NIMBioS
National Institute for Mathematical and Biological Synthesis

NIMBioS Interdisciplinary Seminar

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3:30 p.m.*, November 22, 2011
NIMBioS, Blount Hall, 1534 White Ave, 4th floor

"Backward bifurcation and periodic oscillations in model for the dymamics of malaria transmission"

A deterministic ordinary differential equation model for the dynamics of malaria transmission that explicitly integrates the demography of the malaria vector and its interaction with the human population is developed and analyzed. The model is different from standard malaria transmission models in that the vectors involved in disease transmission are those that are questing for human blood. Model results indicate the existence of nontrivial disease-free and endemic steady state solutions, which can be driven to instability via a Hopf bifurcation as a parameter is varied in parameter space. Our model therefore captures oscillations that are known to exist in the dynamics of malaria transmission without recourse to external seasonal forcing. Additionally, our model exhibits the phenomenon of backward bifurcation. Two threshold parameters that can be used for purposes of control are identified and studied. Possible reasons why it has been difficult to eradicate malaria are also advanced.

**Join us for refreshments in the NIMBioS Lobby on the 4th floor at 3 p.m.*

For more information about this and other NIMBioS Seminars, visit
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The National Institute for Mathematical and Biological Synthesis (NIMBioS) brings together researchers from around the world to collaborate across disciplinary boundaries to investigate solutions to basic and applied problems in the life sciences. NIMBioS is sponsored by the National Science Foundation, the U.S. Department of Homeland Security, and the U.S. Department of Agriculture with additional support from The University of Tennessee, Knoxville.

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