

LECTURE SERIES & WORKSHOPS

TRANSLATIONAL BIOINFORMATICS AND SYSTEMS BIOMEDICINE

19

JUNE 2017

Monday

LECTURE

University of
Luxembourg (LCSB)
House of Biomedicine II
Ground Floor, Room 15

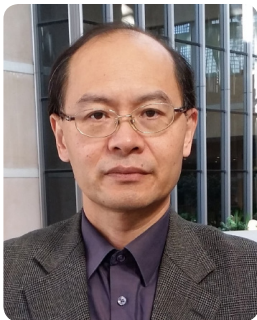
MEET THE SPEAKER*

Light snacks provided
University of
Luxembourg (LCSB)
House of Biomedicine II
Ground Floor, Room 15

4.00 - 5.00 pm

5.00 - 6.30 pm

*Please register by sending a mail to
florence.henry@lih.lu



SPEAKER

Prof Luonan CHEN

Director, Key Laboratory of Systems
Biology, Shanghai Institutes for Biological
Sciences, Chinese Academy of Sciences

HOST:

Department of Infection
and Immunity

RESPONSIBLE LIH SCIENTIST:

Dr Feng HE
(feng.he@lih.lu)

HUNT FOR THE TIPPING POINTS OF DISEASES BY DYNAMIC NETWORK BIOMARKERS

ABSTRACT

Considerable evidence suggests that during the progression of complex diseases, the deteriorations are not necessarily smooth but are abrupt, and may cause a critical transition from one state to another at a tipping point. Here, we develop a model-free method to detect early-warning signals of such critical transitions, even with only a small number of samples. Specifically, we theoretically derive an index based on a dynamical network biomarker (DNB) that serves as a general early-warning signal indicating an imminent bifurcation or sudden deterioration before the critical transition occurs. Based on theoretical

analyses, we show that predicting a sudden transition from small samples is achievable provided that there are a large number of measurements for each sample, e.g., high-throughput data. We employ RNA-seq and microarray data of three diseases (cancers) to demonstrate the effectiveness of our method. The relevance of DNBs with the diseases was also validated by related experimental data and functional analysis.

For more information, please visit our website:

www.sibcb.ac.cn/ePI.asp?id=163

www.lih.lu

Supported by: