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Stanca M Ciupe* (stanca@vt.edu), Blacksburg, VA 24060, and **Jonathan Forde**. *Bi-stable behavior can explain the differences in disease outcome following SIV infections in rhesus macaques*. Preliminary report.

Experimental studies have shown that the size of viral inoculum from acute and chronic SIV infections correlates with disease outcomes. It is not known if the observed outcomes depend on the site of the infection, immune responses at the site, inoculum size and characteristics (in particular the presence of non-infectious particles), change in virus infectivity, and/or the genetic characteristics of the infected animals. In this study, we developed a model of antibody responses to SIV infection in rhesus macaques that accounts for virus-antibody immune complexes formation. Our model exhibits bi-stable dynamics between clearance and chronic states. Using temporal virus data and known inoculum values, we fitted the model and determined the avidity rate and antibody's carrying capacity that can explain the transition between virus clearance and persistence when initial conditions vary. We used these results to make predictions regarding the minimum amount of virus needed for infection in the presence and absence of a protective antibody response. (Received January 13, 2015)