

Advanced Biomaterials

1. Staffs and Students (April, 2009)

Associate Professor	Hidekazu TAKAHASHI
Assistant Professor	Hideo NAKAMURA
Research Associate	Naohiko IWASAKI
Research Student	Mitsufumi ASAKURA
Research Student	Ken-ichi BABASONO

2. Purpose of Education

Dental material science is not only one of basic medical and dental science but also one of clinical dental science. In our department, we will educate students to obtain practical knowledge of the dental materials and devices used in dentistry and to improve skill how to deal with these materials and devices. Our goals of education is to achieve high quality of dental practice with well-understanding dental material and devices.

The aim for undergraduate education is to obtain the basic knowledge of dental material science and technology. The lecture is simultaneously provided with the laboratory instructions within the limit of the possible.

The main program for graduate student is composed of the lecture and laboratory instructions for understanding physical and chemical properties of new materials and technology for dental use. Recent researches in our department will be also introduced.

3. Research subjects:

1. Evaluation of various factors on mechanical properties of teeth substance.
2. Evaluation of fatigue properties of dentin and dental materials using miniature testing pieces
3. Measurement of characteristics of dental ceramic materials and establishment of new testing methods for dental ceramics
4. Measurement of precise deformation using non-contact methods
5. Development of new composite resin with similar machinability of dentin
6. Study on dental root fracture mechanism
7. Application of various types of fiberglass for dentistry
8. Evaluation of composite resin mechanical properties and improvement their bonding efficiency to various materials.
9. Evaluation of impact force absorption of mouthguard and face protect materials

4. Publications

Original Articles

1. Loyaga-Rendon P, H. Takahashi, N. Iwasaki: Bonding of UV-irradiated composite resin teeth to acrylic after thermocycles. *Dent Mater.* 25(5): e33-e34, 2009
2. Amarana B, Mizutani H, Takahashi H, Igarashi Y: Stability of mandibular overdentures before and after attachment wear. An in vitro study: *Ann Jpn Prosthodont Soc.* 1(1): 77-84, 2009
3. Sakai T, Hideshima M, Takahashi H, Ichinose S, Igarashi Y; Effect of mold temperatures on interface between primary and secondary casting of cast-on method for precision metal frameworks. *J Prosthodont Res.* 53(2): 60-66, 2009
4. Reza F, Zhang Z, Tamaki Y, Takahashi H, Hotta Y, Miyazaki T: A gypsum-bonded magnesia investment is available for titanium casting. *Dental Med Res.* 29(1): 21-27, 2009
5. Reza F, Zhang Z, Tamaki Y, Takahashi H, Iwasaki N, Miyazaki T. Properties of gypsum-bonded magnesia investment using K₂SO₄ solution for titanium casting. *Dent Mater J.* 28(3): 301-306, 2009
6. Ihara C, Takahashi H, Matsui R, Yamanaka T, Ueno T: Bonding durability of custom-made mouthpiece for scuba diving after water storage under pressure. *Dent Mater J.* 28(4): 487-492, 2009
7. Hirajima Y, Takahashi H, Iwasaki N, Minakuchi S: Influence of a denture strengthener on the deformation of a maxillary complete denture. *Dent Mater J.* 28(4): 507-512, 2009
8. Nagata K, Takahashi H, Ona M, Hosomi H, Wakabayashi N, Igarashi Y: Reinforcement effects of fiberglass on telescopic dentures using a three-dimensional finite element analysis and fracture test. *Dent Mater J.* 28(5): 649-656, 2009
9. Iwaki M, Akiba N, Minakuchi S, Takahashi H: Influence of methyl mercaptan at early setting stages on the

- properties of self curing addition silicone resilient denture lining materials. *J Prosthodont Res*, 53(4): 161-165, 2009
10. Yavirach P, Chaijareenont P, Koottathape N, Takahashi H, Arksornnukit M: Effects of plasma treatment on the shear bond strength between fiber-reinforced composite posts and resin composite for core build-up, *Dent Mater J*. 28(6): 682-692, 2009
 11. Phunthikaphadr T, Takahashi H, Arksornnukit M: Pressure transmission and distribution under impact load using different types of artificial denture teeth. *J Prosthet Dent*. 102: 319-328, 2009