1116-92-709 **Areej M. Alshorman*** (amalshor@oakland.edu), Department of Mathematics and Statistics, Oakland University, Rochester, MI 48309, and **Chathuri Samarasinghe**, **Wenlian Lu** and **Libin Rong**. *An HIV model with age-structured latently infected cells.*

Highly active antiretroviral therapy can suppress viral load in many HIV-infected patients to below the detection limit of standard assays but cannot eradicate the virus because of the existence of pro-virus residing in latently infected $CD4^+$ T cells. The activation rate of latently infected cells depends on the age of latent infection. In this work, we develop a model of HIV infection including age-structured latently infected cells. We mathematically analyze the model and use numerical simulation to show that the model can explain the persistence of low-level viremia and the latent reservoir stability in patients on therapy. Sensitivity tests suggest that the model is robust to the change of most parameters but is sensitive to the relative magnitude of the net generation rate and the long-term activation rate of latently infected cells. To reduce the sensitivity, we extend the model to include homeostatic proliferation of latently infected cells. The new model is robust in reproducing the long-term dynamics of the virus and latently infected cells observed in patients receiving prolonged therapy. This work provides a modeling framework that can be used to evaluate treatment strategies targeting functional cure for HIV without continuous and lifetime therapy. (Received September 10, 2015)