

Colloquium

Dr. Yun Tian

**Thursday, December 4, 2014
11:00am-12:00pm, HH 3026**

Dynamics of HIV virotherapy with nonlinear incidence and delays in cell infection and virus production

Abstract: In this talk, we propose a mathematical model for HIV infection with delays in cell infection and virus production. The model examines a viral-therapy for controlling infections through recombining HIV virus with a genetically modified virus. The basic reproduction number R_0 is identified and its threshold properties are discussed. When $R_0 < 1$, the infection-free equilibrium E_0 is globally asymptotically stable. If $1 < R_0 < R_1$, where R_1 is a positive constant depending on the model parameters, the single-infection equilibrium E_s is globally asymptotically stable. When $R_0 > R_1$, there is a double-infection equilibrium E_d , and there exists a constant R_2 such that E_d is asymptotically stable if $R_1 < R_0 < R_2$. We give an example to determine the largest range of R_0 for the local stability of E_d and existence of Hopf bifurcation. Some simulations are performed to support the theoretical results. This is a jointed work with Dr. Yuan Yuan.