

**RIMS Workshop : Theory of Biomathematics and its Applications XIV - Modelling and Analysis  
for Structured Population Dynamics and its Applications**

Date : Nov. 8 - 10, 2017

Venue : Maskawa Hall, North Comprehensive Education and Research Bldg., Kyoto University

Organizing committee : Hiroto Shoji (School of Science and Technology, Kwansai Gakuin University)

Toshikazu Kuniya (Graduate School of System Informatics, Kobe University)

Endorsement The Japanese Society for Mathematical Biology

**Program**

Nov. 8 th (Wed)

13:30~13:35 Opening Address

**Mini-Lecture**

13:35~14:10 Gen Kurosawa (Theoretical Biology Laboratory, RIKEN and iTHEMS, RIKEN)

Toward the simplest theoretical model for circadian rhythms

14:10~14:15 Short break

**Contributed Talk**

14:15~14:35 Kazuhisa Nishi (School of Engineering, University of Hyogo)

Theory of genes network in reprogramming of iPS cells

14:35~14:55 Machika Higashibeppu (Faculty of Science, Kyushu University)

Predicting bone mass dynamics under various gravity conditions

14:55~15:00 Short Break

15:00~15:20 Mitsuo Takase (LINFOPS Inc.)

Tumor-immune system analysis code situation, relationship with real states and its automatic control

15:20~15:40 Tsuyoshi Hirashima, Naoya Hino, Michiyuki Matsuda (Graduate School of Medicine, Kyoto University)

Cellular Potts Modeling for Mechanical Wave Propagation in Multicellular Movement

15:40~16:00 Nariyuki Nakagiri (School of Human Science and Environment, University of Hyogo)

Simulation and pattern formation for *Bacillus subtilis* natto on the lattice model : effects of environmental conditions

16:00~16:10 Short Break

**Mini-Lecture**

16:10~16:45 Sohei Tasaki (Frontier Research Institute for Interdisciplinary Sciences, Tohoku University)

Morphologies of *Bacillus subtilis* communities responding to environmental variation

Nov. 9 th (Thu)

**Contributed Talk**

9:00~9:20 Shinji Nakaoka (JST PRESTO, The University of Tokyo)

Analysis for composition change of the gut microbiota induced by viral infection

9:20~9:40 Kai Mizuta, Hisashi Inaba (Graduate School of Mathematical Sciences, the University of Tokyo)

Homogeneous eigenvalue problem and its applications

9:40~10:00 Kazunori Sato (Faculty of Engineering, Shizuoka University)

Basic reproduction numbers for epidemic models on lattice space

10:00~10:10 Short Break

**Mini-Symposium “Mathematical models in epidemiology – the current of young research in Japan”**

Organizer Toshikazu Kuniya (Graduate School of System Informatics, Kobe University)

10:10~10:15 Opening Address

10:15~10:55 Ryosuke Omori (Research Center for Zoonosis Control, Hokkaido University)

Lessons from multi-strain SIR model and their application for prediction of Influenza epidemics

10:55~11:00 Short Break

11:00~11:40 Yukihiro Nakata (Shimane University)

Infection and reinfection dynamics in a heterogeneous susceptible population

11:40~11:45 Short Break

11:45~12:25 Youich Enatsu (Department of Applied Mathematics, Tokyo University of Science)

Transmission dynamics of mathematical models for vector-borne diseases

12:25~13:30 Break for Lunch

**Invited Talk**

13:30~14:30 Viggo Andreasen (Roskilde University, Denmark)

The dynamics of repeated epidemics

14:30~14:40 Short Break

**Invited Talk**

14:40~15:40 David Greenhalgh (University of Strathclyde, UK)

Backward bifurcation, equilibrium and stability phenomena in a three-stage extended BRSV epidemic model

15:40~15:50 Short Break

**Invited Talk**

15:50~16:50 Hisashi Inaba (Graduate School of Mathematical Sciences, the University of Tokyo)

An Age-Structured Epidemic Model for Demographic Transition

Nov 10 th (Fri)

**Contributed Talk**

- 9:50~10:10 Yusuke Ito (Department of Biology, Kyushu University), Fabrizio Mammano (INSERM, France), Shingo Iwami (Department of Biology, Kyushu University, PRESTO JST, CREST JST)  
Identifying the number of target cell subpopulation in HIV-1 co-infection
- 10:10~10:30 Shingo Iwami (Kyushu University & JST PRESTO,)  
Mathematical modeling of virus dynamics and its application to data analysis
- 10:30~10:50 Yusuke Kakizoe (Graduate School of Systems Life Sciences, Kyushu University)  
Quantification of Hepatitis B Virus infection dynamics in cell culture model
- 10:50~11:00 Short Break
- 11:00~11:20 Kosaku Kitagawa (Graduate School of Systems Life Sciences, Kyushu University)  
Analyzing clinical data of Direct-Acting-Antivirals treatment for Hepatitis C Virus patients
- 11:20~11:40 Tatsuya Kurusu (Department of Biology, Faculty of Sciences, Kyushu University)  
Quantitative analysis of APOBEC to HIV-1 infection in vivo with linear mixed effects model
- 11:40~12:00 Shoya Iwanami (Graduate School of Systems Life Sciences, Kyushu University)  
Data analysis of single-cell transplantation using mathematical model of hematopoietic system with myeloid bypass
- 12:00~13:00 Break for Lunch
- 13:00~13:20 Akane Hara (Graduate School of Systems Life Sciences, Kyushu University) , Yoh Iwasa (Department of Biology, Faculty of Sciences, Kyushu University)  
Theoretical study of relationship between allergy and intestinal microbiome
- 13:20~13:40 Mitsuaki Takaki (Faculty of Science, Kyushu University)  
Mathematical modeling of cancer recurrence caused by premalignant lesions formed before the first treatment
- 13:40~14:00 Hiroataka Kanazawa (Kyoto Prefectural University of Medicine, International Institute of Advanced Studies)  
A relationship between differential energy and algebra in Morphogenesis
- 14:00~14:10 Short Break
- 14:10~14:30 Ryo Iwamoto (School of Science and Technology, Kwansai Gakuin Univ.)  
Turing Patterns by Anisotropic Diffusions
- 14:30~14:50 Sho Shimbaba (School of Fundamental Science and Technology, Waseda University)  
Insurance developed by Social Wasps
- 14:50~15:00 Short Break

15:00~15:20 Kanako Noda, Kenta Uemichi (Kwansei Gakuin University), Etsushi Nakaguchi (Tokyo Medical and Dental University), Koichi Osaki (Kwansei Gakuin University)

A Lyapunov Function for Constant Equilibria to the Deneubourg Chemotaxis System

15:20~15:40 Takaaki Aoki, Koichi Osaki (School of Science and Technology, Kwansei Gakuin Univ.)

Codimension-two and -three bifurcations from uniform equilibria in a chemotaxis-growth system

15:40~16:00 Ryusuke Kon (Faculty of Engineering, University of Miyazaki)

Dynamic dichotomy in high-dimensional semelparous Leslie matrix models

16:00~16:05 Closing Address