: Chika Nakashima
Graduate Student	: Memori Minoda, Riho Kawaguchi, Kousei Tabira, Kentaro Nakamura, Saori Takeda, Reina Yoshioka
Graduation Research Students	: Mari Fujii, Yukine Ashikari, Shiho Urabe, Yuuki Sasaki, Akari Tanaka, Saki Nishibayashi, Momo Hiraoka, Mai Utsunomiya, Satori Undo, Mami Kato, Nana Kurogi, Keiki Tanioka, Saki Tokuhara, Saki Fujimoto, Hiroki Hase

#### (2) Main Research Activities

- 1: Application of manufacturing system technologies (e. g., CAD/CAM, 3-d printing) to dentistry
- 2: Application of artificial intelligence to dentistry
- 3: 3-d modeling and computer simulation in dentistry
- 4: Simulation-based analysis of work processes in dental technology
- 5: Study on mechanisms of anti-resorptive agents-related osteonecrosis of the jaw (ARONJ)
- 6: Anti-resorptive agents for postmenopausal breast cancer
- 7: Translational research

#### (3) Research Achievements

##### A) Original Papers (including Case Reports)

- 1: Applying deep learning approach to maxillofacial prostheses coloration: Mine Y, Suzuki S, Eguchi T, Murayama T: Journal of Prosthodontic Research 64(3):296-300. 2020
- 2: Establishment of Translational Science and Medicine Training Program in Japan: Nii T, Sittampalam GS, Mine Y, Sugiyama D: Translational and Regulatory Sciences 2(2): 36-41. 2020
- 3: Establishing a translational research network in the Asia-Pacific Region through Industry-Academia-Government Collaboration: The Japan Medical Innovation Program: Nii T, Swain A, Mine Y, Yumine A, Sugiyama D: Translational and Regulatory Sciences 2(2):42-46. 2020
- 4: Comprehensive analysis of transcriptional profiling in oral epithelial-like cells stimulated with oral

- probiotic *Lactobacillus* spp.: Endo K, Mine Y, Shuto T, Taji T, Murayama T, Nikawa H: Archives of Oral Biology 118:104832. 2020
- 5: Accuracy Evaluation of a Three-Dimensional Model Generated from Patient-Specific Monocular Video Data for Maxillofacial Prosthetic Rehabilitation: A Pilot Study: Matsuo M, Mine Y, Kawahara K, Murayama T: Journal of Prosthodontics 29(8):712-717. 2020
  - 6: Cytotoxicity assay using human pluripotent stem cell-derived cranial neural crest cell model: Mine Y, Suga M, Mimura S, Minoda M, Murayama T, Nikawa H, Furue MK: In Vitro Cellular & Developmental Biology – Animal 56(7):505-510. 2020
  - 7: Landmark annotation and mandibular lateral deviation analysis of posteroanterior cephalograms using convolutional neural network: Takeda S, Mine Y, Yoshimi Y, Ito S, Tanimoto K, Murayama T: Journal of Dental Sciences in press

## B) Review

- 1: Digital dentistry -A new world opened up by AI and 3D printers-: Murayama T, Mine Y: The Journal of Chu-shikoku Orthodontic Society 32(1): 3-8. 2020

## C) Publications

## D) Other Publications

## E) Presentation at Scientific Meeting

- 1: Establishment and Activities of the Translational Research Center, Hiroshima University: Shigemoto N, Sugiyama D, Mine Y, Kisaka T, Kurosaki T, Matsuura Y, Sako H, Takahashi H, Tanaka K, Amagase H, Kihara Y, Kurisu K: The 11th General Session of Japan Society of Clinical Trials and Research (Tokyo) 2020
- 2: Development of novel implant osseointegrated-mice model with superstructure-like region: Hiraoka M, Mine Y, Minoda M, Nikawa H, Murayama T: The 75th General Session of the Japanese Society for Dental Materials and Devices (Nagano) 2020
- 3: Evaluation of titanium surface properties brushed with different toothbrush bristles: Urabe S, Shuto T, Murayama T, Mine Y: The 75th General Session of the Japanese Society for Dental Materials and Devices (Nagano) 2020
- 4: Detection of Dental and Oral Anomalies in Children Using Deep Learning Approach: Takeda S, Mine Y, Eguchi T, Murayama T: The 11th Annual Conference of Japan Academy of Digital Dentistry (Nagoya) 2020
- 5: Evaluation of BRONJ-like region in bisphosphonate-medicated mice with hyperocclusive state: Mine Y, Minoda M, Yoshioka R, Makihira S, Nikawa H, Murayama T: The 129th Annual Meeting of the Japan Prosthodontic Society (Fukuoka) 2020
- 6: Comprehensive analysis of gene expression profiling in oral epithelial-like cells stimulated with oral probiotic *Lactobacillus* spp.: Yumisashi Y, Mine Y, Shuto T, Nikawa H: The 129th Annual Meeting of the Japan Prosthodontic Society (Fukuoka) 2020
- 7: Detection of Dental and Oral Anomalies with Machine Learning: Comparison between Convolutional

- Neural Networks and Random Forest: Nakamura K, Mine Y, Iwamoto Y, Takeda S, Mitsuhata C, Kozai K, Murayama T: IAPD20 Virtual (International Association of Paediatric Dentistry) (Virtual Meeting) 2020
- 8: Examination of PDGFR pathway as a new target for malignant mesothelioma treatment: Suehiro T, Nguyen Hoang T. D., Mine Y, Fujii M: The 79th Annual Meeting of the Japanese Cancer Association (Hiroshima) 2020
  - 9: Regulation of mesothelioma cell proliferation by connective tissue growth factor via membrane-bound inhibitor expression: Nguyen HTD, Suehiro T, Mine Y, Fujii M: The 79th Annual Meeting of the Japanese Cancer Association (Hiroshima) 2020
  - 10: Lansoprazole Delays Extraction Socket Healing in Bisphosphonate-medicated Mice: Yoshioka R, Mine Y, Nikawa H, Murayama T: The 34th Annual Scientific Meeting of International Association of Dental Research - South East Asia Division (IADR-SEA) (Bangkok) 2020

## F) Special Lectures in Academic Meetings

### (4) Status of Receiving Grants-in Aid for Scientific Research, etc.

- 1: KOSE COSMETOLOGY RESEARCH FOUNDATION: (Principal Investigator) Mine Y, Development of innovative maxillofacial prosthesis fabricating system applying deep learning
- 2: KAKENHI Grant-in-Aid for Young Scientists: (Principal Investigator) Mine Y, Hyperocclusive state and MRONJ, Grant Number 20K18604.
- 3: KAKENHI Grant-in-Aid for Scientific Research (B): (Co-Investigator) Mine Y, Development of Multidisciplinary Therapy for Oral Mucosa Malignant Melanoma, Grant Number 19H03826.
- 4: KAKENHI Grant-in-Aid for Scientific Research (C) : (Co-Investigator) Mine Y, HiPIMS-DLC for Peri-implantitis Control, Grant Number 20K10053.
- 5: KAKENHI Grant-in-Aid for Scientific Research (C) : (Co-Investigator) Mine Y, Development of a Novel Root Surface Caries Preventive Agent to Reduce Tooth Loss in the Elderly, Grant Number 20K10260.

### (5) Academic Awards, etc.

### (6) Patents

## Department of Oral Biology & Engineering

### (1) Staff and Students

Professor : Hiroki Nikawa

Associate Professor : Tsuyoshi Taji

Lecturer : Hisako Sasahara

Education and Research Support Staff : Kaori Taguchi

Research Student : Kazuko Kawahara

Graduate Student : Yukihiro Takayama, Satoshi Miyauchi, Tomoya Suehiro, Rei Ito,  
Honami Oki, Akari Kumagai, Kouhei Matsushima, Misa Hamaoka,  
Yoshie Yumisashi

Undergraduate Student : Nnatsuki Sou, Yuna Miyata

### (2) Main Research Activities

- 1 : Study on candidal biofilms and denture plaque
- 2 : Study on dental caries and probiotics
- 3 : Design for cationic antimicrobial peptides
- 4 : Study on mechanisms of the alveolar bone resorption
- 5 : Development of bone-resorption inhibitors
- 6 : Study on dental implant materials
- 7 : Collaborative research about allergy
- 8 : Study on digital dentistry
- 9 : Collaborative research about aortic aneurysm
- 10 : Development of oral function devices
- 11 : Analysis of food texture

### (3) Research Achievements

#### A) Original Papers (including Case Reports)

- 1 : Occlusal support is associated with nutritional improvement and recovery of physical function in patients recovering from hip fracture: Sawa Y, Kayashita J, Nikawa H.: *Gerodontology*, 37(1),59-65,2020.
- 2 : Developing New Information Sheets for Evacuees and Evacuation Centers to be Used During All Natural Disaster Phases: Kitano H, Kako M, Tsuga K, Nikawa H, Mikami Y, Yamashita H, Mori M, Ohge H: *Prehosp Disaster Med*, 35(6),683-687,2020.

- 3 : Cytotoxicity assay using a human pluripotent stem cell-derived cranial neural crest cell model: Mine Y, Suga M, Mimura S, Minoda M, Murayama T, Nikawa H, Furue MK: *In Vitro Cell Dev Biol Anim*, 56(7),505-510,2020.
- 4 : Simulation and navigation of living donor hepatectomy using a unique three-dimensional printed liver model with soft and transparent parenchyma: Kuroda S, Kihara T, Akita Y, Kobayashi T, Nikawa H, Ohdan H: *Surg Today*, 50(3), 307-313,2020.
- 5: Comprehensive analysis of transcriptional profiling in oral epithelial-like cells stimulated with oral probiotic *Lactobacillus* spp: Endo K, Mine Y, Shuto T, Taji T, Murayama T, Nikawa H: *Archives of Oral Biology*, 118,1-6, 2020.

#### B) Review

#### C) Publications

#### D) Other Publications

#### E) Presentation at Scientific Meeting

#### F) Symposium and special lecture

#### (4) Status of Receiving Grants-in Aid for Scientific Research, etc.

- 1 : Grants-in-Aid for Scientific Research (Scientific Research (C)) :Hiroki Nikawa (Head), Tsuyoshi Taji (Co-investigators), Research Project Number: 20K10053. ¥1,560,000
- 2 : Collaborative Research budget from *Eisai* Co., Ltd. to Hiroki Nikawa. ¥450,000
- 3 : Donation from ROHTO Pharmaceutical Co., Ltd. to Hiroki Nikawa. ¥300,000
- 4 : Donation from Shikoku nyugyousei corporation to Hiroki Nikawa. ¥300,000
- 5 : Donation from Fujicco Co., Ltd. to Hiroki Nikawa. ¥100,000
- 6 : Donation from Hiroshima Red Cross Hospital & Atomic-bomb Survivors Hospital to Hiroki Nikawa. ¥10,000

#### (5) Academic Awards, etc.

#### (6) Patents

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## Central Research Laboratory

### (1) Staff and Students

Director : Chisa Syukunami (by-work)

Assistant Professor : Ikue Hayashi

### (2) Main Research Activities

1 : Proteome analysis and metabolome analysis using mass spectrometry

2 : Structural analysis of biologically active substances

### (3) Research Achievements

#### A) Original Papers (including Case Reports)

1 : FXR1 is a novel MRE11-binding partner and participates in oxidative stress responses : Qi F., Meng Q., Hayashi I., Kobayashi J. : Journal of Radiation Research, 61 (3), 368–375, 2020.

2 : Persistent colonization of non-lymphoid tissue resident macrophages by *Stenotrophomonas maltophilia* : Takahashi I., Hosomi K., Nagatake T., Toubou H., Yamamoto D., Hayashi I., Urashima O., Sato S., Shibata N., Goto Y., Maruyama F., Nakagawa I., Kuwae A., Abe A., Kunisawa J., Kiyono H. : Int Immunol., 32 (2), 133-141, 2020.

3 : Active sites of human MEPE-ASARM regulating bone matrix 1 mineralization: Minamizaki T., Sakurai K., Hayashi I., Toshishige M., Yoshioka H., Kozai K., Yoshiko Y. : Molecular and Cellular Endocrinology, 517, 110931, 2020.

#### B) Review

#### C) Publications

#### D) Other Publications

1 : Molecular epidemiological study on the effect of smoking on metabolome and inflammation-related biomarkers : Hayashi I., Sugimura H. : Smoking Research Foundation Annual Research Report, 882-886, 2020

#### E) Presentations at Scientific Meetings



F) Special lectures in academic meetings

(4) Status of Receiving Grants-in Aid for Scientific Research, etc.

1 : Research project, Grant-in-Aid for Scientific Research (C): Hayashi I: Functional analysis of novel acetyltransferase derived from oral streptococcus and its relation to the regulation of virulence: (No. 20 K10268) 340,000JPY

2 : Smoking Research Foundation: Hayashi I. : Molecular epidemiological study on the effect of smoking on metabolome and inflammation-related biomarkers: 1,500,000JPY.

(5) Academic Awards, etc.

(6) Patents

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## Graduate School of Biomedical and Health Sciences

### (1) Staff and Students

Assistant Professor: KATO Fuminori

### (2) Main Research Activities

- 1 : Toxin-antitoxin systems in *Staphylococcus aureus*
- 2 : Transcriptional regulators for pathogenic genes in *Staphylococcus aureus*
- 3 : Molecular genetic tools in *Staphylococcus aureus*

### (3) Research Achievements

#### A) Original Papers (including Case Reports)

#### B) Review

#### C) Publications

#### D) Other Publications

#### E) Presentations at Scientific Meetings

- 1 : Characterization of novel toxin inhibiting DNA gyrase in *Staphylococcus aureus*: Fuminori Kato, Yoshihiro Yamaguchi, Masayori Inouye : The 93rd Annual Meeting of Japanese Society for Bacteriology (Nagoya), 2020
- 2 : Characterization of bacterial dormancy and awakening via TA system: An integrative approach ranging from biochemistry to single-cell analysis : Fuminori Kato : The 93rd Annual Meeting of the Japanese Biochemical Society, 2020
- 3 : Characterization of TsaAT toxin-antitoxin system in *Staphylococcus aureus*: Fuminori Kato: The 43rd Annual Meeting of the Molecular Biology Society of Japan, 2020

#### F) Special lectures in academic meetings

### (4) Status of Receiving Grants-in Aid for Scientific Research, etc.

- 1 : JSPS Grant-in-Aid For Scientific Research(C) : *Staphylococcus aureus* toxin-antitoxin system regulating bacterial cell death and persister formation: Fuminori Kato, Grant Number JP20K07480, 1,430,000 yen
- 2 : JSPS Grant-in-Aid For the Promotion of Joint International Research (Fostering Joint International Research (A)): Development of novel antibiotics targeting toxin-antitoxin system in *Staphylococcus aureus* : Fuminori Kato, JP19KK0409, 15,210,000 yen

(5) Academic Awards, etc.

(6) Patents

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## Center for Cause of Death Investigation Research & Education

### (1) Staff and Students

Associate Professor/Lecturer: Hiroko Oka (Specially appointed)

### (2) Main Research Activities

- 1 : Causes of death and oral findings
- 2 : Age prediction using oral specimen and findings
- 3 : Personal identification system
- 4 : Education method and assessment on forensic odontology

### (3) Research Achievements

#### A) Original Papers (including Case Reports)

- 1 : Oka H et al. Current status of the forensic dentistry section at the cause of death investigation research and education hub centers. 13(1):8-13, 2020.
- 2 : Kitagawa M, Nagamine K, Oka H, Ouhara K, Ogawa I, Komatsuzawa H, Kurihara H: Rapid detection of the *Streptococcus mutans* *cnm* gene by loop-mediated isothermal amplification. Analytical Biochemistry, Epub 2020.

#### B) Review

#### C) Publications

#### D) Other Publications

- 1 : Tsukinoki K, Segawa H, Nakakuki K, Oka H, Adachi R. : A report of at the 38th Annual Academic Meeting of Japanese Dental Education Association “Symposium 1: What to do on education of "Disaster Dentistry" ! - For promoting the Subject "Disaster Dentistry = to save lives" -.” Journal of Japanese Dental Education Association. 36(3):125-129, 2020.

#### E) Presentations at Scientific Meetings

- 1 : A Study of Asian age prediction method based on DNA methylation DNA – A Comparison of Saliva samples from Japanese and Indonesian people: Hiroko Oka. The 104<sup>th</sup> Congress of Japanese Society of Legal Medicine (Kyoto), 2020.
- 2 : A Survey on the Knowledge of Dental Trainees about Roles of Health Professions under Disasters: Hiroko Oka, Hiromi Nishi, Taiji Ohbayashi, Hiroyuki Kawaguchi. The 39th Annual Academic Meeting of Japanese Dental Education Association (Web), 2020.
- 3 : What and how dental students learned in the undergraduate student life with international students II. Results of qualitative and quantitative studies: Hiroko Oka, Tsuyoshi Taji.: The 39th Annual Academic Meeting of Japanese Dental Education Association (Web), 2020.
- 4 : A report of the activities 2019 at Center for Cause of Death Investigation Research & Education and the section of Forensic Dental Sciences in Hiroshima University: Hiroko Oka, Katsuyuki Kozai, Naoya Kakimoto, Wataru Fukumoto, Daiki Taniyama, Akira Namera, Masataka Nagao, Kazuo Awai, Wataru Yasui. Hiroshima Prefectural Dental Association-Hiroshima University Dental Society Regular Meeting 2020 (Hiroshima), 2020.
- 5 : Study on Development of Age Estimation methods based on Teeth DNA methylation using HRM:-the 2<sup>nd</sup> Report:- Hiroko Oka: The 14th Annual Meeting of Japanese Society of Forensic Dental Science (Morioka), 2020.

(plus other 1 presentation as a co-presenter)

#### F) Special lectures in academic meetings

- 1 : "The role of the dentist on the cause of death investigation"  
Hiroko Oka: Disaster Dental Oral Medicine Symposium (August 2020, Online, Fukuoka)
- 2 : "Forensic Dentistry in Medical and Dental Collaboration "  
Hiroko Oka (A lecture for the e-learning material, Kyushu University)
- 3 : A report from "The 73th MEDC Workshop WS-7:Let's think about medical and dental education for disaster conditions" etc.  
Hiroko Oka: The 39th Annual Academic Meeting of Japanese Dental Education Association, Symposium 1 (Online, Yokohama), 2020.
- 4 : What can I can we do as dentists in disasters  
Hiroko Oka: A Seminar for Dental Trainees at Hiroshima University Hospital (April 2020, Hiroshima)

#### (4) Status of Receiving Grants-in Aid for Scientific Research, etc.

- 1 : Grants-in-Aid for Scientific Research (Scientific Research(C)) : Hiroko Oka, Development of Asian age prediction method based on DNA methylation DNA. No.18K09910
- 2 : Pfizer Health Research Foundation 2020 : Hiroko Oka, A study for personal identification based on the dental metal composition in oral cavity of Asians

(5) Academic Awards, etc.

(6) Patents

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## Division of General Dentistry

### Department of General Dentistry

#### (1) Staff and Students

Professor :Hiroyuki Kawaguchi

Assistant Professor : Hiromi Nishi, Taiji Obayashi, Syuichi Munenaga

Resident : Nami Obayashi

Graduate Student : Noriaki Ide

#### (2) Main Research Activities

1. Research in patient-centered dentistry based on narrative approach
2. Research in general dentistry
3. Examination of postgraduate dental training program
4. Research in health communication strategy
5. Research in clinical education
6. Research in assessment of clinical skills
7. Research in development and standardization of simulated patients
8. Research in taste disorder of patients receiving chemotherapy

#### (3) Research Achievements

##### A) Original Papers (including Case Reports)

1. Mizuno N, Iwata T, Ohsawa R, Ouhara K, Matsuda S, Kajiya M, Matsuda Y, Kume K, Tada Y, Morino H, Yoshimoto T, Ueki Y, Mihara K, Sotomaru Y, Takeda K, Munenaga S, Fujita T, Kawaguchi H, Shiba H, Kawakami H, Kurihara H. Optineurin regulates osteoblastogenesis through STAT1. *Biochem Biophys Res Commun.* 2020 May 14;525(4):889-894. doi: 10.1016/j.bbrc.2020.03.028. Epub 2020 Mar 12. PMID: 32171527.
2. Ikeda-Kaneda E, Iwata T, Mizuno N, Nagahara T, Kajiya M, Takeda K, Hirata R, Ishida S, Yoshioka M, Fujita T, Kawaguchi H, Kurihara H: Periodontal ligament cells regulate osteogenesis via miR-299-5p in mesenchymal stem cells. *Differentiation* 112, 47-57, 2020.
3. Ikeda-Kaneda E, Iwata T, Mizuno N, Nagahara T, Kajiya M, Ouhara K, Yoshioka M, Ishida S, Kawaguchi H, Kurihara H: Regulation of osteogenesis via miR-101-3p in mesenchymal stem cells by human gingival fibroblasts. *J Bone Miner Metab.* 2020 Jul;38(4):442-455. doi: 10.1007/s00774-

- 019-01080-2. Epub 2020 Jan 23.
4. Mizuno N, Kume K, Nagatani Y, Matsuda S, Iwata T, Ouhara K, Kajiya M, Takeda K, Matsuda Y, Tada Y, Ohsawa R, Morino H, Mihara K, Fujita T, Kawaguchi H, Shiba H, Kawakami H, Kurihara H: Aggressive periodontitis and NOD2 variants. *J Hum Genet.* 2020 May 19. Doi: 10.1038/s10038-020-0777-z
  5. Hamamoto Y, Ouhara K, Munenaga S, Shoji M, Ozawa T, Hisatsune J, Kado I, Kajiya M, Matsuda S, Kawai T, Mizuno N, Fujita T, Hirata S, Tanimoto K, Nakayama K, Kishi H, Sugiyama E, Kurihara H. Effect of Porphyromonas gingivalis infection on gut dysbiosis and resultant arthritis exacerbation in mouse model. *Arthritis Res Ther.* 2020 Oct 19;22(1):249. doi: 10.1186/s13075-020-02348-z. PMID: 33076980; PMCID: PMC7574451.
  6. Ozawa T, Ouhara K, Tsuda R, Munenaga S, Kurihara H, Kohno H, Hamana H, Kobayashi E, Taki H, Tobe K, Sugiyama E, Muraguchi A, Kishi H. Physiologic Target, Molecular Evolution, and Pathogenic Functions of a Monoclonal Anti-Citrullinated Protein Antibody Obtained From a Patient With Rheumatoid Arthritis. *Arthritis Rheumatol.* 2020 Dec;72(12):2040-2049. doi: 10.1002/art.41426. Epub 2020 Oct 25. PMID: 32621659.
  7. Nishi H, Hosomi N, Ohta K, Aoki S, Nakamori M, Nezu T, Shigeishi H, Shintani T, Obayashi T, Ishikawa K, Kinoshita N, Shiga Y, Sugiyama M, Ohge H, Maruyama H, Kawaguchi H, Kurihara H. Serum immunoglobulin G antibody titer to Fusobacterium nucleatum is associated with unfavorable outcome after stroke. *Clin Exp Immunol.* 2020 Jun;200(3):302-309. doi: 10.1111/cei.13430. Epub 2020 Mar 24. PMID: 32155293; PMCID: PMC7232001.
  8. Tokui A, Yano K, Nakaoka M, Nishi H.. Oral care was effective in a patient with refractory stomatitis after living kidney transplantation.. *The Journal of dental health.* 2020 Feb.p.1-6 *JSDH Vol.15 No.1,*
  9. Aoki S, Hosomi N, Nishi H, Nakamori M, Nezu T, Shiga Y, Kinoshita N, Ueno H, Ishikawa K, Imamura E, Shintani T, Ohge H, Kawaguchi H, Kurihara H, Maruyama H. Serum IgG titers to periodontal pathogens predict 3-month outcome in ischemic stroke patients. *PLoS One.* 2020 Aug 6;15(8):e0237185. doi: 10.1371/journal.pone.0237185. PMID: 32760103; PMCID: PMC7410289.
  10. Shiga Y, Hosomi N, Nezu T, Nishi H, Aoki S, Nakamori M, Ishikawa K, Kinoshita N, Imamura E, Ueno H, Shintani T, Ohge H, Kawaguchi H, Kurihara H, Wakabayashi S, Maruyama H. Association between periodontal disease due to Campylobacter rectus and cerebral microbleeds in acute stroke patients. *PLoS One.* 2020 Oct 8;15(10):e0239773. doi: 10.1371/journal.pone.0239773. PMID: 33031428; PMCID: PMC7544022.
  11. Nishi H, Takahashi S, Ohta K, Takamoto M, Shigeishi H, Go S, Obayashi T, Yoshioka Y, Konishi M, Shimizu Y, Yano K, Miyagawa T, Kakimoto N, Ohge H, Kawaguchi H, Kurihara H. Effects of perioperative oral care on postoperative inflammation following heart valve surgery. *Oral Dis.* 2020 Oct 17. doi: 10.1111/odi.13682. Epub ahead of print. PMID: 33067895.
  12. Nakamori M, Hosomi N, Nishi H, Aoki S, Nezu T, Shiga Y, Kinoshita N, Ishikawa K, Imamura E,



- Shintani T, Ohge H, Kawaguchi H, Kurihara H, Wakabayashi S, Maruyama H. Serum IgG titers against periodontal pathogens are associated with cerebral hemorrhage growth and 3-month outcome. *PLoS One*. 2020 Oct 28;15(10):e0241205. doi: 10.1371/journal.pone.0241205. PMID: 33112888; PMCID: PMC7592768.
13. Naruse T, Ohta K, Kato H, Ishida Y, Shigeishi H, Sakuma M, Fukui A, Nakagawa T, Tobiume K, Nishi H, Takechi M. Immune response to cytosolic DNA via intercellular receptor modulation in oral keratinocytes and fibroblasts. *Oral Dis*. 2020 Nov 17. doi: 10.1111/odi.13725. Epub ahead of print. PMID: 33200485.
  14. Ishikawa M, Shigeishi H, Nishi H, Sugiyama M, Ohta K Analysis of the factors associated with severity of oral mucositis in patients who received allogenic hematopoietic stem cell transplantation. *The Journal of Dental Society of Hiroshima University* 2020 Dec. (52)2:62-68.

## B) Review

## C) Publications

1. Kawaguchi H, Kurihara H: Cell Therapy. In: Murakami S, Shin K, Saitoh A, Yamada S, eds, *Clinical Periodontology* 3<sup>rd</sup> ed, Ishiyaku Publishing, Tokyo, P240-244, 2020

## D) Other Publications

1. Kawaguchi H (Contribution writing): JSP Guidelines for the Use of Antimicrobial Agents in Patients with Periodontal Diseases 2020. The Japanese Society of Periodontology ed, 2020.
2. Kawaguchi H (Co-translation) : 2017 World Workshop on the Classification of Periodontal and Peri-Implant Disease and Conditions. Kornman KS, Tonetti MS, eds, Quintessence Publishing, Tokyo, 156-171, 2020

## E) Presentations at Scientific Meetings

1. ○Obayashi T, Nishi H, Munenaga S, Shiba H, Kozai K, Kawaguchi H. Task Analysis of Hiroshima University Hospital dental trainees in remote work : The 104th Dental Society of Hiroshima University (Hiroshima), 2020/11
2. ○Kawagoe M, Kawaguchi H, Nakaoka M, Obayashi T, Oka H, Abe Y, Okada Y, Shiba H. Action on Disaster Countermeasures in Dental Departments of Hiroshima University Hospital : The 104th Dental Society of Hiroshima University (Hiroshima), 2020/11

3. ○Oka H, Nishi H, Obayashi T, Kawaguchi H. A Survey on the Knowledge of Dental Trainees about Roles of Health Professions under Disasters : The 39th Meeting of Japanese Dental Education Association (Online), 2020/9/25~10/24
4. ○Katsura K, Soga Y, Nishi H, Soga M, Usubuchi K, Mitsunaga Y, Tomizuka K, Konishi T, Hatchioka W, Ueno H, Aragaki S, Hayashi T. A cost-minimization analysis of measures against metallic dental restoration in head and neck radiotherapy. The 6th Annual Meeting of Japanese Association of Oral Supportive Care in Cancer (JAOSCC) (kanagawa), 2020/12
5. ○Nishi H, Obayashi T, Oshimo S, Kurihara H, Shime N, Kawaguchi H. Specific oral bacteria associated with respiratory diseases requiring intensive care. The 42nd Annual Meeting, Japanese Society of Respiratory Care Medicine(Kyoto), 2020/12.

#### F) Implementation of Seminars / Workshops

1. Kawaguchi H: The 24<sup>th</sup> Seminar of Instructor of Dentist Clinical Training at Chugoku-Sikoku regions, 2020/2/1,2
2. Kawaguchi H: The 1<sup>st</sup> Seminar of Instructor of Dentist Clinical Training at Kanazaki Dental Clinic, 2020/2/22,23
3. Kawaguchi H: Post-CC-CSX evaluator training workshop. sponsored by KATO, 2020/12/19
4. Kawaguchi H: Post-CC-CPX evaluator training workshop. sponsored by KATO, 2020/12/19

#### G) Lecturer • Symposium

1. Lecture: Nishi H: Regional alliances. Hiroshima Dental Association Training Seminar (Hiroshima), 2020/2/16

#### H) Attending of Lectures, Seminars, and Workshops

1. Kawaguchi H: Post-CC-CSX manager and Examiner training workshop. sponsored by KATO (Tokyo), 2020/1/14

#### I) Implementation of OSCE, CSA

#### (4) Status of Receiving Grants-in Aid for Scientific Research, etc.

1. Munenaga S (Research representative). Grant-in-Aid Scientific Research. 4,100,000Yen. 19K18999  
「Elucidation of the rheumatoid arthritis mechanism via periodontal tissue-induced HuR and exosomes」

2. Nishi H (Research representative). Grant-in-Aid Scientific Research. 4,420,000Yen.20K10162  
「Development of a system to prevent systemic complications in cancer chemotherapy by targeting oral bacteria」
3. Kawaguchi H (Research representative), Nishi H (Research Contributors), Grant-in-Aid Scientific Research. 4,030,000Yen. 18K09880  
「Utility of the perioperative oral management by the probiotics」

#### (5) Academic Awards, etc.

1. Nishi H : Excellent performance award. Specific oral bacteria associated with respiratory diseases requiring intensive care. The 42nd Annual Meeting, Japanese Society of Respiratory Care Medicine, 2020/12, kyoto.

#### (6) Patents

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## **Division of Oral Health and Development**

### **Department of Oral Health**

#### (1) Staff and Students

Professor: Kouji Oota, Toshinobu Takemoto, Mariko Naito, Hiroki Nikawa, Masato Kaku

(\*) Chief: Kouji Oota (by-work)

Associate Professor: Tsuyoshi Taji

Associate Professor/Lecturer: Hisako Sasahara, Hideo Shigeishi, Atsue Matsumoto

Assistant Professor: Yoshie Niitani, Rumi Nishimura, Tomoko Maehara

Education and Research Support Staff: Minako Ogawa, Naomi Nakashima, Sanae Miyoshi,  
Yuko Kurawaki, Reiko Aimi, Hitomi Ito

Please refer to the research achievements of the following each department.

- Department of Public Oral Health: Kouji Oota, Hideo Shigeishi, Tomoko Maehara,
- Department of Oral Epidemiology: Mariko Naito, Rumi Nishimura
- Department of Oral Health Management: Toshinobu Takemoto, Atsue Matsumoto, Yoshie Niitani
- Department of Anatomy and Functional Restorations: Masato Kaku
- Department of Oral Biology & Engineering: Hiroki Nikawa, Tsuyoshi Taji, Hisako Sasahara

#### (2) Main Research Activities

- 1 : Study on oral function in the elderly
- 2 : Study on Job Return Support Program

#### (3) Achievements

##### A) Original Papers (including Case Reports)

1 : Relationship between oral and physical function and length of participation in long-term care prevention programs in community-dwelling older Japanese women. : Miyoshi S, Saito A, Shigeishi H, Ohta K, Sugiyama M. : Eur Geriatr Med, Nov 3, 2020.

##### B) Review

##### C) Publications

## D) Other Publications

### E) Presentations at Scientific Meetings

1 : A Study on the Effectiveness of Training to Prevent Turnover of Dental Hygienists : Kurawaki Y, Aimi R, Nishimura R, Matsumoto A, Takemoto T, Naito M : The 61<sup>st</sup> General Meeting of Japanese Society of Dental Practice Administration, 2020.

2 : Effects of participation in community-based health exercise programs on oral and physical functions of community-dwelling elderly people. : Miyoshi S, Saito A, Shigeishi H, Ohta K, Sugiyama M. : The 69th General Meeting of Japanese Society for Oral Health,2020.

3 : Training on prevention of periodontal diseases at the Center for Dental Hygienists' Education and Training, Hiroshima University. : Aimi R, Kurawaki Y, Matsumoto A, Nishimura R, Naito M, Takemoto T : The 15th Annual Meeting of the Japan Society for Dental Hygiene, 2020.

: Overview of the Center for Dental Hygienists' Education and Training in the Project to Support the Return to Work of Dental Hygienists. : Kurawaki Y, Aimi R, Matsumoto A, Nishimura R, Naito M , Takemoto T. : The 15th Annual Meeting of the Japan Society for Dental Hygiene, 2020.

5 : Relationship between dietary diversity and oral function among community-dwelling elderly participating in community-based health exercise programs. : Miyoshi S, Saito A, Shigeishi H, Ohta K, Sugiyama M. : The 15th Annual Meeting of the Japan Society for Dental Hygiene, 2020.

6 : Relationship between oral and physical function and length of participation in long-term care prevention programs in community-dwelling older people. : Saito A, Miyoshi , Yamane T, Miyamoto Y, Shigeishi H, Ohta K, Sugiyama M. : The 15th Annual Meeting of the Japan Society for Dental Hygiene, 2020.

7 : Survey of participants in the Project to Support the Return to Work of Dental Hygienists. : Tsuruda K, Kurawaki Y, Aimi R, Misumi K, Tetsumori K, Daijyo A, Nishimura R, Matsumoto A, Naito M , Takemoto T. : The 31<sup>st</sup> general meeting of Kinki, Chugoku, Shikoku Society for Oral Health,2020.

8 : Efforts of the Center for Dental Hygienists' Education and Training, Hiroshima University in the Project to Support the Return to Work of Dental Hygienists. : Nishimura R, Kurawaki Y, Aimi R, Tsuruda K, Misumi K, Tetsumori K, Daijyo A, Nishimura R, Matsumoto A, Naito M, Takemoto T. : The general meeting of Chugoku Society for Dental Practice Administration,2020.

### F) Lectures

#### (4) Status of Receiving Grants-in Aid for Scientific Research, etc.

1: Japan Dental Hygienists' Association, Clinical Research Grant for Dental Hygiene: S. Miyoshi, Relationship between dietary diversity and oral function among older people participating in community-

based health exercise programs. 300,000 yen

(5) Academic Awards, etc.

(6) Patents

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## Division of Oral Health and Development Department of Special Care Dentistry

### (1) Staff and Students

Professor	: Yoshiyuki Okada (* ) Chief: Yoshiyuki Okada
Associate Professor/Lecturer	: Yuki Oda (lecturer in Hospital)
Assistant professor	: Yuriko Yoshida (September~)
Medical Doctor	: Chiaki Furutani, Shinsuke Takashima
Clinical Staff	: Kota Miyahara, Hironori Miyazaki
Research Student	: Chiaki Furutani( ~ March), Kota Miyahara, Hironori Miyazaki, Shinsuke Takashima, Momo Adachi
Clinical Trainee	: Fumiko Hayashi, Masaki Hayashiuchi,

### (2) Main Research Activities

- 1: Evaluation of the circulatory systems in patients with cardiovascular and congenital heart diseases.
- 2: Effects of vasoconstrictor in local anesthesia on baroreflex sensitivity.
- 3: Relationship between central artery stiffness and periodontal diseases, and the influence on baroreflex sensitivity.
- 4: Influences of sleep bruxism in hypoxia on the central cardiovascular control system.
- 5: Underlying mechanisms of suppressed pressor responses to pain stimulation by N2O.
- 6: Alterations of pulse wave reflection by sedative agents.
- 7: A study on risk of dental caries and periodontal disease in patients with disabled
- 8: A study about the influence of L. Rhamnosus on caries and periodontal risk with disabled patients
- 9: A study on the frequency of bruxism and clenching during sleep in patients with cerebral palsy
- 10: A study on relationship between autism spectrum disorder and oral-intestinal flora
- 11: Effect of different administration route of midazolam on sedation in patients with intellectual disabilities
- 12: Evaluation of anxiety and stress caused by the spread of Covid-19 infection in people involved in Special Care Dentistry

### (3) Research Achievements

#### A) Original Papers (including Case Reports)

- 1 : Broader adaptive range of sympathetic burst size in response to blood pressure change in older women with greater arterial stiffness. Yoshiyuki Okada, M Melyn Galbreath, Sara S Jarvis, Shigeki Shibata, Wanpen Vongpatanasin, Benjamin D Levine, Qi Fu: *J Physiol*, 598(6): pp. 3331-3341, 2020
- 2 : Sex Differences in the Sympathetic Neural Recruitment and Hemodynamic Response to Head-Up Tilt in Older Hypertensives. Mark B Badrov, Yoshiyuki Okada, Jeung-Ki Yoo, Wanpen Vongpatanasin, J Kevin Shoemaker, Benjamin D Levine, Qi Fu: *Hypertension*, 75(2): pp. 458-467, 2020
- 3 : Pharyngeal Deposits Comprising Salivary Mucin in Tube-fed Elderly Patients: MUC2 and MUC7 Immunoreactivity. Kohta Miyahara, Tadashi Ogasawara, Hiromasa Hasegawa, Kohichi Shinotsuka, Katsumitsu Shimada, Takanaga Ochiai, Fa-Chih Shen, Yasuaki Kakinoki: *Dysphagia*, Online ahead of print, 2020.
- 4 : Cell-free mitochondrial DNA increases in maternal circulation during healthy pregnancy: a prospective, longitudinal study. Spencer C Cushen, Marc L Sprouse, Alexandra Blessing, Jie Sun, Sara S Jarvis, Yoshiyuki Okada, Qi Fu, Steven A Romero, Nicole R Phillips, Styliani Goulopoulou: *Am J Physiol. Regul, Integr Comp Physiol*, 318(2): pp. R445-R452, 2020
- 5 : A clinico-statistical study of food consumption by patients with intellectual disabilities following the third molar extraction under general anesthesia : Yuki Oda, Keita Yoshida, Chiaki Furitani, Aya Oda, Tomohiro Mukai, Masahire Irifune, Yoshiyuki Okada: *JJSDH* 41 (1): pp. 35-41, 2020
- 6 : A Case of difficult ventilation during the induction of general anesthesia because of bronchospasm: Taiga Yoshinaka, Akari Mukai, Tamayo Takahashi, Yuya Ogawa, Takahiro Kochi, Yuki Oda, Kana Oue, Mituru Doi, Yoshitaka Shimizu, Mitsuhiro Yoshida, Masahiro Irifune: *J Jap Dent Soc Anesth*, 48( 2): pp. 81-83 2020
- 7 : Research on Current Status and Clinico-Statistical Analysis of Intravenous Sedation at Special Care Dental Clinic of Hiroshima University Hospital : Yuki Oda, Chiaki Furutani, Kota Miyahara, Hironori Miyazaki, Aya Oda, Tomohiro Mukai, Taiga Yoshinaka, Eiji Imado, Kana Oue, Tamayo Takahashi, Tomoko Tokikazu, Yuika Mizota, Mayuko Watari, Akari Mukai, Masahiro Irifune, Yoshiyuki Okada: *J Hiroshima Univ Den Soc*, 52(1): pp.1-6, 2020
- 8 : A case of a Severely Mentally and Physically Disordered Child with Non-drug and Non-hereditary Gingival Hyperplasia. Nina Wakimoto, Tadashi Ogasawara, Shinichiro Uematsu, Tamaki Katsumata, Sayoko Suzuki, Souichiro Kawase, Nobuo Yoshinari, and Yoshiyuki Okada: *JJSDH*, 41 : pp. 340-346, 2020
- 9 : Oral Conditions Associated with Fever Risk in Elderly People Requiring Nursing Care with Tube Feeding : Hironao Asahina, Tadashi Ogasawara, Toshie Akieda, Kota Miyahara, Kohei Mmtsumura, Mai Shoji, Shigeru Shimada, Saya Shimada, Yasuaki Kakinoki : *JJSDH*, 41 : pp. 375-381, 2020
- 10 : A Bacterial Flora Analysis of the Tongue and Pharynx in Patients with Tube Feeding by Next-



generation Sequencing : Toshie Akieda, Tadashi Ogasawara, Hironao Asahina, Kota Miyahara, Kohei Mmtsumura, Mai Shoji, Shigeru Shimada, Saya Shimada, Makoto Taniguchi, Akihiro Yoshida : *JJSDH*, 41 : pp.287-298, 2020

## B) Review

## C) Publications

- 1 : 有病者歯科学 2<sup>nd</sup> Edition: Yoshiyuki Okada (coauthored): Nagasue-syoten (Kyoto), p76-79, 2018.

## D) Other Publications

## E) Presentations at Scientific Meetings

- 1 : Non-invasive estimation of muscle sympathetic nerve activity using finger vascular stiffness. Toshiki Sakashita, Furui Akira, Harutoyo Hirano, Shun Akiyoshi, Takahumi Sasaoka, Zu Soh, Yoshiyuki Okada, Atsuo Yoshino, Ryuji Nakamura, Noboru Saeki, Masao Yoshizumi, Masashi Kawamoto, Shigeto Yamawaki, Toshio Tuji : IEICE General Conference 2020 (Hiroshima), 2020
- 2 : Relationship between changes in baroreflex sensitivity and blood pressure during intravenous sedation with propofol : Hironori Miyazaki, Sachi Sumida, Chiaki Furutani, Kota Miyahara, Yuki Oda, Yoshiyuki Okada : The 29<sup>th</sup> Annual Meeting of Japanese Society of Dentistry for Medically Compromised Patients (Kobe), 2020.
- 3 : A Case of Dental Treatment Under General Anesthesia for Patients with Lissencephaly with Dysphagia : Kota Miyahara, Hironori Miyazaki, Chiaki Furutani, Yuki Oda, Yoshiyuki Okada : The 29<sup>th</sup> Congress of Japanese Society of Dentistry for Medically Compromised Patient (Kobe), 2020.
- 4 : Comparison of the relative abundance of periodontal pathogens in oral flora between healthy individuals and individuals with difficulties in oral-self-care: Yuki Oda, Chiaki Furutani, Kota Miyahara, Hironori Miyazaki, Tsuyoshi Taji, Yoshiyuki Okada, Hiroki Nikawa: The 31<sup>th</sup> Congress of Japanese Society of Gerodontology (Yokohama), 2019.
- 5 : Effects of central command induced by stress experiences on hemodynamic responses : Hironori Miyazaki, Kota Miyahara, Tomoko Tokikazu, Haruka Yasuda, Chiaki Furutani, Mayuko Watari, Shinsuke Takashima, Yuki Oda, Yoshiyuki Okada : The 37<sup>th</sup> Japanese Society for Disability and Oral Health (Yokosuka), 2020.
- 6 : Changes in the age demographic of dental patients with special needs during the last decade : Chiaki Furutani, Hironori Miyazaki, Kota Miyahara, Tomoko Tokikazu, Atsuko Wakita, Yui Mizota, Sinsuke Takashima, Masaki Hayashiuchi, Yuki Oda, Yoshiyuki Okada : The 37<sup>th</sup> Japanese Society for Disability and Oral Health (Yokosuka), 2020.
- 7 : Age related changes in the frequency of dental prosthesis in disabled patients : Wakabayashi Y., Oda Y., Yasuda H., Furutani C., Miyahara K., Miyazaki H., Takashima S., Nakaoka M., Okada Y. : The 37<sup>th</sup> Japanese Society for Disability and Oral Health (Yokosuka), 2020.
- 8 : Examination of factors affecting the availability of dentures in disabled patients : Yasuda H, Oda Y, Wakabayashi Y, Furutani C, Miyahara K, Miyazaki H, Takashima S, Nakaoka M, Okada Y : The

37th Japanese Society for Disability and Oral Health (Yokosuka), 2020.

- 9 : A case of dental treatment for patients with tuberous sclerosis taking everolimus : Kota Miyahara, Chiaki Furutani, Hironori Miyazaki, Yuki Oda, Yoshiyuki Okada : The 37th Japanese Society for Disability and Oral Health (Yokosuka), 2020.
- 10 : A case report of cerebral palsy patient whose overdenture with magnet attachment succeeded to stabilize the denture and reduce the burden on the remaining teeth; A case report : Yuki Oda, Chiaki Furutani, Kota Miyahara, Hironori Miyazaki, Shinsuke Takashima, Atsuko Wakita, Yuka Wakabayashi, Syuji Suda, Taku Kanda, Tomohiro Mukai, Aya Oda, Keita Yoshida, Fumiko Hayashi, Masahiro Irifune, Yoshiyuki Okada : The 37th Japanese Society for Disability and Oral Health (Yokosuka), 2020.
- 11 : A case of quantitative analysis of sleep bruxism using a temporal muscle electromyogram device (GrindCare®) in a patient with cerebral palsy.:Kana Oue, Yuki Oda, Chiaki Furutani, Tamayo Takahashi, Taiga Yoshinaka, Akari Mukai, eiji Imado, Tomohiro Mukai, Aya Oda, Tomoka Kikuchi, Takahiro Kochi, Mitsuhiko Yoshida, Yoshiyuki Okada, Masahiro Irifune: The 37th Japanese Society for Disability and Oral Health (Yokosuka), 2020.
- 12 : Preventive effect of oral care on the formation of epithelium membranaous substances : Hironao Asahina, Toshie Akieda, Kota Miyahara, Kohei Mathumura, Tadashi Ogasawara : The 37th Japanese Society for Disability and Oral Health (Yokosuka), 2020.
- 13 : A Bacterial Flora Analysis of the membranaous substances in Patients with Tube Feeding by Next-generation Sequencing. Second report. Factor search for bacterial flora : Hironao Asahina, Toshie Akieda, Kota Miyahara, Kohei Mathumura, Yoshiyuki Okada, Tadashi Ogasawara : The 31th Congress of Japanese Society of Gerodontology (Yokohama), 2020.

#### F) Special lectures in academic meetings

- 1 : Yuki Oda : Possibility of probiotics in Special Care Dentistry: The 37<sup>th</sup> Annual Meeting of Japanese Society for Disability and Oral Health, Symposium 4 ( Yokosuka, Japan) 2020
- 2 : Yoshiyuki Okada : Basic knowledge and dental treatment of children with disabilities: What to do in various situations: Hiroshima Prefecture Comprehensive Project for Securing Community Medical Care, Consultation Doctor Training Workshop, Hiroshima Prefecture Oral Health Liaison Council, Hiroshima, 2020
- 3 : Yoshiyuki Okada : Fluoride Application in Schools for Special Needs Students: Board of Education in Hiroshima, 2020

#### (4) Status of Receiving Grants-in Aid for Scientific Research, etc.

1. Grants-in-Aid for scientific research (B): Yoshiyuki Okada (CI, Continuanace), Proposal of a non-invasive estimation method for human peripheral sympathetic nerve activity and challenge to establish a measurement method of pain sensation. 19H04442. 17,420,000yen.
2. Grants-in-Aid for scientific research (C): Yoshiyuki Okada (PI, Continuanace), Underlying mechanisms and predictive factors for reduction in blood pressure during intravenous sedation with propofol in patients with arteriosclerosis. 18K09927. 4,420,000yen.
3. Grants-in-Aid for scientific research (C) (New): Yoshiyuki Okada (CI, Continuanace), Analysis of

oral bacterial flora and membranous substances on the palates by using Next Generation Sequencing in bedridden elderly people with tube feeding. 18K09897. 4,290,000yen.

4. Grants-in-Aid for young scientists : Yuki Oda (PI, Continuance), Research of the effect of bovine milk fermented with Lactobacillus rhamnosus L8020 on periodontal disease in intellectually disabled patients. 18K17285. 4,290,000 yen.
5. General foundation Ryokufukai. The year of 2020 Grant for young researcher: Hironori Miyazaki (PI, New). Effect of central command induced by stress experience on hemodynamics and its modification by nitrous oxide sedation. 200.000yen.

#### (5) Academic Awards, etc.

1. Hironori Miyazaki: 2020 Education and research prize for encouragement for young researcher, General foundation Ryokufukai (Hiroshima), 2020.

#### (6) Patents

Japan Patent Application: Tokugan 2020-027888: Toshio Tsuji, Bin Furui, Tomo Soga, Toshiki Sakakawa, Takashi Sasaoka, Adults Yamawaki, Masao Yoshisu, Ryo Saeki, Takaharu Nakamura, Yoshiyuki Okada on February 21, 2020

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- **Central Clinical Divisions**
- **Special Dental Clinic Section**

(1) Staff and Students

Chief Professor : Kotaro Tanimoto

Research Associate : Sachiko Yamada

Research Associate : Yukimi Yasuhara

(2) Main Research Activities

- 1 : Research for improvement in articulation problem
- 2 : Research for relation between lingual pressure and the function of speech/swallowing
- 3 : Research for speech and swallowing rehabilitation of oral cancer

(3) Research Achievements

A) Original Papers (including Case Reports)

- 1 : Lip support prosthesis for the patients after resection of oral floor cancer : Yoshikawa M., Yoshida M., Yamada S., Nagasaki T., Nobumoto T., Hamana T., Ishida F., Tanimoto K., Naito M., Kohada A., Tsunoda T., Ishida E., Tsuga K.: J. Hiroshima Univ. Dent. Soc., 52(2), 90-93, 2020.

B) Review

C) Publications

D) Other Publications

E) Presentation at Scientific Meeting

- 1 : Effectiveness of Denture assistance for lip support on post operative oral floor cancer patients : Yamada S., Yoshida M. , Yoshikawa M., Kohada A., Tsunoda T., Ishida E., Nagasaki T., Tsuga K.: Reiwa 2nd Japan Prosthodontic Society Chugoku&Shikoku Branch (Higashihiroshima), 2020.
- 2 : Advanced stage tongue cancer patient with PEG and radiation treatment followed by rehabilitation leads to sustained oral food intake: a case report. Yamada S., Yoshikawa M., Yoshida M., Nagasaki T., Kanda T., Takahashi H., Fujishiro A., Kakimoto N., Tanimoto K.: The 59th Hiroshima prefectural dental association The 104th The Hiroshima University Dental Society (Hiroshima), 2020.
- 3 : Outcome of remained swallowing disorder due to an odontogenic infection-related neck abscess: a case report.: Nagasaki T., Yoshikawa M., Kawagoe M., Yamada S., Yoshikawa M., Ohtsuka M., Konishi M., Verdonschot R., Suei Y., Nakamoto T., Kakimoto N.: The 1st Autumn Meeting of the Japanese Society for Oral and Maxillofacial Radiology (Nagano), 2020.

F) Special lectures in academic meetings

- 1 : Yasuhara Y. : Speech Therapist's work : Takamizu Highschool (Iwakuni), 2020.
- 2 : Yasuhara Y. : Assessment and actuality of Dysphagia Rehabilitation, Hiroshima pref. community-

- based health care and nursing mutual security project : Workshop of the swallowing functional training (Hiroshima), 2020.
- 3 : Yasuhara Y. : Assessment and actuality of Dysphagia Rehabilitation, Hiroshima pref. community-based health care and nursing mutual security project : Workshop of the swallowing functional training (Kure), 2020.
  - 4 : Yasuhara Y. : Assessment and actuality of Dysphagia Rehabilitation, Hiroshima pref. community-based health care and nursing mutual security project : Workshop of the swallowing functional training (Fukuyama), 2020.
  - 5 : Yasuhara Y. : Speech Therapist's work : Setouchi Highschool (Hiroshima), 2020.

#### (4) Status of Receiving Grants-in Aid for Scientific Research

#### (5) Academic Awards

#### (6) Patents

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## Central Clinical Divisions

### Center of Oral Clinical Examination

#### (1) Staff and Students

Director: Hideki Shiba

Associate Professor: Ikuko Ogawa (Clinic, Until March)

Lecturer: Masae Kitagawa (Clinic), Tomoaki Shintani (From August)

Research Associate: Tomoaki Shintani (Until July), Toshinori Ando (From October)

Dentist: Sakamoto Shinnichi, Toshinori Ando (Until September)

Technician: Rie Miyata

#### (2) Main Research Activities

- 1 : Diagnostic pathological study on head and neck lesions.
- 2 : Study on test and treatment of metal allergy and dry mouth.
- 3 : Molecular pathological study on development and progression of oral squamous cell carcinoma.
- 4 : Study on molecular target therapy to oral cancer targeted with HBp17/FGFBP.
- 5 : Analysis of actual condition of oral bacterial infection.
- 6 : Molecular pathological research on oral/head and neck cancer focusing on genomic alterations and the Hippo pathway.

#### (3) Research Achievements

##### A) Original Papers (including Case Reports)

- 1 : Rapid detection of the *Streptococcus mutans* *cnm* gene by loop-mediated isothermal amplification : Kitagawa M, Nagamine K, Oka H, Ouhara K, Ogawa I, Komatsuzawa H, Kurihara H.: *Anal Biochem.*, 605, 113812, 2020.
- 2 : *Porphyromonas gingivalis*, a cause of preterm birth in mice, induces an inflammatory response in human amnion mesenchymal cells but not epithelial cells : Konishi H, Urabe S, Teraoka Y, Morishita Y, Koh I, Sugimoto J, Sakamoto S, Miyoshi H, Miyauchi M, Takata T, Kajioaka S, Kudo Y. : *Placenta*, 99, 21-26, 2020.
- 3 : Odontogenic infection by *Porphyromonas gingivalis* exacerbates fibrosis in NASH via hepatic stellate cell activation : Nagasaki A, Sakamoto S, Chea C, Ishida E, Furusho H, Fujii M, Takata T, Miyauchi M.: *Sci Rep.*, 10(1):4134, 2020.

- 4 : Pathway-specific genome editing of PI3K/mTOR tumor suppressor genes reveals that PTEN loss contributes to cetuximab resistance in head and neck cancer: Izumi H, Wang Z, Goto Y, Ando T, Wu X, Zhang X, Li H, Johnson DE, Grandis JR, Gutkind JS.: *Mol Cancer Ther.*, 19(7), 1562-1571, 2020.
- 5 : Muscarinic receptors promote castration-resistant growth of prostate cancer through a FAK-YAP signaling axis: Goto Y, Ando T, Izumi H, Feng X, Arang N, Gilardi M, Wang Z, Ando K, Gutkind JS.: *Oncogene*, 39(20), 4014-4027, 2020.
- 6 : Clinical Outcomes of Post-exposure Prophylaxis following Occupational Exposure to Human Immunodeficiency Virus at Dental Departments of Hiroshima University Hospital : Shintani T, Iwata T, Okada M, Nakaoka M, Yamasaki N, Fujii T, Shiba H.: *Curr HIV Res.*, 18 (6), 475-479, 2020.
- 7 : Eldecalcitol (ED-71)-induced exosomal miR-6887-5p suppresses squamous cell carcinoma cell growth by targeting heparin-binding protein 17/fibroblast growth factor-binding protein-1 (HBp17/FGFBP-1) : Higaki M, Shintani T, Hamada A, Rosli SNZ, Okamoto T.: *In Vitro Cell Dev Biol Anim.*, 56 (3), 222-233, 2020.
- 8 : Serum immunoglobulin G antibody titer to *Fusobacterium nucleatum* is associated with unfavorable outcome after stroke: Nishi H, Hosomi N, Ohta K, Aoki S, Nakamori M, Nezu T, Shigeishi H, Shintani T, Obayashi T, Ishikawa K, Kinoshita N, Shiga Y, Sugiyama M, Ohge H, Maruyama H, Kawaguchi H, Kurihara H.: *Clin Exp Immunol.*, 200 (3), 302-309, 2020.
- 9 : Histopathological evaluation of minor salivary gland papillary-cystic tumours: focus on genetic alterations in sialadenoma papilliferum and intraductal papillary mucinous neoplasm: Nakaguro M, Urano M, Ogawa I, Hirai H, Yamamoto Y, Yamaguchi H, Tanigawa M, Matsubayashi J, Hirano H, Shibahara J, Tada Y, Tsuzuki T, Okada Y, Sato Y, Ikeda K, Sukeda A, Honda Y, Mikami Y, Nagao T.: *Histopathol.*, 76(3):411-422, 2020.
- 10 : Development of Kikuchi-Fujimoto disease after a cervical lymph node metastasis of mucoepidermoid carcinoma: a case report.: Higaki M, Kanda T, Ando T, Tani R, Toratani S.: *Oral and Maxillofac Surg.*, in press.
- 11 : Identification of a safe and highly specific titanium reagent for patch tests: results from a preliminary clinical trial: Kitagawa M, Iwamoto K, Oka H, Tanaka M, Takechi M, Kurihara H, Hide M, Shiba H. *日口検誌*, in press.
- 12 : The effect of transforming growth factor- $\beta$ 1 on the mineralization of human cementoblasts: Koba T, Watanabe K, Goda S, Kitagawa M, Mutoh N, Hamada N, Tani-Ishii N. *J Endod.*, in press.
- 13 : Allergic Reaction to Zirconia Ceramic Bridge Cementation Using a Dental Adhesive Resin Cement: a Case Report. : Yamashiro Y, Miki H, Kitagawa M, Oka H, Arias Z, Takashiba S. *SN Compr Clin Med.*, in press.
- 14 : Identification of regulatory mRNA and microRNA for differentiation into cementoblasts and periodontal ligament cells: Iwata T, Mizuno N, Nagahara T, Kaneda-Ikeda E, Kajiya M, Kitagawa M, Takeda K, Yoshioka M, Yagi R, Takata T, Kurihara H. *J Periodontal Res.*, in press.

- 15: Serum IgG titers against periodontal pathogens are associated with cerebral hemorrhage growth and 3-month outcome: Nakamori M, Hosomi N, Nishi H, Aoki S, Nezu T, Shiga Y, Kinoshita N, Ishikawa K, Imamura E, Shintani T, Ohge H, Kawaguchi H, Kurihara H, Wakabayashi S, Maruyama H.: PLoS One, in press.
- 16 : Association between periodontal disease due to *Campylobacter rectus* and cerebral microbleeds in acute stroke patients: Shiga Y, Hosomi N, Nezu T, Nishi H, Aoki S, Nakamori M, Ishikawa K, Kinoshita N, Imamura E, Ueno H, Shintani T, Ohge H, Kawaguchi H, Kurihara H, Wakabayashi S, Maruyama H.: PLoS One, in press.
- 17 : Serum IgG titers to periodontal pathogens predict 3-month outcome in ischemic stroke patients: Aoki S, Hosomi N, Nishi H, Nakamori M, Nezu T, Shiga Y, Kinoshita N, Ueno H, Ishikawa K, Imamura E, Shintani T, Ohge H, Kawaguchi H, Kurihara H, Maruyama H.: PLoS One, in press.
- 18: Homeobox transcription factor engrailed homeobox 1 is a possible diagnostic marker for adenoid cystic carcinoma and polymorphous adenocarcinoma: Baba S, Akashi T, Kayamori K, Ohuchi T, Ogawa I, Kubota N, Nakano K, Nagatsuka H, Hasegawa H, Matsuzaka K, Tomii S, Uchida K, Katsuta N, Sekiya T, Ando N, Miura K, Ishibashi H, Ariizumi Y, Asakage T, Michi Y, Harada H, Sakamoto K, Eishi Y, Okubo K, Ikeda T.: Pathol Int., in press.
- 19: Sialadenoma papilliferum of the bronchus An unrecognized bronchial counterpart of the salivary gland tumor with frequent BRAF V600E mutations: Nakaguro M, Mari Mino-Kenudson M, Urano M, Ogawa I, Honda Y, Hirai H, Tanigawa M, Sukeda A, Kajiwara N, Ohira T, Ikeda N, Mikami Y, Tada Y, Ikeda J, Matsubayashi J, Faquin W. C, Sadow P. M, Nagao T.: Am J Surg Pathol., in press.
- 20 : A Case of Congenital lymphatic Malformation of the Floor of Mouth : Matsui K, Kanda T, Yoshioka Y, Hamada A, Taguchi Y, Orita M, Sakamoto S, Okamoto T. : Hiroshima Univ Dent Soc., 52(1), 14-19, 2020.

## B) Review

## C) Publications

- 1 : 4. Oral and Maxillary regions: Surgical Pathology 5<sup>th</sup> ed. (Fukayama M, Morinaga S. chief ed., Oda Y, Sakamoto M, Matsuno Y, Moriya T. ed.): Ogawa I.: Bunkodo Co., Ltd. (Tokyo), p.137-168, 2020.
- 2 : Chapter 5. Digestive system (2) Salivary gland: Color atlas of histopathology and differential diagnosis 7<sup>th</sup> ed. (Akagi T, Matsubara O, Manabe T. supervis. ed., Yoshino T, Oda Y, Sakamoto M, Morii E. ed.): Nagao T, Takata T. Ogawa I.: Ishiyaku Pub, Inc. (Tokyo), p.187-195, 2020.

## D) Other Publications



## E) Presentations at Scientific Meetings

- 1 : P. gingivalis-Odontogenic Infection Promotes Development of NASH-Related HCC via Integrin Signaling : Sakamoto S, Miyauchi M. : The 79th Annual Meeting of the Japanese Cancer Association (Hiroshima), 2020.
- 2 : Porphyromonas gingivalis-Odontogenic Infection Promotes Development of NASH-Related HCC : Sakamoto S, Miyauchi M. : The 59th Meeting of Hiroshima Prefectural Dental Association/ The 104th Meeting of Hiroshima University Dental Society (Hiroshima), 2020.
- 3 : EGFR directly phosphorylates MOB1 to regulate the Hippo pathway: Ando T. : The 59th Meeting of Hiroshima Prefectural Dental Association / The 104th Meeting of Hiroshima University Dental Society (Hiroshima), 2020.
- 4 : Role of EGFR-mediated MOB1 phosphorylation on Hippo pathway regulation: Ando T.: The 68th Annual Meeting of Japanese Association for Dental Research (Tokyo), 2020.
- 5 : Regulation of the Hippo Pathway by the EGFR-mediated tyrosine phosphorylation of MOB1: Ando T.: The 31st Annual Meeting of Japanese Society of Oral Pathology (Nagoya), 2020.
- 6 : EGFR regulates the Hippo Pathway by the Direct Tyrosine phosphorylation of MOB1: Ando T.: The 79th Annual Meeting of the Japanese Cancer Association (Hiroshima, web), 2020.
- 7 : Rapid detection of the Porphyromonas gingivalis fimA genotypes II and IV by loop-mediated isothermal amplification: Kitagawa M, Ouhara K, Miyauchi M, Nagamine K, Shiba H.: The joint meeting of the 33rd Annual Meeting of Japanese Society of Oral Diagnosis/Oral Medicine, the 30th Annual Meeting of Japanese Society of Oral Medicine and the 13th Annual Meeting of Japanese Society for Evidence and the Dental Professional (Tokyo), 2020.
- 8 : Retrospective study on the therapeutic effect of zinc acetate hydrate preparations for patients with zinc deficiency dysgeusia : Shintani T., Ohta K., Takechi M., Toratani S., Shiba H. : The 13th Annual Meeting of Japanese Society for Evidence and the Dental Professional (Tokyo), 2020.
- 9 : Rapid genetic testing of cnm positive Streptococcus mutans in oral cavity: Nagamine K, Kitagawa M, Ouhara K, Kurihara H. The 140th Annual Meeting of the Pharmaceutical Society of Japan (Kyoto), 2020.
- 10 : Selective detection of the Porphyromonas gingivalis fimA type II and IV genes by loop-mediated isothermal amplification: Nagamine K, Ouhara K, Okamura Y, Kitagawa M. The 43rd Annual Meeting of the Molecular Biology Society of Japan (Kyoto), 2020.
- 11 : Efforts of dental hygienists at Hiroshima University Hospital Hemophilia Center : Okada M, Shintani T, Kawagoe M, Iwata T, Takeda K, Shindo S, Yoshida K, Yamasaki N, Niizato N, Nakaoka M, Mizuno N, Fujii T, Ohta K, Kozai K, Shiba H. : The 104th Hiroshima University Dental Society Regular Meeting (Hiroshima), 2020.

## F) Case presentations

- 1 : A case of mesenchymal chondrosarcoma of mandible : Sakamoto S, Furusho H, Ono S, Nakamoto T, Miyauchi M, Hirose T, Ogawa I. : The 109th Annual Meeting of the Japanese Society of Pathology (Hakata), 2020.
- 2 : Mandibular gingival tumor (Ghost cell odontogenic carcinoma arising in dentinogenic ghost cell tumor, peripheral) : Sakamoto S, Ando T, Mizuta K, Ishida F, Kato D, Ono S, Konishi M, Miyauchi M, Ogawa I. : The 31st Annual Meeting of the Japanese Society for Oral Pathology (Nagoya), 2020.
- 3 : Maxillary tumor (Odontogenic fibroma, amyloid variant) : Sakamoto S, Ando T, Kanda T, Sueti Y, Nishida T, Ogawa I, Miyauchi M. : 133rd Academic Meeting of Chugoku-Shikoku Branch of the Japanese Society of Pathology (Hiroshima), 2020.
- 4 : Tumor of Parotid gland (Additional report: Lymphadenoma, non-sebaceous type with *CRTC1-MAML2* fusion gene): Ogawa I, Sakamoto S, Ohbayashi M, Miyauchi M, Fujihara M.: 131st Academic Meeting of Chugoku-Shikoku Branch of the Japanese Society of Pathology (Okayama), 2020.
- 5 : A case of suspected first adult herpes infection with airway management: Kanda T, Sakurai S, Iwamasa M, Okamoto K, Koizumi K, Ando T, Yoshioka Y, Toratani S, Okamoto T.: The 30th Congress of the Japanese Society of Oral Medicine, Joint Academic Conference (Tokyo), 2020
- 6 : A Case of central giant cell granuloma of the condyle: Okuda T, Ono S, Tada M, Ishida F, Mizuta K, Uetsuki R, Kakimoto N, Ogawa I, Takechi M.: The 38th Annual Meeting of Japanese Society of Oral Oncology (Tokyo), 2020.

## G) Special lectures in academic meetings

- 1 : Workshop 10/Audience participatory slide conference using the Milan System, WS10-4, salivary gland Milan system, case 11-13 : Sakamoto S, Obayashi M, Ogawa I, Fujihara M. : The 61st Annual Spring Meeting of the Japanese Society of Clinical Cytology (Yokohama), 2020.
- 2 : Dysgeusia and testing : Shintani T. : Norbelpharma In-house Workshop (Hiroshima), 2020.

## (4) Status of Receiving Grants-in Aid for Scientific Research, etc.

- 1 : Grant-in-Aid for Early-Career Scientists: Sakamoto S.: Comprehensive analysis of NASH-related hepatocarcinoma promotion mechanism by *P. gingivalis* infection. 20K18478, 1,600,000 yen
- 2 : Grants-in-Aid for Early-Career Scientists: Ando T.: Exploring receptor type tyrosine kinases regulating Hippo pathway for the treatment of patients with head and neck cancer. 20K18477, 1,100,000 yen
- 3 : Grants-in-Aid for Scientific Research (C): Kitagawa M.: Establishment of rapid detection method for systemic disease-related oral bacterial genes. 20K09940, 1,560,000 yen

4 : Grants-in-Aid for Scientific Research (C): Shintani T.: Development of oral cancer treatment with exosome-derived miRNA that regulates HBp17 / FGFBP1. 19K10332, 1,200,000 yen

(5) Academic Awards, etc.

1 : Sakamoto S.: Outstanding Performance Award, The 31st Annual Meeting of the Japanese Society for Oral Pathology.

2 : Ando T.: JADR/GC Young Investigator Award 2020, The 68th Annual Meeting of Japanese Association for Dental Research

3 : Ando T.: Poster Award, The 31st Annual Meeting of Japanese Society of Oral Pathology

4 : Kitagawa M.: Grand President's Award, The joint meeting of the 33rd Annual Meeting of Japanese Society of Oral Diagnosis/Oral Medicine, the 30th Annual Meeting of Japanese Society of Oral Medicine and the 13th Annual Meeting of Japanese Society for Evidence and the Dental Professional

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## Central Clinical Divisions

### Dental Laboratory

#### (2) Staff and Students

Director of Dental Technicians Section : Hiroki Nikawa (Prof.)  
 Assistant Chief Dental Technician : Ryoji Kato  
 Dental Technician : Eisaku Habu, Yoshihiro Otani, Shogo Iwaguro,  
 Yukihiro Takayama, Mai Ohtaku

#### (2) Main Research Activities

- 10 : Management of the patient's information by the use of implanted devices in the denture.
- 11 : Radioprotective prostheses for irradiation therapies
- 12 : Clinical analysis of superstructure of implant.
- 13 : Esthetic dentistry
- 14 : Accuracy of castings
- 15 : Information processing in the dental laboratory
- 16 : Study on dental composite materials for esthetic

#### (3) Research Achievements

##### C) Original Papers (including Case Reports)

- 6 : Analysis of dimensional change of dental materials on the process of fabricating inlays using three-dimensional data: Hiroto Takenaka, Saiji Shimoe, Shogo Iwaguro, Junichi Fukui, Masato Kaku: Journal of Nippon Academy of Dental Technology, 41(2), 123-131, 2020.
- 7 : Finite-element analysis and optimization of the mechanical properties of polyetheretherketone (PEEK) clasps for removable partial dentures: Tzu-Yu Peng, Yuki Ogawa, Hiroyuki Akebono, Shogo Iwaguro, Atsushi Sugeta, Saiji Shimoe: Journal of Prosthodontic Research: 64(3), 250-256, 2020.
- 8 : Laser-Milled Microslits Improve the Bonding Strength of Acrylic Resin to Zirconia Ceramics : Saiji Shimoe, Tzu-Yu Peng, Yuki Wakabayashi, Hiroto Takenaka, Shogo Iwaguro and Masato Kaku : Polymers, 12(4), pp.817, 2020; doi:10.3390/polym12040817.
- 9 : Color accuracy of different types of monolithic multilayerprecolored zirconia ceramics : Saiji Shimoe, Tzu-Yu Peng, Mai Ohtaku, Nozomi Tsumura, Shogo Iwaguro, Takahiro Satoda : The Journal of Prosthetic Dentistry, 124(6), pp.789.e1-789.e7, 2020.
- 10 : Occlusal support is associated with nutritional improvement and recovery of physical function in

patients recovering from hip fracture: Sawa Y, Kayashita J, Nikawa H.: Gerodontology, 37(1),59-65,2020.

- 11 : Simulation and navigation of living donor hepatectomy using a unique three-dimensional printed liver model with soft and transparent parenchyma: Kuroda S, Kihara T, Akita Y, Kobayashi T, Nikawa H, Ohdan H: Surg Today, 50(3), 307-313,2020.

D) Review

C) Publications

D) Other Publications

E) Presentation at Scientific Meeting

F) Symposium and special lecture

(4) Status of Receiving Grants-in Aid for Scientific Research, etc.

(5) Academic Awards, etc.

(6) Patents

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## Central Clinical Divisions Dental Hygiene Section

### (1) Staff and Students

Director of Dental Hygiene Section : Hidemi Kurihara(by-work, Till March), Ohta Koji(by-work, From April)

Chief Dental Hygienist : Miyuki Nakaoka

Sub Dental Hygienist : Kanako Matsui(Till February)

Dental Hygienists : Atsuko Wakita, Kanako Yano, Tomoko Tokikazu, Miho Okada, Maiko Kawagoe, Chika Kozono, Yuki Hamamoto, Natsumi Ino, Kana Dainobu, Yuka Wakabayashi, Fumi Tokui, Yuika Mizota, Miku Ishikawa(Till March), Mayuko Watari(Till March), Momoko Okizono(Till March), Ayaka Yoshimoto, Saori Ikeda, Nakamura Mariko, Yasuda Haruka, Kimura Shoko, Iwata Sayaka, Nitannya Hina(From April), Yokoyama Yasuko(From April)

Dental Assistants : Tamamoto Yuka, Keiko Kodani, Saori Nagamine, Masuda Ayako, Kumadaki Machiko(Till October)

### (2) Main Research Activities

### (3) Research Achievements

#### A) Original Papers (including Case Reports)

- 1 : A case of hygiene care in refractory stomatitis frequently after living kidney transplantation: Tokui F., Yano K., Nakaoka M., Nishi H.: The journal of japan society for dental hygiene, vol.15 No.1, 45-50, 2020.
- 2 : Effects of perioperative oral care on postoperative inflammation following heart valve surgery: Nishi H., Takahashi S., Ohta K., Takamoto M., Shigeishi H., Obayashi T., Yoshioka Y., Konishi M., Shimizu Y., Yano K., Miyagawa T., Kakimoto N., Ohge H., Kawaguchi H., Kurihara H.: Oral Dis, 2020.
- 3 : Oral environment and taste function of Japanese HIV-infected patients treated with antiretroviral therapy:Shintani T, Fujii T, Yamasaki N, Kitagawa M, Iwata T, Saito S, Okada M, Ogawa I, Unei H, Hamamoto K, Nakaoka M, Kurihara H, Shiba H.Aids Care 2020 Jul; 19; 1-6
- 4 : Clinical Outcomes of Post-exposure Prophylaxis following Occupational Exposure to Human Immunodeficiency Virus at Dental Departments of Hiroshima University Hospital Shintani T, Iwata T, Okada M, Nakaoka M, Yamasaki N, Fujii T, Shiba H.Curr HIV Res 2020; 18 (6); 475-479

## B) Review

## C) Publications

## D) Other Publications

## E) Presentation at Scientific Meeting

- 1 : Changes in the age demographic of dental patients with special needs during the last decade: Furutani C., Miyazaki H., Miyahara K., Tokikazu T., Wakita A., Mizota Y., Takashima S., Hayashiuchi Y., Oda Y.: The 37th Annual Meeting of Japanese Society for Disability and Oral Health(Kanagawa), 2020.
- 2 : A case report of cerebral palsy patient whose overdenture was applied with magnet attachment: Oda Y., Furutani C., Miyahara K., Miyazaki H., Takashima S., Wakita A., Watari M., Mizota Y., Kannda T., Yoshida: The 37th Annual Meeting of Japanese Society for Disability and Oral Health(Kanagawa), 2020.
- 3 : Effects of central command induced by stress experiences on hemodynamic responses: Miyazaki H., Miyahara K., Tokikazu T., Yasuda H., Furutani C., Watari M., Takashima S., Oda Y., Okada Y.: The 37th Annual Meeting of Japanese Society for Disability and Oral Health(Kanagawa), 2020.
- 4 : Age related changes in the frequency of dental prosthesis in disabled patients: Wakabayashi Y., Oda Y., Yasuda H., Furutani C., Miyahara K., Miyazaki H., Takashima S., Nakaoka M., Okada Y.: The 37th Annual Meeting of Japanese Society for Disability and Oral Health(Kanagawa), 2020.
- 5 : Examination of factors affecting the availability of dentures in disabled patients: Yasuda H., Oda Y., Wakabayashi Y., Furutani C., Miyahara K., Miyazaki H., Takashima S., Nakaoka M., Okada Y.: The 37th Annual Meeting of Japanese Society for Disability and Oral Health(Kanagawa), 2020.
- 6 : Action on Disaster Countermeasures in Dental Departments of Hiroshima University Hospital: Kawagoe M., Kawaguchi H., Nakaoka M., Obayashi T., Oka H., Abe Y., Okada Y., Shiba H.: The 104th Dental Society of Hiroshima University(Hiroshima), 2020.
- 7 : Efforts of dental hygienists at Hemophilia Treatment Center of Hiroshima University Hospital: Okada M., Shintani T., Kawagoe M., Iwata T., Takeda K., Shindou T., Yoshida K., Yamasaki N., Niizato N., Nakaoka M., Mizuno T., Fujii T., Oota K., Kozai K., Shiba H.: The 104th Dental Society of Hiroshima University(Hiroshima), 2020.
- 8 : The effects of efforts by dental hygienist in diabetic therapy: Emura Y., Kozono C., Hamamoto Y., Kajiya M., Ino M., Shintani TNakaoka M., Kurihara H., Yoneda M.: The 63rd Annual Meeting of the Japan Diabetes Society (Shiga), 2020.

- 9 : A case of type 2 diabetes complicated with polycystic ovarian syndrome and severe obesity treated With diet therapy in dentistry: Hamamoto Y., Emura Y., Ono H., Shintani T., Matsuda S., Kajiya M., Yoneda M., Kurihara H.: The 63rd Annual Meeting of the Japan Diabetes Society (Shiga), 2020.
- 10 : Team medical care for type 2 diabetic patients - The role of dental hygienists-:kozono C., kajiya M., Memida T., Shintani T., Nagao A., Ono H., Nakaoka M., Kurihara H., Yoneda M.: The 63rd Annual Meeting of the Japan Diabetes Society (Shiga), 2021.

#### F) Lecture

- 1 : Oral care in Special care dentistry: Yano K.: Hiroshima prefecture regional medical care nursing comprehensive securing business Education at Hiroshima Oral Health Center· Research function development project Hiroshima prefecture dental health care service provision difficult person consultation physician training workshop(Hiroshima), 2020.
- 2 : Oral care in Special care dentistry: Tokikazu T.: Hiroshima prefecture regional medical care nursing comprehensive securing business Education at Hiroshima Oral Health Center· Research function development project Hiroshima prefecture dental health care service provision difficult person consultation physician training workshop(Hiroshima), 2020.
- 3 : Dental and hemophilia treatment-from the standpoint of a dental hygienist-:Okada M.: Multidisciplinary collaboration hemophilia treatment Seminar (Hiroshima), 2020.
- 4 : Oral bacteria -the effective oral care-:Hamamoto Y.: The seminar of pediatric cancer nursing (Hiroshima), 2020.
- 5 : Correspondence of patients with dental psychosomatic disorder and case study: Yano K.: Center for Dental Hygienists' Education and Training(Hiroshima), 2020.

(4) Status of Receiving Grants-in Aid for Scientific Research, etc.

(5) Academic Awards, etc.

(6) Patents

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