The 25th Hot Spring Harbor International Symposium

Cutting Edge of Technical Innovations in Structural and Systems Biology

Medical Institute of Bioregulation, Kyushu University

November 13-14, 2015

Collabostation I, Hospital Campus, Kyushu University, Fukuoka, JAPAN

Friday, November 13, 2015

13:50 – 14:00 Opening Remarks: **Hiroyuki Sasaki** (Director of Medical Institute of Bioregulation)

Session 1: Systems and Computational Biology Chair: **Yuji Sugita**

14:00 – 14:20 **Hiroyuki Kubota** (Kyushu University, Japan)
Transomics analysis of acute insulin action: network reconstruction from multi-omics data

14:20 – 14:40 **Kazuhiro Aoki** (Kyoto University)
Quantitative measurement of dissociation constant in living cell imaging

14:40 – 15:00 **Yuji Sugita** (Riken, Japan)
Free-energy calculations of conformational changes in membrane proteins by multi-resolution methods

15:00 – 15:40 James C. Gumbart (Georgia Institute of Technology, USA)
Bridging the gap between X-ray crystallography and biological insight with MD simulations

15:40 – 16:00 **Mikita Suyama** (Kyushu University, Japan)
Understanding genomic features from their structural aspects

16:00 – 16:20 Coffee Break

Session 2: Single-Molecule Techniques Chair: **Toshio Ando**

16:20 – 16:40 **Masahiro Shirakawa** (Kyoto University, Japan)
High-resolution imaging by using optically–detected magnetic resonance

16:40 – 17:00 **Rikiya Watanabe** (University of Tokyo, Japan)
Novel micro-device for highly sensitive analysis of membrane transporters

17:00 – 17:20 **Toshio Ando** (Kanazawa University, Japan)
Direct Visualization of Protein Molecules in Dynamic Action by High-speed Atomic Force Microscopy

17:20 – 18:00 Peter Hinterdorfer (Johannes Kepler University Linz, Austria)
Antibodies on the Video Screen: Bipedal Antibody Walking on Membranes observed with High-Speed AFM

19:00 – Dinner party (by invitation only)

Saturday, November 14, 2015

Session 3: Crystallography and NMR Chair: **Kosuke Morikawa**

10:00 – 10:20 **Tomoya Tsukazaki** (NAIST, Japan)
Structure of YidC reveals a mechanism of Sec-independent membrane protein insertion

10:20 – 10:40 **Daisuke Kohda** (Kyushu University)
Rational design of crystal contact-free space in protein crystals for analyzing main-chain dynamics of proteins

10:40 – 11:20 Ilme Schlichting (Max-Planck Institute, Germany)
Protein structure and dynamics studied with X-ray free-electron lasers

11:20 – 11:40 **Noritaka Nishida** (University of Tokyo, Japan)
In-cell NMR observation of the biological events within living cells

11:40 – 11:50 Group Photos

11:50 – 13:20 Lunch

Session 4: Short-talk Session for Young Researchers Chair: **Daisuke Kohda**
13:20 – 15:00 Short talks of 6 minutes each (See the next page for details)

15:00 – 15:20 Coffee Break

Session 5: Electron Microscopy Chair: **Kouta Mayanagi**

15:20 – 15:40 **Keisuke Ohta** (Kurume University, Japan)
Entire membrane organization of mitochondria and surrounding endoplasmic reticulum revealed by scanning electron microscope based three-dimensional reconstruction.

15:40 – 16:00 **Kouta Mayanagi** (Kyushu University, Japan)
Single particle analysis of DNA replication fork complex.

16:00 – 16:20 **Florence Tama** (Nagoya University, Japan)
Hybrid approaches to characterize structure and dynamics of biomolecular systems from single molecule experiments

16:20 – 17:00 Yifan Cheng (University of California, USA)
Structure of TRP channels by single particle cryo-EM, from blob-ology to atomic structures

17:00 – 17:10 Closing Remarks: **Kosuke Morikawa** (Kyoto University, Japan)

Session 4: Short-talk Session for Young Researchers Chair: **Daisuke Kohda**

Saturday, November 14, 2015

13:20 – 15:00 Short talks of 6 minutes each

Y-01: Hiroaki Ohishi (Epigenomics and Development)
DNA Methylation Dependent- and Independent-Regulation of Monoallelic Expression Maintained by Zfp57 in Ground-State Embryonic Stem Cells

Y-02: Hiroki Goto (Cancer Genetics)
Regulation of chondrogenesis and osteogenesis by Hippo pathway

Y-03: Chika Sakamoto (Molecular and Clinical Genetics)
Gene transfer of reprograming genes with newly developed non-transmissible measles virus vector into hematopoietic cells

Y-04: Tsunaki Higa (Molecular and Cellular Biology)
p57 maintains epithelial homeostasis via regulation of quiescent intestinal stem cells

Y-05: Yasuo Takashima (Organogenesis and Regeneration)
Lin28b-mediated microRNA regulation in mouse hepatoblasts

Y-06: Hirotada Tajiri (Immunogenetics)
DOCK1 as a novel molecular target for controlling cancer invasion and metastasis

Y-07: Nona Abolhassani (Neurofunctional Genomics)
Integrative analysis obtained from three different approaches demonstrates insulin signalling impairment associated with AEBP1 up-regulation in AD brains; The Hisayama Study

Y-08: Yuki Akieda (Cell Regulation Systems)
Zebrafish larval tissues possess an immune cell-independent defense system against cancer

Y-09: Kohei Yamada (Genomics)
Genetic Analysis for Benign Adult Familial Myoclonic Epilepsy using Linkage-Assisted Exome Sequencing.

Y-10: Yoshihiro Izumi (Metabolomics)
Next-generation metabolomics in the medical sciences

Y-11: Shinsuke Uda (Integrated Omics)
Estimation method of sparse partial correlation matrix for transomics network

Y-12: Yuki Kawasaki (Structural Biology)
Three-dimensional reconstruction of the AglB protein embedded in nanodiscs by negative staining electron microscopy

Y-13: Daisuke Saito (Bioinformatics)
Linkage disequilibrium analysis of allelic heterogeneity in DNA methylation

Y-14: Tesshin Murakami (Host Defense)
Two types of IL-17A-producing γδ T cells play critical roles in protection against pulmonary infection with *Klebsiella* pneumoniae in different activation manner

Y-15: Rieko Doi (Molecular Immunology)
Efficient adjuvanticity induced by a dual ligand for TLR and iNKT TCR

Y-16: Yuuta Imoto (Organelle Homeostasis)
Ultrastructure of Ring-shaped Supramolecular Nanomachinery for the Division of Peroxisome and Mitochondrion Revealed by EM-Based Single Organelle Analysis