



RIEC

Research Institute of Electrical Communication
Tohoku University

**The Joint Symposium of
8th International Symposium on
Medical, Bio- and Nano-Electronics,
and
5th International Workshop on
Nanostructures & Nanoelectronics**

Organized by

**Research Institute of Electrical Communication
Tohoku University**

March 5-7, 2014

**Laboratory for Nanoelectronics and Spintronics
Research Institute of Electrical Communication
Tohoku University**

**The Joint Symposium of
8th International Symposium on Medical, Bio- and Nano-Electronics,
and
5th International Workshop on Nanostructures & Nanoelectronics**

March 5-7, 2014

**Site: Laboratory for Nanoelectronics and Spintronics, Research
Institute of Electrical Communication, Tohoku University**

Organizer:

Symposium Co-Chairs

Michio Niwano, Tohoku Univ.

Masashi Sahashi, Tohoku Univ.

Program Committee

Tatsuo Yoshinobu, Tohoku Univ.

Yasuo Kimura, Tohoku Univ.

Organizing Committee

Yasuo Kimura, Tohoku Univ.

Ko-ichiro Miyamoto, Tohoku Univ.

Program

March 5 (Wednesday)

Room: 4F, Conference Room, *Laboratory for Nanoelectronics and Spintronics*

- 13:30 ~ 13:35 Opening Remarks
Michio Niwano (Tohoku University, Japan)
(Chair: Toshio Ogino)
- 13:35 ~ 14:20 Self-organized TiO₂ nanotube arrays: Latest features and applications
Patrik Schmuki (University of Erlangen Nuremberg, Germany)
- 14:20 ~ 14:40 Formation of an anodic titanium oxide nanotube film and its application to a front-illuminated dye-sensitized solar cell
Ryota Kojima, Teng Ma, Yasuo Kimura, and Michio Niwano (Tohoku University, Japan)
- 14:40 ~ 15:00 Fabrication of highly ordered structure in TiO₂ nanotubes for hybrid solar cells
Teng Ma, Ryota Kojima, Daisuke Tadaki, Yasuo Kimura, and Michio Niwano (Tohoku University, Japan)
- 15:00 ~ 15:20 Metal-supported titanium oxide nanotube micro gas sensors
Yasuo Kimura (Tohoku University, Japan)
- 15:20 ~ 15:30 Coffee break
- (Chair: Yasuo Kimura)
- 15:30 ~ 16:00 Functional Applications of Nanostructured Silicon
Nobuyoshi Koshida (Tokyo University of Agriculture and Technology, Japan)
- 16:00 ~ 16:30 Reliable Metaldeposition into TiO₂ Nanotubes and Use in Interdigitated Electrode Structures
Ning Liu, and Patrik Schmuki (University of Erlangen-Nuremberg, Germany)
- 16:30 ~ 16:50 Growth and functionalization of low-dimensional nanocarbons by advanced plasma processing
Toshiaki Kato, Bin Xu, Hiroo Suzuki, Toshiro Kaneko (Tohoku University, Japan)
- 16:50 ~ 17:10 Self-Shaping Deposition of Monolayer Graphene Oxide Flakes on Chemically Modified Surfaces
Toshio Ogino and Toshiyuki Takami (Yokohama National University, Japan)

March 6 (Thursday)

Room: 4F, Conference Room, *Laboratory for Nanoelectronics and Spintronics*

(Chair: Yasuo Kimura)

- 9:00 ~ 9:30 Interaction of spin polarized electrons with adsorbed chiral molecules: reactions and transport
Richard Rosenberg (Advanced Photon Source, Argonne National Laboratory, Argonne, IL, USA)
- 9:30 ~ 9:50 Excitation of light emission by electron tunneling in the THz spectral range
T. Tsunoda, S. Katano, and Y. Uehara (Tohoku University, Japan)
- 9:50 ~ 10:10 Tunable preparation of graphene oxide and its metal nanoparticle composites
Yuta Nishina^{1,2} (¹RCIS Okayama University, ²JST PRESTO, Japan)
- 10:10 ~ 10:30 Room temperature atomic layer deposition of oxide films on flexible materials
F. Hirose, K. Kanomata, S. Kubota, and K. Hirahara (Yamagata University, Japan)
- 10:30 ~ 10:40 Coffee break

(Chair: Ko-ichiro Miyamoto)

- 10:40 ~ 11:10 Tools for chip-based recording and stimulation of neuronal network activity
Philipp Rinklin¹, Martin Hüske¹, Alexey Yakushenko¹, Cony Herrera¹, Kay Krause¹, Anna Czeschik¹, Enno Kästelhön¹, Andreas Offenhäusser^{1,2}, and Bernhard Wolfrum^{1,2} (¹Institute of Bioelectronics (PGI-8/ICS-8) and JARA—Fundamentals of Future Information Technology, Forschungszentrum Jülich, Germany, ²IV. Institute of Physics, RWTH Aachen University, Germany)
- 11:10 ~ 11:30 Microfabricated Si chips with integrated hERG channels as a platform for drug safety screenings
Ayumi Hirano-Iwata¹, Yutaka Ishinari¹, Yasuo Kimura², and Michio Niwano^{1,2} (¹Graduate School of Biomedical Engineering, Tohoku University, ²RIEC, Tohoku University, Japan)
- 11:30 ~ 13:00 Lunch
- 13:00 ~ 14:20 Poster session

(Chair: Shinichiro Umemura)

- 14:30 ~ 15:00 On the Science of Sonoporation: Biophysical Dynamics and Subcellular Impact
Alfred Cheuk Hang Yu (University Hong Kong, China)
- 15:00 ~ 15:30 Roles of High-Speed Imaging in Ultrasound-Guided HIFU Treatment
S. Umemura, S. Sasaki, H. Sasaki, R. Takagi, K. Matura, and S. Yoshizawa (Tohoku University, Japan)

15:30 ~ 16:00 High Frame Rate Ultrasonography for Measurement of Tissue Dynamics
Hideyuki Hasegawa and Hiroshi Kanai (Tohoku University, Japan)

16:00 ~ 16:15 Coffee break

(Chair: Ko-ichiro Miyamoto)

16:15 ~ 16:45 Fabrication of fiber optic biosensor based on surface-enhanced Raman scattering
Takashi Katagiri¹, Masahiro Nagaoka², Yuji Matsuura^{1,2} (¹School of Engineering and ²Graduate School of Biomedical Engineering, Tohoku University, Japan)

16:45 ~ 17:15 Osteoblast and macrophage response to hydroxyapatite and alpha-type alumina adsorbed with bovine serum albumin
M. Kawashita¹, J. Hayashi¹, T. Kudo² and H. Kanetaka² (¹Graduate School of Biomedical Engineering and ²Graduate School of Dentistry, Tohoku University, Japan)

17:15 ~ 17:45 Recent developments and applications of the chemical imaging sensor systems
Tatsuo Yoshinobu (Tohoku University, Japan)

March 7 (Friday)

Room: 4F, Conference Room, *Laboratory for Nanoelectronics and Spintronics*

(Chair: Toshiro Kaneko)

9:00 ~ 9:30 Development of Medical Plasma Equipment for Blood Coagulation as a Novel Minimally Invasive Treatment

Hajime Sakakita¹, Yuzuru Ikehara¹, Nobuyuki Shimizu², Satoru Kiyama¹, Sanae Ikehara¹, Jaeho Kim¹, Hayao Nakanishi³ (¹National Institute of Advanced Industrial Science and Technology (AIST), Japan, ²SANNO Hospital, International University of Health and Welfare, Japan, ³Aichi Cancer Center Research Institute, Japan)

9:30 ~ 10:00 Control of Cell Membrane Transport Using Atmospheric Pressure Non-Equilibrium Plasma

Toshiro Kaneko¹, Shota Sasaki¹, and Makoto Kanzaki² (¹Department of Electronic Engineering and ²Department of Biomedical Engineering, Tohoku University, Japan)

10:00 ~ 10:15 Coffee break

(Chair: Masashi Sahashi)

10:15 ~ 10:45 Multifunctional Fe₃O₄-ZnO Core-Shell Nanocrystals for Dendritic Cell-based Cancer Immunotherapy

Young Keun Kim (Korea University, Korea)

10:45 ~ 11:15 Study of Biological Applications using Nanostructures: AFM based Nano-Bio Applications

Yu Jin Kim (Korea University, Korea)

11:15 ~ 11:45 Structure and dynamics on submicron scales in Phosphatidylinositol-Containing Supported Lipid Bilayers

Ryugo Tero¹, Toshinori Motegi¹, Kingo Takiguchi², Yohko Tanaka-Takiguchi² (¹ Toyohashi University of Technology, Japan, ²Nagoya Univ., Japan)

11:45 ~ 13:15 Lunch

(Chair: Masashi Sahashi)

13: 15 ~ 13:45 Voltage Controlled Magnetization Switching with Magnetoelectric (ME) Effect in Sesquioxide

Tatsuo Shibata¹, Takuya Ashida², Michihiro Oida², Naoki Shimomura², Tomohiro Nozaki², Atsuo Ochi¹, and Masashi Sahashi² (¹Advanced Technology Development Center, TDK Corporation, Japan, ²Tohoku University, Japan)

- 13:45 ~ 14:15 Anisotropic magnetoresistance of Co/Pt nano-contacts
Muftah Al-Mahdawi, Yohei Shiokawa, and Masashi Sahashi (Tohoku University, Japan)
- 14:15 ~ 14:45 Study on Tunneling Magneto-Resistance in Hexagonal $Mg_xZn_{1-x}O$ based MTJs Prepared by Molecular Beam Epitaxy
M. Belmoubarik¹, H. Sato¹, T. Nozaki¹, H. Endo², and M. Sahashi¹ (¹Tohoku University, ²Iwate Industrial Research Institute, Japan)
- 14:45 Closing

