

1155-92-162

**Baoling Ma\*** (baoling.ma@millersville.edu), **Chuan Li** and **Jack Warner**. *Structured mathematical models to investigate the interactions between malaria parasites and host immune response.*

Malaria infection has posed a major health threat for hundreds of years in human history. Yet, due to the complex interactions between a host immune response and the parasite, few mathematical models exist to study its dynamics. In this talk, a system of structured partial differential equations are established to account for the dependence of red blood cell infectivity on maturation level. These equations are coupled with another set of differential equations for investigating the population dynamics of Plasmodium falciparum and its interaction with red blood cells and cells of the immune system. A finite difference scheme is developed to solve the system. Numerical simulations are applied to investigate the interplay between the host immune response and the parasite dynamics. The disease dynamics in acute infection is also investigated. (Received January 10, 2020)