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Heterogeneity in Retroviral Nucleocapsid Protein Function CHRISTY LANDES, University of Houston — Time-resolved single-molecule fluorescence spectroscopy was used to study the human T-cell lymphotropic virus type 1 (HTLV-1) nucleocapsid protein (NC) chaperone activity as compared to that of the HIV-1 NC protein. HTLV-1 NC contains two zinc fingers with each having a CCHC binding motif similar to HIV-1 NC. HIV-1 NC is required for recognition and packaging of the viral RNA and is also a nucleic acid chaperone protein that facilitates nucleic acid restructuring during reverse transcription. Because of similarities in structures between the two retroviruses, we have used single-molecule fluorescence energy transfer to investigate the chaperoning activity of HTLV-1 NC protein. The results indicate that HTLV-1 NC protein induces structural changes by opening the transactivation response (TAR)-DNA hairpin to an even greater extent than HIV-1 NC. However, unlike HIV-1 NC, HTLV-1 NC does not chaperone the strand-transfer reaction involving TAR-DNA. These results suggest that despite its effective destabilization capability, HTLV-1 NC is not as effective at overall chaperone function as is its HIV-1 counterpart.

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