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Funding Source: Life Sciences Undergraduate Research Opportunity Program

Do all viruses utilize CRM1 dependent nuclear export?

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The retroviral structural protein, Gag, is required for the assembly of infectious virus particles within a cell. To better understand how the viral assembly process occurs, it is important to understand the cellular pathways followed by the assembling virus. Previous studies have shown that the Rous Sarcoma Virus (RSV) Gag protein post-translationally traffics through the nucleus and is exported back into the cytoplasm via a Crm1 dependent nuclear export signal. The objective of this study was to determine if other retroviruses also utilize a Crm1 dependent nuclear export system. The retroviruses studied were Murine Leukemia Virus (MLV), Human T-cell Leukemia Virus (HTLV), Feline Immunodeficiency Virus (FIV), Mason Pfizer Monkey Virus (MPMV), and Human Immunodeficiency Virus type 1 (HIV-1). The Gag gene from each of these retroviruses was introduced into an expression construct with a C-terminal green fluorescent protein (GFP) tag. Tissue culture cells were transfected with the Gag fusion proteins and the distribution of Gag within the cell was observed by fluorescence microscopy. To determine if each Gag protein utilizes a CRM-1 dependent pathway, the cells were treated with leptomycin B, a CRM-1 inhibitor, prior to visualization. Our data conclusively shows none of the studied retroviruses except RSV Gag protein assembly with a nuclear step that is Crm1 dependent.