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The expression of dengue virus serotype 1 nonstructural protein Ns5 inhibits HIV replication in A Cd4+T cell line

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Although dengue virus is transmitted in tropical areas where there is a high incidence of HIV-infected people, little has been described about the HIV-Dengue virus interaction. HIV viral load is inhibited during dengue infection. Previous studies have reported that the expression of DENV2 NS5 protein is associated with significant suppression (>90%) of HIV replication in vitro. This study analyzes the effect of the expression of DENV1 NS5 protein in CD4+T cells. A pIRES2-EGFP plasmid containing DENV1 NS5 sequence was constructed. This plasmid was transfected into Jurkat CD4+T cells. Transfected cells expressing NS5 protein were infected with HIV-1 (X4-Tropic virus). HIV replication was assessed through the measurement of HIV p24 antigen by ELISA. This study was approved by the Research Ethics Committee of the Center for Biomedical Research, University of Colima. HIV p24 antigen levels in transfected cells were significantly lower than levels in non-transfected HIV-infected cells during 7 days of analysis. The minimum percentage (14.40%) of inhibition of HIV replication was obtained on the 3rd day, and the highest percentage (28.88%) of inhibition was measured on the 5th day compared with control cells ($p < 0.05$). The expression of DENV1 NS5 protein inhibits HIV replication in Jurkat CD4+T cells. This is the first report that supports inhibition on HIV replication through DENV1 NS5 coding sequence in vitro. Additional studies are required to understand the mechanism of how DENV NS5 protein interferes on HIV replication. Furthermore, immune responses among these viral pathogens remain unknown. Assessing the anti-HIV activity of all dengue virus serotypes NS5 protein could contribute to a better understanding of the biology of HIV reproduction in the context of a viral co-infection.

Biography

Uriel A. Lopez-Lemus is completing a PhD program at the University of Colima. He has contributed in several projects for detecting risks of dengue virus transmission in Colima State-Mexico as part of his graduate studies. He has published one manuscript and three are in process. At this moment, he is a visiting scientist at Beckman Research Institute of City of Hope, CA, EUA. His main desire is to apply for a postdoctoral position in the field of gene therapy for treating HIV infection. One of his principal goals is to contribute for a new treatment against HIV infection using specific sequences of dengue virus genome.

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