



Yuji TANABE, Dr. Eng.

Professor

Program: Advanced Materials Science and Technology

Area: Advanced Mechanical Science and Engineering

Undergraduate: Dept. of Engineering

Professional Expertise

His professional expertise is mainly related to strength and fracture of materials, biomechanics and biomaterials, especially in wide and interdisciplinary research areas such as materials characterisation at high strain rates by the use of Hopkinson pressure bar technique, experimental and numerical evaluation of structural integrity based on fracture mechanics, orthopaedic biomechanics, low or non-invasive medical diagnosis by the use of near infrared spectroscopy, and so on.

Research Fields of Interest

Materials Characterisation

- Application of Split- Hopkinson pressure bar (SHPB) technique to any kind of material
- Formulation of constitutive law applicable to wide range of strain rate

Experimental and Numerical Evaluation of Structural Integrity

- Fracture due to high loading rate
- Stress corrosion cracking of pressure vessels and pipes in nuclear reactor

Orthopaedic Biomechanics

- Bone biomechanics with the inclusion of deformation and fracture of articular cartilage
- Reconstruction of 3D bone model by the use of MRI and CT image data
- 3D motion analysis of knee and hip joints
- Mechanical analysis of surgical techniques

Biomaterials

- Wear aspects of UHMWPE
- Mechanical evaluation of medical devices used for orthopaedic surgery

Education

1988: Awarded the degree of DEng in Mechanical Engineering, Tohoku University, Japan

1981: Awarded the degree of MEng in Mechanical Engineering, Niigata University, Japan

1978: Awarded the degree of BEng in Marine Mechanical Engineering,
Tokyo Mercantile Marine University, Japan

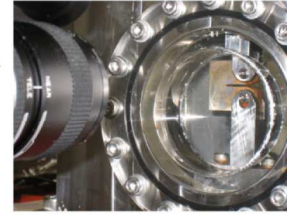
Professional Societies and Activities

1. The Japan Society for Mechanical Engineers
2. Councilor, The Japanese Society for Experimental Mechanics
3. Councilor, The Society of Materials Science, Japan
4. Councilor, Japanese Society for Clinical Biomechanics
5. Councilor, The Japanese Society for Non- Destructive Inspection

Awards

1. Best paper presentation 2005 at Annual meeting of the Japan Society for Mechanical Engineers 2005
2. Best scientific article 2007 in Japanese Journal of Experimental Mechanics, The Japanese Society for Experimental Mechanics

Stress Corrosion
Cracking Experiment
on SUS316L NG
(Test in progress)



Major Publications

Papers

*Materials Characterisation

[1] Identification of the Dynamic Properties of Bone Using the Split-Hopkinson Pressure-Bar Technique, Yuji Tanabe, Koichi Kobayashi, Makoto Sakamoto, Toshiaki Hara, Hideaki Takahashi, ASTM Standard Technical Publication 1173, pp.127-141, 1994

*Experimental and Numerical Evaluation of Structural Integrity

[1] Simulation Technique for One-Dimensional Elastic Wave Propagation, Hiroshi Shibata, Yuji Tanabe, Sotomi Ishihara, International Journal of Modern Physics B, Vol.22, Nos.9, 10&11, pp.1564-1569, 2008

*Orthopaedic Biomechanics

[1] In Vivo Contact Areas of Tibiotalar Joint Measured with Magnetic Resonance Imaging, Makoto Sakamoto, Yosei Nodaguchi, Yuji Tanabe, Keisuke Sasagawa, Yosuke Kubota, Hidenori Yoshida, Koichi Kobayashi, Journal of JSEM Vol.10, Special Issue, pp.234-239, 2010

[2] Numerical Analysis of Pressure on Cup Surface after THA, Shin Kai, Makoto Sakamoto, Koichi Kobayashi, Izumi Minato, Yoshio Koga, Yuji Tanabe, Journal of JSEM Vol.10, Special Issue, pp.251-255, 2010

[3] Biomechanical Analysis of Acetabular Defects Reconstruction with Impaction Bone Grafting in Revision Total Hip Arthroplasty, Yuji Tanabe, Tomoyuki Yamazawa, Satoshi Iida, Shunji Kishida, Hirotsugu Ohashi, Journal of JSEM Vol.10, Special Issue, pp.256-260, 2010

[4] Three-dimensional In Vivo Contact Analysis of the Wrist Joint during Wrist Motion, Keisuke Sasagawa, Makoto Sakamoto, Hidenori Yoshida, Koichi Kobayashi, Yuji Tanabe, Journal of JSEM Vol.10, Special Issue, pp.261-266, 2010

*Biomaterials

[1] Impact Tensile Properties of Structural Sintered Steels, Kinya Kawase, Yuji Tanabe, Tomoyuki Yamazawa, Hiroaki Suzawa, Journal of JSEM Vol.11, Special Issue, pp.221-226, 2011

[2] Mechanical properties of microporous foams of biodegradable plastic, Desalination and Water Treatment, T. Tanaka, T. Aoki, T. Kouya, M. Taniguchi, W. Ogawa, Y. Tanabe, D. R. Lloyd, , 17 (2010) pp.37-44, 2010

[3] Load Transmission Through Artificial Hip Joints due to Stress Wave Loading, Yuji Tanabe, Takanori Uchiyama, Hironori Yamaoka, Hirotsugu Ohashi, International Journal of Modern Physics B, Vol.22, Nos.9, 10&11, pp.1789-1794, 2008

Book Chapters

[1] H. E. Takahashi (Ed.), 1999, Anisotropic Behavior in Viscoelasticity and Fracture Mechanics of Compact Bone, Mechanical Loading of Bones and Joints, Springer-Verlag Tokyo.

[2] Toshiaki HARA, Yuji TANABE, Makoto SAKAMOTO, 1999, Biomechanics of Articular Joints : Review of a Decade of Progress of the Niigata Biomechanics Group, Mechanical Loading of Bones and Joints, Springer-Verlag Tokyo.

[3] Yuji Tanabe, Hiroshi Maki, Takashi Meguro, Akio Kobayashi, Hirotsugu Ohashi, Yoshinori Kadoya, Yoshiki Yamano, 2000, Mechanical Properties of Impacted Human Morsellised Cancellous Allografts for Revision Joint Arthroplasty, Human Biomechanics and Injury Prevention, Springer-Verlag Tokyo.

[4] J.Middleton, N.G.Shrive, M.L.Jones (Eds.), 2004, Computer Methods in Biomechanics & Biomedical Engineering-4, University of Wales College of Medicine, #814,pp.1-6.

[5] Y.Koga. (Ed.), Y.Tanabe. et al, 2008, Osteoarthritis of the Knee –Epidemiology, Biomechanics and Conservative Treatment-, Nan-kodo .pp.101-104.