Evaluation of biocompatibility with bone of titanium materials by the immersion in simulated body fluid

Dept. of Materials Science and Engineering
Biomdeical Materials Narushima Lab.

- Instructors: Dr. Kyosuke UEDA (Tel: 795-7295, E-mail: ueda@material.tohoku.ac.jp)
  Dr. Takayuki NARUSHIMA (Tel: 795-7294, E-mail: narut@material.tohoku.ac.jp)

- Members: 8 persons
- Schedule: Sept. 2017
  (Held in about total 2 weeks, Details will be decided by members)
- Guidance: 1st September (Mon.) 13:30～
  Mater. Sci. Eng., Education and Research Build. (B01) 4th floor, 407

Titanium and its alloys have been applied as a substitute for hard tissues in orthopedic and dental fields, such as hip joint and dental implants because of their excellent mechanical properties and corrosion resistance. It is known that titanium materials can be directly connected to living bones at the optical microscopic level, i.e., osseointegration, and this property can be evaluated by the apatite formation by immersion test in simulated body fluids.

In this seminar, (I) titanium alloys are designed for the high biocompatibility with bone and fabricated by yourself, and then (II) immersion test in the simulated body fluid for the evaluation of apatite formation rate is conducted.

### Design of the titanium alloy
- Arc-melting of the alloy
- Hot-rolling and machining
- NaOH+heat treatment

### Immersion test
- Immersion in simulated body fluid
- Evaluation of apatite formation rate (XRD, SEM)

Before immersion

After immersion

Apatite

Hip joint  Dental implant