1163-92-1021 **Hayriye Gulbudak**, **Paul L. Salceanu** and **Gail S.K. Wolkowicz*** (wolkowic@mcmaster.ca), Department of Mathematics and Statistics, 1280 Main Street West, Hamilton, Ontario L8S 4K1, Canada. *A delay model for persistent viral infections in replicating cells.*

Persistently infecting viruses remain within infected cells for a prolonged period of time without killing the cells and can reproduce via budding virus particles or passing on to daughter cells after division. The ability for populations of infected cells to be long-lived and replicate viral progeny through cell division may be critical for virus survival in examples such as HIV latent reservoirs, tumor oncolytic virotherapy, and non-virulent phages in microbial hosts. A model for persistent viral infection within a replicating cell population, time delay and eclipse stage prior to infected cell replication are considered. Reproduction numbers providing existence and stability of the equilibria of the system, along with identifying the emergence of several bifurcations, including backward, Hopf, and Bogdanov-Takens bifurcations are discussed. We investigate the possibility of long-term survival of the infection (represented by chronically infected cells and free virus) in the cell population by utilizing the mathematical concept of robust uniform persistence. Using the Matlab toolbox, DDE-Biftool, with the estimated parameter values for phage-microbe systems, we show regimes of complex bifurcation dynamics and address how considering delay can affect outcomes. (Received September 14, 2020)