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**Cameron J Browne\*** ([cambrowne@louisiana.edu](mailto:cambrowne@louisiana.edu)), Mathematics Department, University of Louisiana at Lafayette, P.O. Box 43568, Lafayette, LA 70504. *Modeling Multi-Epitope HIV/CTL Immune Response Dynamics and Evolution.*

The CTL (Cytotoxic T Lymphocyte) immune response plays a large role in controlling HIV infection. CTL immune effectors recognize epitopes (viral proteins) presented on the surface of infected cells to mediate their killing. The immune system has an extensive repertoire of CTLs, however HIV can evolve resistance to attack at different epitopes. The ensuing arms race creates an evolving network of viral strains and CTL populations with variable levels of cross-reactivity (epitopes shared between virus strains). Motivated by this, we formulate a general ODE model of multi-epitope virus-immune response dynamics. Some special cases for the HIV/CTL interaction network are considered. We characterize the persistent viral strains and immune response in terms of system parameters, along with obtaining stability and uniform persistence results via Lyapunov functions. The results are interpreted in the context of within-host HIV/CTL evolution and numerical simulations are provided. To conclude, we discuss extensions of the model to a PDE system which incorporates cell-infection age structure. (Received September 11, 2016)