國立中山大學應用數學系

學術演講

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講　題：Mathematical studies on viral dynamics

時　間：2022/04/14（Thursday）14:10 ~ 15:00

地　點：理 SC 4009-1 室

茶　會：13:30

Abstract

In this talk, I will present my recent studies on viral dynamics from the viewpoint of within-host infection. There are three important features in this research field: the time delay due to chemical reactions, spatial heterogeneity because of the complexity of a human body, and the periodic drug efficacy under a treatment. I will start from a basic HIV model and introduce my reports by incorporating these features step by step. The final model will be a reaction-diffusion equation with periodic coefficients, by which I can explore the viral dynamics within a treated host by incorporating the spatial heterogeneity with the intrinsic incubation period of the actively infected cells and virions. Overuse of a drug can lead to deleterious side effects, and overestimating the efficacy of a drug can result in failure to treat infection. Therefore, it is crucial to determine the threshold dynamics of either extinction of virus or the uniform persistence of infection, by calculating the value of the basic reproduction number (Ro). I will also introduce numerical simulations to explore the effects of various parameters on the value of Ro. The main issues include how the value of Ro affected by the incubation period, the mobility of infected cells or virions, and the spatial fragmentation of the virus environment.

敬 請 公 告！ 歡 迎 參 加！

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