

THE DEPARTMENT OF MATHEMATICAL SCIENCES

Indiana University - Purdue University Fort Wayne

is pleased to present

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Competitive Exclusion and Coexistence in a Two-Strain Pathogen Model with Diffusion

Abstract

We consider a two-strain pathogen model described by a system of reaction-diffusion equations. We define a basic reproduction number R_0 and show that when the model parameters are constant (spatially homogeneous), if $R_0 > 1$ then one strain will outcompete the other strain and drive it to extinction, but if $R_0 \leq 1$ then the disease-free equilibrium is globally attractive. When we assume that the diffusion rates are equal while the transmission and recovery rates are heterogeneous, then there are two possible outcomes under the condition $R_0 > 1$: 1) Competitive exclusion where one strain dies out. 2) Coexistence between the two strains. Thus, spatial heterogeneity promotes coexistence.

Noon – 1:00, Monday, April 18, 2016. Location: KT 216

<http://ipfw.edu/departments/coas/depts/math/news/seminars.html>