

Abstract Submitted
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Laser-Assisted Single Molecule Refolding RUI ZHAO, MYLES MARSHALL, ELVIN ALEMAN, RAJAN LAMICHHANE, DAVID RUEDA, Wayne State University, Chemistry, RUEDA'S LAB TEAM — In vivo, many RNA molecules can adopt multiple conformations depending on their biological context such as the HIV Dimerization Initiation Sequence (DIS) or the DsrA RNA in bacteria. It is quite common that the initial interaction between the two RNAs takes place via complementary unpaired regions, thus forming a so-called kissing complex. However, the exact kinetic mechanism by which the two RNA molecules reach the dimerized state is still not well understood. To investigate the refolding energy surface of RNA molecules, we have developed new technology based on the combination of single molecule spectroscopy with laser induced temperature jump kinetics, called Laser Assisted Single-molecule Refolding (LASR). LASR enables us to induce folding reactions of otherwise kinetically trapped RNAs at the single molecule level, and to characterize their folding landscape. LASR provides an exciting new approach to study molecular memory effects and kinetically trapped RNAs in general. LASR should be readily applicable to study DNA and protein folding as well.

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