

Abstract Submitted  
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**Single-molecule Study of Nucleocapsid Protein Chaperoned DNA Hairpin Structural Dynamics** YINING ZENG, Department of Chemistry and Biochemistry, University of Texas at Austin, GONZALO COSA, Department of Chemistry, McGill University, HSIAO-WEI LIU, CHRISTY LANDES, DMITRII MAKAROV, PAUL BARBARA, Department of Chemistry and Biochemistry, University of Texas at Austin, KARIN MUSIER-FORSYTH, Department of Chemistry, University of Minnesota — In HIV-1 reverse transcription, the nucleocapsid protein, NC, induces secondary structure fluctuations in the transactivation response (TAR) region of DNA and RNA hairpins. Time resolved single-molecule fluorescence resonance energy transfer was used to study NC chaperoned secondary fluctuations of DNA hairpins. The experiments reveal that the NC induced secondary fluctuations are limited to the terminal stems, and the mechanism for the fluctuations is complex. The dynamic processes occur over a wide time range, i.e.  $\sim 5$  to  $>250$  milliseconds and involve long-lived intermediates. The dynamic role of DNA loop regions and NC binding/dissociation events are discussed.

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