

## PROGRAMME

### FRIDAY, 26 MARCH

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13:00-13:10 OPENING ADDRESS:

**Progress of NanoBME Research and Education at Tohoku University for Three Years – 2007-2009**

Takami Yamaguchi

(Leader, The Tohoku University Global COE Programme “Global Nano-Biomedical Engineering Education and Research Network Centre” )

SESSION I (Chair: Prof. Matsuhiko Nishizawa)

13:10-13:30 **Developing the Next-generation Medical Equipment Utilizing Technology of Non-contact Energy Transmission through Electromagnetic Field**

Hidetoshi Matsuki (Graduate School of Biomedical Engineering, Tohoku University)

13:30-13:50 **Development of a Ubiquitous Communications System for Home-Visit Medical Services: the Electronic Doctor's Bag**

Tomoyuki Yambe (Institute of Development, Aging and Cancer, Tohoku University)

13:50-14:10 **Cancer Research based on Nano-Biotechnology: Molecular Imaging of Cancer Cells and Sentinel Lymph Node Detection**

Noriaki Ohuchi (Graduate School of Medicine, Tohoku University)

14:10-14:30 **Expanding Capsule for Diet Control**

Tomoyuki Yambe (Institute of Development, Aging and Cancer, Tohoku University)

14:30-14:50 **Analysis of Tumor Suppressor Gene using Molecular Imaging for Personalized Medicine**

Natsuko Chiba (Institute of Development, Aging and Cancer, Tohoku University)

14:50-15:10 BREAK

SESSION II (Chair: Prof. Natsuko Chiba)

15:10-15:30 **System Integration Based on Micro-Nanotechnology and Biomedical Applications -Enucleation of Oocyte by Microrobots on a Chip-**

Fumihito Arai (Graduate School of Engineering, Tohoku University)

15:30-15:50 **Manipulating Cellular Assembly for Advanced Bioassay**

Matsuhiko Nishizawa (Graduate School of Engineering, Tohoku University)

15:50-16:10 **Audio-visual Speech in Impaired Listening Condition -Auditory Training with Bimodal Audio-visual Stimuli-**

Tetsuaki Kawase (Graduate School of Biomedical Engineering, Tohoku University)

16:10-16:30 **Nano-bio-imaging with Radiopharmaceuticals and Application to Health Sciences**

Manabu Tashiro (Cyclotron and Radioisotope Center, Tohoku University)

16:30-16:50 **Development of imaging probes for Positron Emission Tomography**

Shozo Furumoto (Graduate School of Medicine, Tohoku University)

18:00-20:00 BANQUET

**SATURDAY, 27 MARCH**

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**SESSION III** (Chair: Prof. Hiroshi Kanai)

- 9:00-9:20 **Development of Fully Implantable Retinal Prosthesis using Backside TSV and Pillar Electrode Array**  
Tetsu Tanaka (Graduate School of Biomedical Engineering, Tohoku University)
- 9:20-9:40 **Development of the Phase-Mode LAPS and its Application to Chemical Imaging**  
Tatsuo Yoshinobu (Graduate School of Biomedical Engineering, Tohoku University)
- 9:40-10:00 **Sensor System using Functional Material**  
Mami Tanaka (Graduate School of Biomedical Engineering, Tohoku University)
- 10:00-10:20 **Fall-prevention Control of Walking Assist System**  
Kazuhiro Kosuge (Graduate School of Engineering, Tohoku University)
- 10:20-10:40 BREAK

**SESSION IV** (Chair: Prof. Tatsuo Yoshinobu)

- 10:40-11:00 **Evaluation of Transient Change in Viscoelasticity of Arterial Wall during Flow-Mediated Dilation**  
Hiroshi Kanai (Graduate School of Engineering, Tohoku University)
- 11:00-11:20 **Age-related Changes of Brain Structure and Network Properties-Analyses of Brain MRI Database of Healthy Japanese**  
Hiroshi Fukuda (Institute of Development, Aging and Cancer, Tohoku University)
- 11:20-11:40 **Clinical Application of Multidetector-row Computed Tomographic Evaluation of the Fine Vascular Structures**  
Kei Takase (Graduate School of Medicine, Tohoku University)
- 11:40-12:00 **Enhancement of Ultrasonic Heating by Microbubbles and their Tissue-Selective Localization using Nano-Droplet Precursors**  
Shin-ichiro Umemura (Graduate School of Biomedical Engineering, Tohoku University)
- 12:00-13:30 LUNCH BREAK & POSTER SESSION

**SESSION V** (Chair: Prof. Hiroshi Fukuda)

- 13:30-13:50 **Computational Biomechanics for Investigating Various Cardiovascular Diseases**  
Takami Yamaguchi (Graduate School of Biomedical Engineering, Tohoku University)
- 13:50-14:10 **Determination of Local Fine Structure of Blood Flows by Measurement Coupled Simulation**  
Toshiyuki Hayase (Institute of Fluid Science, Tohoku University)
- 14:10-14:30 **Reorganization of Actin Cytoskeleton by Local Stimulation with Magnetic Tweezer**  
Masaaki Sato (Graduate School of Biomedical Engineering, Tohoku University)
- 14:30-14:50 **Site-directed Mutagenesis of the Motor Protein Prestin**  
Hiroshi Wada (Graduate School of Engineering, Tohoku University)
- 14:50-15:10 BREAK

**SESSION VI** (Chair: Prof. Tetsu Tanaka)

*Invited Lecture*

- 15:10-15:50 **Deformability Based Microfluidic Sorters for Diseased Cell Separation**  
Chwee Teck Lim (Division of Bioengineering & Department of Mechanical Engineering, National University of Singapore)
- 15:50- AWARDS PRESENTATION & ADJOURNMENT

POSTER SESSION

- 1. Effect of Pneumothorax on Morphology and Hemodynamic of Pulmonary Artery**

Jean-Joseph Christophe, Takuji Ishikawa, Noriaki Matsuki,  
Yohsuke Imai, Kei Takase, Marc Thiriet, and Takami Yamaguchi

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- 2. Numerical Investigation of Bacteria Swimming Near a Solid Surface**

Davide Giacché, Takuji Ishikawa, and Takami Yamaguchi

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- 3. Changes in Distribution of Paxillin and Integrin  $\beta 1$  in Endothelial Cells in Response to Cyclic Stretch**

Wenjing Huang, Kazuhiko Hanamura, Naoya Sakamoto, Toshiro Ohashi, and Masaaki Sato

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- 4. Eigenvalue Analysis for Error Dynamics of Measurement-Integrated Simulation of Blood Flow**

Kentaro Imagawa, Takakazu Funamoto, and Toshiyuki Hayase

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- 5. Increase in TNF- $\alpha$  Production from Macrophages Exposed to Cyclic Stretch**

Koki Oya, Naoya Sakamoto, Toshiro Ohashi, and Masaaki Sato

111
- 6. Radial Dispersion of Tracer Particles in Blood Flow in a Capillary Tube**

Maryam Saadatmand, Takuji Ishikawa, Noriaki Matsuki,  
Mohammad Jafar Abdekhodaie, Yohsuke Imai, Hironori Ueno, and Takami Yamaguchi

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- 7. US Imaging of Tumor Angiogenesis with Microbubbles in Lymph Node Metastasis Model**

Li Li, Rui Chen, Sachiko Horie, Yukiko Watanabe, Maya Sakamoto,  
Shiro Mori, Kei Takase, Shoki Takahashi, and Tetsuya Kodama

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- 8. Acoustic Impedance Evaluation of HIFU-exposed Biological Tissue using Ultrasonic Microscopy**

Takashi Shishitani, Shin Yoshizawa, and Shin-ichiro Umemura

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- 9. Sex Effects on Small-world Organization of Structural Brain Networks in Young Healthy Individuals**

Kai Wu, Yasuyuki Taki, Kazunori Sato, Shigeo Kinomura, Ryoji Goto,  
Kentaro Inoue, Ken Okada, Ryuta Kawashima, and Hiroshi Fukuda

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- 10. Impact of Remnant Stress/Strain in 3D Stacked Retinal Chip by Wafer Thinning and Bonding**

Hisashi Kino, Tatsuro Hiraki, Mariappan Murugesan, Jicheol Bea,  
Takafumi Fukushima, Mitsumasa Koyanagi and Tetsu Tanaka

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- 11. Behavior Analysis for Human Support System**

Jun Kinugawa, Yuta Kawaai, Yusuke Sugahara, and Kazuhiro Kosuge

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- 12. Electrical and Mechanical Characteristics of Si Double-sided Neural Probe for In-vivo Recording**

Sanghoon Lee, Risato Kobayashi, Soichiro Kanno, Kangwook Lee,  
Takafumi Fukushima, Mitsumasa Koyanagi, and Tetsu Tanaka

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- 13. Advanced Haptic Sensor for Measuring Touch Feeling of Human Skin**

Daisuke Tsuchimi, Takeshi Okuyama, and Mami Tanaka

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- 14. In Vivo Single Molecular Imaging of Neogenesis Vasculature in Hemi Hind Limb Ischemic Mice.**

Y. Hamada, M. Takeda, K. Gonda, M. Hikage, Y. Hamanaka, T.Yambe, and N. Ohuchi

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- 15. In vivo Real-time Tracking of Polymeric Micelles for DDS Visualization**

Yohei Hamanaka, Kohsuke Gonda, Motohiro Takeda, Kouichi Shiraishi,  
Masayuki Yokoyama, and Noriaki Ohuchi

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- 16. Effect of Mechanical Circulatory Support on Pulse Transit Time**

Hongjian Liu, Yasuyuki Shiraishi, Xiumin Zhang, and Tomoyuki Yambe

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