ASHBi DISTINGUISHED SEMINAR

DSGRN: an efficient tool for understanding regulatory networks

Lecturer: **Dr. Konstantin Mischaikow**

Professor, Department of Mathematics
Rutgers University, The State University of New Jersey

Date: Monday, 28th October 2019
Time: 17:00–18:00
Venue: Seminar room 103
Faculty of Medicine Bldg. A

Based on a novel mathematical approach to dynamics, DSGRN is software that takes as input a regulatory network and outputs a database that provides for any parameter value a coarse description of the global dynamics.

The purpose of this talk is to explain why DSGRN is a potentially powerful tool for dealing with problems in systems biology. To do this we will present several examples including a network involving the tumor suppressor p53, and the Rb-E2F system that is responsible for the restriction point dynamics in mammalian cells.

In the first example, we will indicate that DSGRN can quickly analyze the network of interest and that simple queries can identify conditions on the system that permit oscillations.

In the second example, we will show that DSGRN can be used to quantify how well a network can carry out a particular function, in this case acting as a robust switch. This is a nontrivial task since it involves understanding the behavior of the system under a variety of conditions, where almost by definition the system cannot have a unique behavior at each condition. We will also show how this quantification can be used to preferably identify potential simplified models for the RB-E2F system.

Organizer: Prof. Yasuaki Hiraoka
[E-mail] hiraoka.yasuaki.6z@kyoto-u.ac.jp
[Tel] 075-753-9875
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