

MONDAY, 10 DECEMBER

9:15-9:30 OPENING ADDRESS:

**On the Tohoku University 2007 Global COE Programme
Global Nano-Biomedical Engineering Education and Research Network Centre**

Takami Yamaguchi

(Professor, Graduate School of Engineering, Tohoku University, Leader, Tohoku University Global COE Program "Global Nano-Biomedical Engineering Education and Research Network Centre")

Functional Imaging

Chair: Prof. T.Yamaguchi

9:30-9:45 **Radio Frequency Signal Analysis of Intravascular Ultrasound Aiming to Tissue Characterization of Coronary Artery by using Self Organization Map**

Takahiro Iwamoto

(Department of Electrical and Communication Engineering, Graduate School of Engineering, Tohoku University)

9:45-10:00 **The Importance of Bioimaging Brain Activity During Exercise**

Arne Dietrich

(Associate Professor, Department of Social and Behavioral Sciences, American University of Beirut, Lebanon)

10:00-10:15 **Development of a New Positron Emission Mammography (PEM)**

Masayasu Miyake

(Division of Cyclotron Nuclear Medicine, Cyclotron and Radioisotope Center, Tohoku University)

10:15-10:30 **Effect of Time Resolution of Measurement on Ultrasonic-Measurement-Integrated Simulation of Three-Dimensional Unsteady Blood Flow in an Aneurysmal Aorta**

Kenichi Funamoto

(Institute of Fluid Science, Tohoku University)

10:30-10:45 BREAK

Plenary Lecture I

Chair: Prof. H. Fukuda

10:45-11:15 **Three-dimensional Imaging**

Colin J.R. Sheppard

(Professor, Division of Bioengineering, National University of Singapore)

Nanodevice and Artificial Organs

Chair: Prof. M. Raghunath

11:15-11:30 **Development of Fully Implantable Retinal Prosthesis Module**

Tetsu Tanaka

(Associate Professor, Department of Bioengineering and Robotics, Graduate School of Engineering, Tohoku University)

11:30-11:45 **Quantitative Immunocytochemistry (QICC) - Based Approach for Antifibrotic Drug Testing *In Vitro***

Zhibo Wang

(Tissue Modulation Laboratory, Division of Bioengineering, Faculty of Engineering, National University of Singapore)

- 11:45-12:00 **Long-term Biocompatibility of the Artificial Anal Sphincter in Animal Models**
Hongjian Liu
(Department of Medical Engineering and Cardiology, Institute of Development, Aging and Cancer, Tohoku University)
- 12:00-12:15 **Mechanical Integrative Design for Sophisticated Artificial Myocardial Contraction**
Yasuyuki Shiraishi
(Institute of Development, Aging and Cancer, Tohoku University)
- 12:15-13:15 LUNCH BREAK

Plenary Lecture II

Chair: Prof. C.T.Lim

- 13:15-13:45 **Structure and Function of Human Auditory System: Its High Sensitivity Is Achieved by Cochlear Amplification**
Hiroshi Wada
(Professor, Department of Bioengineering and Robotics, Graduate School of Engineering, Tohoku University)

Systems Approach to Nanomedicine

Chair: Prof. T.Tanaka

- 13:45-14:00 **Effect of Calcium Antagonist, Azelnidipine on the Baroreflex Sensitivity of the Heart and Artery**
Tomoyuki Yambe
(Professor, Department of Medical Engineering and Cardiology, Institute of Development, Aging and Cancer, Tohoku University)
- 14:00-14:15 **Gastric Slow Wave Heterogeneity: a Model study of Possible Causes**
Alberto Corrias
(Division of Bioengineering, National University of Singapore)
- 14:15-14:30 **Development of Respiration Measurement System with Conductive Rubber for Elderly Home Care**
Masahiko Okubo
(Department of Bioengineering and Robotics, Graduate School of Engineering, Tohoku University)
- 14:30-14:45 **Numerical Studies of Microbubbles' Interaction with Pulsed Ultrasound and Inverted Shockwave for Medical Applications**
S.W. Fong
(Institute of High Performance Computing, Singapore)
- 14:45-15:00 **Machine Interpretable Mathematical Model Descriptions**
David P Nickerson
(Division of Bioengineering, National University of Singapore)
- 15:00-15:15 **Linking Genotype to Phenotype through Multi-scale Models**
Martin L. Buist
(Division of Bioengineering, National University of Singapore)
- 15:15-15:30 BREAK

Plenary Lecture III

Chair: Prof. H. Wada

- 15:30-16:00 **Mechanical Insights into the Physiological Functions of Intercellular Adhesion Molecules**
Chwee Teck Lim
(Associate Professor, Division of Bioengineering, National University of Singapore)

Nanobiology

Chair: Prof. M.Takeda

- 16:00-16:15 **Nanotopography-induced Cell Regulation: A Role of Focal Adhesion Signaling**
Evelyn K.F. Yim
(Division of Bioengineering and Department of Surgery, National University of Singapore)
- 16:15-16:30 **Enhanced Adipogenic Differentiation of Mesenchymal Stem Cells (hMSCs) through the Application of the Excluded Volume Effect (EVE)**
Felicia Celeste Loe
(Tissue Modulation Laboratory, Division of Bioengineering, Faculty of Engineering, National University of Singapore)
- 16:30-16:45 **Biophysical Studies to Quantitate Excluded-Volume Effect for Enhanced *In Vitro* Matrix Deposition**
Karthik S. Harve
(Tissue Modulation Laboratory, Division of Bioengineering, Faculty of Engineering, National University of Singapore)
- 16:45-17:00 **Penetration Depth Extension via Focal Modulation**
C.H. Wong
(Department of Electrical and Computer Engineering, National University of Singapore)
- 17:00-17:15 **Nanoparticle-based Detection and Quantification of DNA with Single Nucleotide Polymorphism (SNP) Discrimination Selectivity**
Lin Yue Lanry Yung
(Department of Chemical and Biomolecular Engineering, National University of Singapore)
- 18:30-20:30 BANQUET

Lei Garden in CHIJMES
(http://ihs.microweb.com.hk/~design/leigarden/lg_shop_sg_en.html)
#01-24 Chijmes, 30 Victoria Street, Singapore 187996

TUESDAY, 11 DECEMBER

Plenary Lecture IV

Chair: Prof. T. Yambe

9:00-9:30 ***In Vivo* Single Molecular Imaging and Sentinel Node Navigation using Nano-biotechnology for Medical Application**

Motohiro Takeda

(Associate Professor, Department of Bioengineering and Robotics, Graduate School of Engineering, Tohoku University)

Nanotech in Oncology

Chair: Prof. M. Tashiro

9:30-9:45 **Micropipette Aspiration of Breast Cancer Cells**

Q.S. Li

(Department of Mechanical Engineering, National University of Singapore)

9:45-10:00 **Multifunctional Nanoparticles Decorated by Trastuzumab for Targeted Chemotherapy of Breast Cancer**

Bingfeng Sun

(Division of Bioengineering, National University of Singapore)

10:00-10:15 **Tumor Interstitial Nano-particle Delivery and Analysis in the Human Tumor Xenograft in Mice**

Masaaki Kawai

(Division of Surgical Oncology, Graduate School of Medicine, Tohoku University)

10:15-10:30 ***In Vivo* Tracking of Anti-cancer Drugs and Their Active Sites Conjugated with Quantum Dots**

Yohei Hamanaka

(Department of Surgical Oncology, Graduate School of Medicine, Tohoku University)

10:30-10:45 ***In Vivo* Distribution of Silver Iodide Beads in Cancerous Legions**

Yuu Sakurai

(Department of Surgical Oncology, Graduate School of Medicine, Tohoku University)

10:45-11:00 BREAK

Plenary Lecture V

Chair: Prof. James Goh

11:00-11:30 **Normal Brain Aging and its Risk Factors -Analysis of Brain MRI of Healthy Japanese Subjects**

Hiroshi Fukuda

(Professor, Department of Nuclear Medicine and Radiology, Institute of Development, Aging and Cancer, Tohoku University)

Nanoimaging

Chair: Prof. T. Hayase

11:30-11:45 **A Nano-bio-imaging Study to Evaluate Activity of P-glycoprotein, an Efflux Cellular Pump, in the Blood-brain Barrier of Living Human Brain Using Positron Emission Tomography**

Manabu Tashiro

(Associate Professor, Division of Cyclotron Nuclear Medicine, Cyclotron and Radioisotope Center, Tohoku University)

- 11:45-12:00 **Modified Substrates with Improved Surface-enhanced Raman Scattering (SERS) Performance for Biomedical Applications**
Clement Yuen
(Division of Bioengineering, Faculty of Engineering, National University of Singapore)
- 12:00-12:15 **Novel Heterodyne-Detection Polarization Coherent Anti-Stokes Raman Scattering Microscopy for High Contrast Molecule Imaging**
Fake Lu
(Department of Bioengineering, Faculty of Engineering, National University of Singapore)
- 12:15-12:30 **Design and Implementation of Novel Diffuse Optical Tomography System by using PRBS**
Weirong Mo
(Division of Bioengineering, National University of Singapore)
- 12:30-12:45 **The Scar-in-a-Jar: A Bioimaging Based Drug Discovery Tool for the Assessment of Antifibrotic Agents**
Clarice Z.C. Chen
(Graduate Programme in Bioengineering-NUS Graduate School for Integrative Sciences and Engineering, National University of Singapore)
- 12:45-13:00 **Blood Flow in Microchannel with Stenosis Measured by a Confocal Micro PTV System**
Hiroki Fujiwara
(Department of Bioengineering and Robotics, Graduate School of Engineering, Tohoku University)
- 13:00-14:00 LUNCH BREAK

Plenary Lecture VI

Chair: Prof. H. Fukuda

- 14:00-14:30 **Translocation and Health Effects of Gold Nanoparticles: A Systematic Investigation**
Choon-Nam Ong
(Professor, Toxicology Programme, Office of Life Sciences, National University of Singapore)

Nanomechanobiology

Chair: Prof. Siew-Lok Toh

- 14:30-14:45 **Polyelectrolyte-Complex Fibers for 3D Cell Patterning and Regenerative Medicine**
S.Z. Yow
(Graduate Program in Bioengineering, National University of Singapore)
- 14:45-15:00 **Biophysics Meets Tissue Engineering: Using Excluded Volume Effect to Enhance Connective Tissue Construction *In Vitro***
Yanxian Peng
(Division of Bioengineering, Faculty of Engineering, National University of Singapore)
- 15:00-15:15 **Morphological and Cytoskeletal Responses of Endothelial Cells to Local Tension Transmitted through Intercellular Junctions**
Yosuke Ueki
(Department of Bioengineering and Robotics, Graduate school of Engineering, Tohoku University)
- 15:15-15:30 **Enthalpy Measurement of Anion Binding to the Motor Protein Prestin by Isothermal Titration Calorimetry**
Koji Iida
(Department of Bioengineering and Robotics, Graduate School of Engineering, Tohoku University)

15:30-15:45 **Electrical Control of Gliding Direction of Kinesin-driven Microtubules**
Shukei Sugita
(Department of Bioengineering and Robotics, Graduate School of Engineering, Tohoku University)

15:45-16:00 **Basic Study of Microtubule Sorting by Length using Kinesin-Coated Microstructure**
Tatsuya Murase
(Department of Bioengineering and Robotics, Graduate School of Engineering, Tohoku University)

16:00-16:15 BREAK

Tissue Engineering
Chair: Prof. T. Matsumoto

16:15-16:30 **The Effects of Nanofibers Arrangement on BMSC Growth in a Hybrid Knitted Silk Scaffold System for Tendon/Ligament Tissue Engineering Applications**
Thomas K.H. Teh
(Division of Bioengineering, National University of Singapore)

16:30-16:45 **Enzyme Transglutaminase as a Biological Tissue Glue**
Pradeep Paul. P
(Division of Bioengineering, National University of Singapore)

16:45-17:00 **Mesenchymal Stem Cell Differentiation on Growth Factor Releasing Electrospun Nanofibers for Tendon/Ligament Tissue Engineering**
Sambit Sahoo
(Division of Bioengineering, National University of Singapore)

17:00-17:15 **Investigating the Role of Stem Cells in Multilineage Coculture for Ligament-bone Interface Tissue Engineering**
Bibhukalyan P. Nayak
(Division of Bioengineering, National University of Singapore)

17:15-17:30 **Biodegradable Smart Hydrogels for Drug Delivery and Tissue Engineering Applications**
Xian Jun Loh
(NUS Graduate School for Integrative Sciences & Engineering (NGS), National University of Singapore)

17:30-17:45 **Basic Fibroblast Growth Factor Delivery from Gelatin Microsphere Scaffold for *In Vitro* Angiogenesis**
Yen Wah Tong
(Department of Chemical & Biomolecular Engineering, National University of Singapore)

17:45-18:00 ADJOURNMENT