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Jonathan L Mitchell* (jmittchell@smu.edu), 9821 Summerwood Circle #1502, Dallas, TX 75243. *Synchronous versus Asynchronous Oscillations for an Antigenically Varying Plasmodium falciparum Infection with Host Immune Response*. Preliminary report.

We consider a deterministic intrahost model for *Plasmodium falciparum* (*Pf*) Malaria Infection which accounts for antigenic variation between n clonal variants and corresponding host immune effectors. Specifically, the model separates the immune response into two components, specific and cross-reactive, respectively, in order to demonstrate that the latter can be a mechanism for the sequential appearance of variants observed in actual *Pf* infections. We show that this sequential dominance lengthens infection time and is, thus, considered a survival strategy for the parasite. We also incorporate a constant delay or time lag in the stimulation of immune response which represents the time between changes in the *Pf* population and production of immune effectors. We find two possible critical delay times which lead to an Hopf bifurcation, one for persistent synchronized oscillations while the other for persistent antiphase oscillations. Conditions for which case occurs “first” are given along with bifurcation behavior near the critical values. (Received September 21, 2009)