Jun 1st, 12:00 PM - 12:30 PM

A mathematical model of the immune system response to Leishmania parasite

Ephraim Agyingi
Rochester Institute of Technology, eoasma@rit.edu

Follow this and additional works at: https://scholarscompass.vcu.edu/bamm
Part of the Life Sciences Commons, Medicine and Health Sciences Commons, and the Physical Sciences and Mathematics Commons

https://scholarscompass.vcu.edu/bamm/2018/friday/15

This Event is brought to you for free and open access by the Dept. of Mathematics and Applied Mathematics at VCU Scholars Compass. It has been accepted for inclusion in Biology and Medicine Through Mathematics Conference by an authorized administrator of VCU Scholars Compass. For more information, please contact libcompass@vcu.edu.
Macrophages are an important component of the immune system, activated in response to infection and are drivers of inflammation. However, *Leishmania* parasites have developed pathways that render macrophages harmless, turning them into shelters from the rest of the immune response. The parasite then grows intracellularly in host macrophages. We present a basic model of the immune response to infection and use it to study the effect that genes have on disease progression for leishmaniasis. The model is formulated as a system of differential equations. Numerical simulations of the model demonstrating bifurcation for knock-out genes in murine infections are provided. Further analysis of the model is also provided.