1155-92-469 **Jessica M Conway*** (jmconway@psu.edu), Department of Mathematics, Pennsylvania State University, University Park, PA 16802. *Stochastic time-inhomogeneous HIV dynamics following treatment interruption.*

Antiretroviral therapy (ART) effectively controls HIV infection, suppressing HIV viral loads. Typically suspension of therapy is rapidly followed by rebound of viral loads to high, pre-therapy levels. However, recent studies suggest that approximately 10% of study participants undergoing ART treatment interruption show viral rebound only months or years after interruption, while some may be controlling infection permanently. We will first define what we mean by viral rebound and describe model-supported hypotheses of HIV viral rebound and control. We will then discuss our branching process model to gain broad insight into these post-treatment dynamics. Specifically we provide theory that explains both short- and long-term viral rebounds, and post-treatment control, via a branching process with time-inhomogeneous rates, validated with data from Li et al. (2016). We will discuss the associated biological interpretation and implications. Finally, treatment interruption clinical trials are used to test efficacy of drug or other interventions to delay or prevent viral rebound; we will discuss how our modeling can be used to guide and inform such clinical trials. (Received January 20, 2020)