数学与系统科学研究院

计算数学所学术报告

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报告题目：

Emerging Behaviors in Immunology

邀请人：　卢本卓 研究员

报告时间：**2018 年 10 月 24 日（周三）**

上午 10:00-11:00

报告地点：　数学院南楼六层

602 教室

Abstract：

Emerging phenomena are commonly existing in complex systems. They have been puzzling the inquisitive souls since the dawns of our civilization. As of today, academic interests on the emergence have spread across multiple disciplines. In immunology, emerging behaviors underspin our molecular defense mechanisms again pathogen invasions. It thus incentivizes the pursuit of a mathematical description of emergence which alludes clues to coevolution. I would like enthusiastically present this subject in the backdrop of humoral immunity in response to influenza viruses.

Influenza is a RNA virus that is associated with significant seasonal morbidity and mortality. Vaccinization is by far the most effecitve medical intervention to   prevent the disease. However, being ranked on the top of the mutation rate in the virus family, influenza frequently escape the human immunity surveillance, leading to the failure of vaccine treatment and possibly pandemic outbreaks.

To assess the strength of immune response to viruses for the purpose of vaccine development, hemagglutination assay has been widely. The course of the assay progression examplifies an emerging process. The conventional experimental approach was built on a one virus to one antiserum reaction system. Such a system has severe drawbacks on its limited value in reflecting biological reality and high labor/economic cost. A new approach was proposed to expand the system to a multiple viruses to one antiserum scenario. If successful, this new assay design will revolutionize the virology/immunology field. My current research is involved in simulating this new proposed system mathematically. I will discuss the current progress of the project with the hope to stir some interesting discussions.

欢迎大家参加！