

**Division of Geriatric Dentistry**  
**Department of Human Biology and Pathophysiology**

## Outline

More over a quarter of the total Japanese population are the elderly. It has become much more important to advance the research of geriatric dentistry. Our major research topics are to understand aging of stomatognathic system, to study causes, pathology, symptoms and diagnosis of deterioration of oral function and dysphagia, and to learn the treatment methods for both. We perform translational research based on biological and epidemiological approaches in the field of geriatric dentistry. Our ongoing research projects are shown below.

## Faculty members

Professor; Hideki Aita D.D.S., Ph.D.  
Assistant professor/research associate ; Hikari Odachi D.D.S.  
Syuhei Kemuriyama D.D.S., Ph.D.  
Clinical instructor; Ryousuke Imasato D.D.S.  
Kano Fujimaru D.D.S.

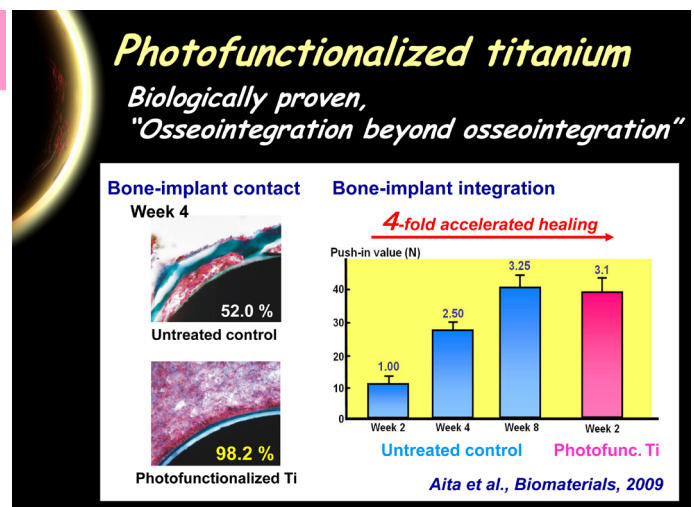
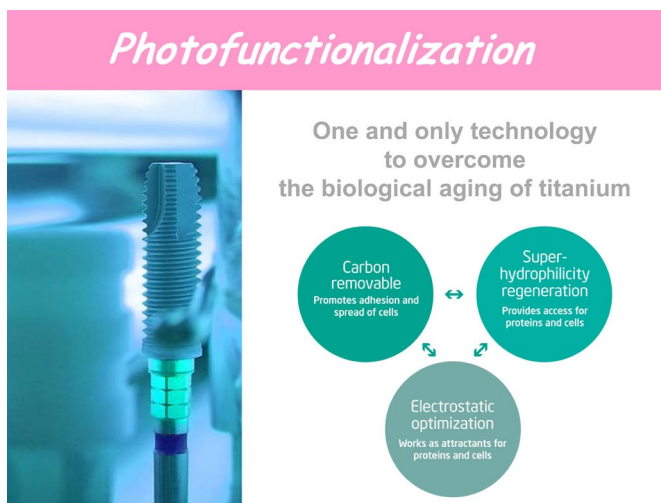


## Research collaborator

Tomomi Matsue Ph.D.

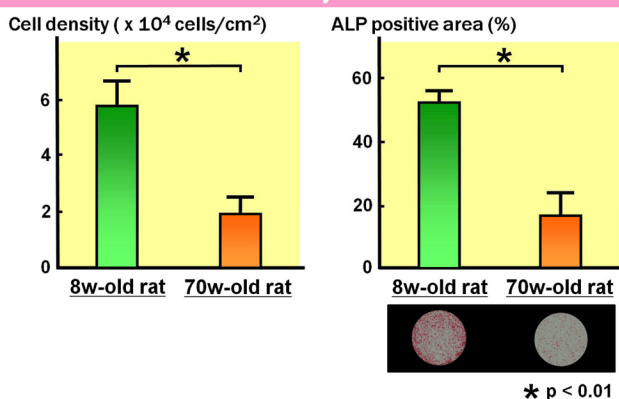
## Main research in progress

### 1) Translational research on biofunctionalization of titanium

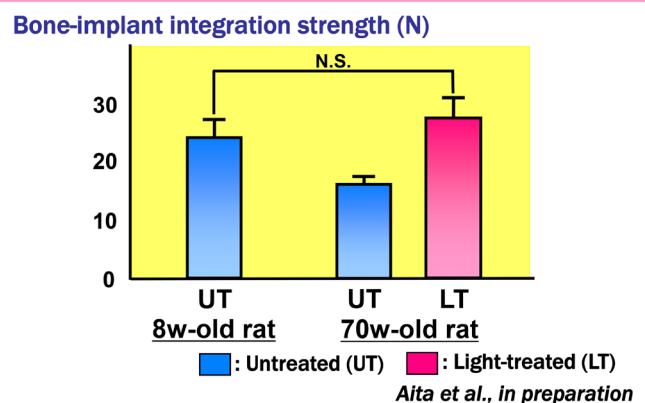


<https://ogawalabteamsurface.dentistry.ucla.edu/>

### **Aging of host decreases the activity of osteoblasts**

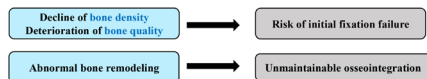


### **Photofunctionalization can compensate for age-related impaired osteoblastic response**

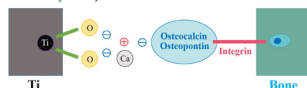


## Risks and Remedies for Implant Treatment in Osteoporosis Patients

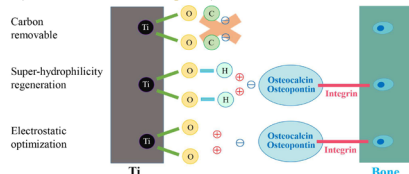
### Risks of osteoporosis in implant treatment



### Osseointegration ( Untreated control implant )

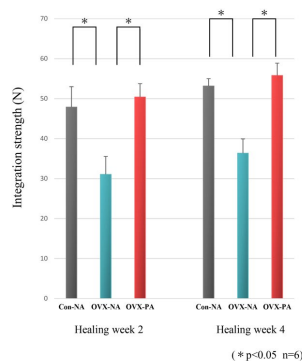


### Osseointegration ( Photofunctionalized implant )

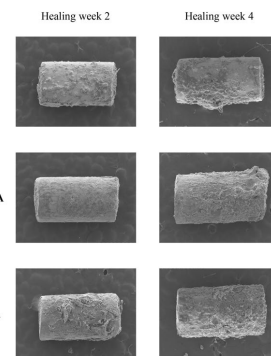


## Effect of Photofunctionalization of Titanium in Rat Osteoporosis Model

### Biomechanical push-in test



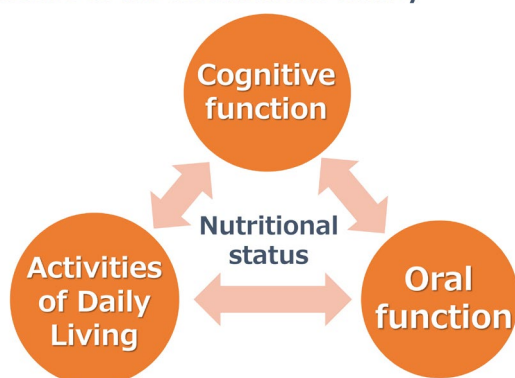
### SEM observation



Kemuriyama et al., Dent Mater J, 2023

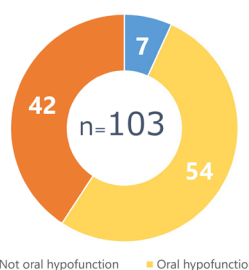
- 2) Effect of home-visit dental treatment for the elderly on the maintenance of dentition and stomatognathic function
- 3) Relationship between stomatognathic function and cognitive function in the elderly

### Study on the predictors of oral functional decline in the institutional elderly

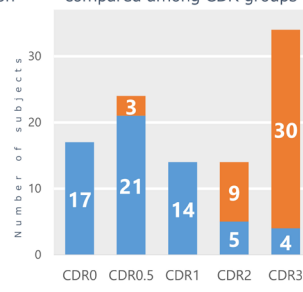


### Study on the predictors of oral functional decline in the institutional elderly

- Assessment of oral function 3 or more signs or symptoms
- Diagnosed with oral hypofunction



- Assessment of oral function Oral functional assessments compared among CDR groups



Matsue (Alumnae) et al., Japanese Journal of Gerodontology 2021

## Current publications

- \* Kimura-Ono, Maekawa, Kuboki, Nawachi, Fujisawa, Sato, Aita et al. Prosthodontic treatment can improve the ingestible food profile in Japanese adult outpatients. J Prosthodont Res 67, 189-195, 2023.
- \* Kemuriyama, Aita et al. Effect of photofunctionalization on titanium bone-implant integration in ovariectomized rats. Dent Mater J 42:11-18, 2023.
- \* Matsue, Aita, Yamada, Kawakami, Hirai. Predictors of deteriorated oral function for older adults in long-term care insurance facilities : Focusing on rinsing ability and activities of daily living evaluated by care providers. Jpn J Gerodontology 36, 227-38, 2021. [published in Japanese]
- \* Ichioka, Kado, Aita et al. In vitro evaluation of NaOCl-mediated functionalization of biologically aged titanium surfaces. Dent Mater J 40, 74-83, 2021.
- \* Kawanishi, Okahashi, Aita et al. Usefulness of the newly developed artificial denture plaque for practical denture care training. Clin Exp Dent Res 6, 254-265, 2020.
- \* Kado, Aita et al. Chemical modification of pure titanium surfaces to enhance the cytocompatibility and differentiation of human mesenchymal stem cells. Dent Mater J 38:1026-35, 2019.
- \* Kono, Aita et al. NaOCl-mediated biofunctionalization enhances bone-titanium integration. Dent Mater J 34:537-44, 2015.
- \* Kado, Hidaka, Aita et al. Enhanced compatibility of chemically modified titanium surface with periodontal ligament cells. Applied Surface Science 262, 240-247, 2012.
- \* Aita et al. Application of UV light-induced biofunctionalization to titanium implant surface. Bull Kanagawa Dent Coll 39:37-39, 2011.
- \* Aita et al. The effect of ultraviolet functionalization of titanium on integration with bone. Biomaterials 30:1015-25, 2009.