

# Theory of Biomathematics and Its Applications IX

November 13 (Tue.) -- 16 (Fri.), 2012

Research Institute for Mathematical Sciences (Room No. 420),

Chair: Kazunori SATO (Shizuoka University)

Academic Partner: The Japanese Society for Mathematical Biology

## Program

### November 13 (Tue.)

13:00 Opening Address

#### Contributed Talks:

13:10--13:30 Hikaru Yoshida (Shizuoka Univ.)

H5N1 epidemics: Is vaccination and prevention policy effective?

13:35--13:55 Hiroki Kawase (Shizuoka Univ.)

Apoptosis model in HIV infection

14:00--14:20 Kenta Saiki (Shizuoka Univ.)

Dendritic cells activation model in HIV infection

14:25--14:45 Hisashi Inaba (Univ. of Tokyo)

On the pandemic threshold theorem of the early Kermack-McKendrick model with individual heterogeneity

<< short break >>

15:05--15:25 Chaifong Noppharat (Chuo Univ.)

Dynamical model of virus replication by 2 type influenza in human epithelial cells

15:30--15:50 Yueping Dong (Shizuoka Univ.)

Mathematical modeling on the role of helper T cells in tumor immune system

15:55--16:15 Shinji Nakaoka (RIKEN RCAI)

Mathematical study on the initiation of skin inflammatory responses

16:20--16:40 Megumi Masuda<sup>1</sup>, Akira Sasaki<sup>2</sup> and Kei Tokita<sup>1</sup> (<sup>1</sup>Osaka Univ., <sup>2</sup>SOKENDAI)

A mathematical model of molecular mimicry and autoimmune disease

## **November 14 (Wed.)**

### **Contributed Talks:**

9:30-- 9:50 Yuki Goshima (Univ. of Tokyo)

A Mathematical model for cancer stem cell, considering staying time in proliferating and quiescent phase

9:55--10:15 Kouji Harada (Toyohashi Univ. of Technology)

A Self-Destruction Dynamics of HIV-1 Quasispecies Population through Actions of a Mutagen

10:20--10:40 Tsuyoshi Hirashima (Kyoto Univ.)

Cellular Potts modeling on collective cell movement with experimental observation using skin cell

10:45--11:05 Narumi Ikuta, Tsuyoshi Mizuguchi (Osaka Pref. Univ.)

Inheriting process on a family tree network

11:10--11:30 Makoto Yomosa<sup>1</sup>, Tsuyoshi Mizuguchi<sup>1</sup>, Yoshinori Hayakawa<sup>2</sup> (<sup>1</sup>Osaka Pref. Univ., <sup>2</sup>Tohoku Univ.)

Structure analysis of hooded gull flocks based on a leader-follower relationship

11:30--13:00 <<Break for Lunch>>

13:00--15:15

### **Mini-Symposium "Lyapunov's method and its application"**

Organizer: Tsuyoshi Kajiwara (Okayama Univ.)

Symposiasts:

Tsuyoshi Kajiwara (Okayama Univ.)

Toru Sasaki (Okayama Univ.)

Yoichi Enatsu (Waseda Univ.)

Toshikazu Kuniya (Univ. of Tokyo)

### **Contributed Talks:**

15:30--15:50 Lisa Uechi (Kyoto Univ.)

Stability and restoration phenomena in competitive systems

15:55--16:15 Yusuke Ikegawa (Osaka Pref. Univ.)

Effects of two types of adaptive defense by basal resource on IGP system

16:20--16:40 Ryo Yamaguchi (Kyushu Univ.)

Evolution of premating barriers in interspecific contacts: quantitative genetic modeling

## **November 15 (Thur.)**

### **Contributed Talks:**

9:15-- 9:35 Takuyo Aita (Saitama Univ.)

An interpretation of evolutionary dynamics in *in vitro* molecular evolution from thermodynamical and informational view point

9:40--10:00 Hiromi Seno (Tohoku Univ.)

A simple mathematical model for the annual variation of epidemic outbreak with prevention level affected by past incidence sizes

### **Invited Talk**

10:15--11:15 Nanako Shigesada (PRESTO Japan Science and Technology Agency)

Travelling waves of biological invasions in spatially heterogeneous media: effects of diffusion, advection and population pressure

11:15--12:45 <<Break for Lunch>>

12:45--16:15

### **Mini-Symposium "Spatial structure in ecology"**

Organizer: Kazunori Sato (Shizuoka Univ.)

Symposiasts:

Toshiyuki Namba (Osaka Pref. Univ.)

Ichiro Ken Shimatani (Inst. of Statist. Math.)

Kei Tokita (Osaka Univ.)

Satoru Morita (Shizuoka Univ.)

Hiroshi Hakoyama (Fish. Res. Agency)

Akiko Satake (Hokkaido Univ.)

### **Contributed Talk:**

16:30--16:50 Mitsuo Takase (LINFOPS Inc.)

A automatic control mechanism to ignite the immune system locally against a small cancer mass considering reliability

## **November 16 (Fri.)**

### **Contributed Talks:**

9:30-- 9:50 Etsushi Nakaguchi (Tokyo Medical and Dental Univ.)

Distinct particles model of layer process of fibre molecules

9:55--10:15 Isamu Doku (Saitama Univ.)

Finite time extinction of stochastic model for tumour immunity

10:20--10:40 Yasumasa Saisho<sup>1</sup>, Atsushi Ito<sup>2</sup> (<sup>1</sup>Hiroshima Univ., <sup>2</sup>Tokai Univ.)

Stochastic models of the generation of DNA double-strand breaks

10:45--11:05 Shu-ichi Kinoshita, Keita Tateishi, Mayuko Iwamoto, Nobuhiko J.

Suematsu, Daishin Ueyama (MIMS)

Spiral formation in heterogeneous discretized excitable media

11:10--11:30 Mayuko Iwamoto, Daishin Ueyama, Ryo Kobayashi (Meiji Univ.)

The mechanism of crawling locomotion using mucus in gastropod

11:30--13:00 <<Break for Lunch>>

### **Contributed Talks:**

13:00--13:20 Masamichi Sato (Univ. of Tokyo)

Metabolic Flux and Convex Polytope

13:25--13:45 Takeshi Otsu (Shizuoka Univ.)

A simple age structure model in yeast population

13:50--14:10 Nariyuki Nakagiri (Univ. of Hyogo)

Relation between species extinction and space structure of the habitat on the square lattice:

Habitat fragmentation by the habitat destruction

14:15--14:35 Kenta Yashima<sup>1</sup>, Sayaki U. Suzuki<sup>2</sup>, Akira Sasaki<sup>3</sup> (<sup>1</sup>MIMS, <sup>2</sup>NARC, <sup>3</sup>SOKENDAI)

Application of Fractal reaction theory to population dynamics in heterogeneous environment -  
calculation of basic reproduction ratio -