INVESTIGATION OF MAMMALIAN IFITM3 GENES AS VIRAL RESTRICTION FACTORS OF HSV-1 INFECTION.

Hayden Klaus[1], Dane Bowder[1], hayden.klaus@doane.edu
1 - Department of Biology, Doane University, Crete NE;

Herpes Simplex Virus type one (HSV-1) infections are some of the most common viral infections of humans in the world. HSV-1 is an enveloped virus which establishes latency in its host as a way to evade the host's immune system. During viral infections host cells express viral restriction factors to halt infection to other cells. Cells express interferon in response to viruses and as a result increase expression of viral restriction factors, one such group of restriction factors is known as interferon-induced transmembrane (IFITM) family of proteins . Many stages of the viral replication cycle are inhibited by viral restriction factors; IFITM3 is thought to modulate cell membranes or antagonize viral structure and inhibit entry. IFITM3 specifically has been linked to potently restrict enveloped viruses like Human Immunodeficiency Virus and Influenza. Both human IFITM1 and IFTIM3 have been shown to strongly inhibit HSV-1 infection in vitro. Previous studies have shown that non-primate mammalian genes have significantly inhibited HIV and SIV infections which is the basis of our experiments on the inhibition of HSV-1. Initial experiments have shown that overexpression of IFITM3 did not have a significant impact on plaque size but we found that rates of expression were low. To circumvent this we explored alternative transfection methods resulting in a higher yield of expression as well as utilized a more accurate quantitative PCR method.