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**Ryan Nikin-Beers\*** (rnikinbeers@ufl.edu), **Julie Blackwood**, **Lauren Childs** and **Stanca Ciupe**. *Unraveling within-host signatures of dengue infection at the population level*.

Dengue virus causes worldwide concern with nearly 100 million infected cases reported annually. The within-host dynamics differ between primary and secondary infections, where secondary infections with a different virus serotype typically induce more severe disease. We build upon the variable within-host viral dynamics during infections resulting in mild dengue fever and severe dengue hemorrhagic fever. We couple these within-host viral dynamics to a population-level model through a system of partial differential equations. The resulting multiscale model examines the dynamics of between-host infections in the presence of two circulating virus strains. We determine thresholds of disease persistence analytically, while simulating the population dynamics numerically.

Using a similar numerical scheme, we develop and analyze a multiscale model which includes four virus strains. We focus on how the viral dynamics affect both the rate of transmissibility of infection and the rate of susceptibility to infection. We also determine how the viral dynamics contribute to the difference between disease stability and oscillatory behavior at the population level. (Received January 21, 2020)