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Observation of an angular change in the structure of an RNA complex using Fluorescence Resonance Energy Transfer¹ SHEEMA RAHMANSERESHT, PEKER MILAS, LOUIS PARROT, LORI S. GOLDNER, University of Massachusetts, Amherst, Physics Department — Single-molecular-pair FRET is often used to study distance fluctuations of single molecules. It is harder to capture angular changes using FRET, because rotational motion of the dyes tends to wash out the angular sensitivity. Using a dye labeling scheme that minimizes the rotational motion of the dyes with respect to the RNA, we use spFRET to measure an angular change in structure of an RNA kissing complex upon protein binding. The model system studied here, R1inv-R2inv, is derived from the RNAI-RNAII complex in *E.coli*. RNA II is a primer for replication of the ColE1 plasmid; its function is modulated by interaction with RNA I, Rop protein is known to stabilize the bent R1inv-R2inv kissing complex against dissociation. The effect, if any, of Rop protein on the conformation of the kissing complex is not known. The eight minimized-energy NMR structures reported for R1inv-R2inv show a small difference in end-to-end distances and much larger differences in twist and bend angles. We compare a first-principles model with spFRET data to determine if the observed change in FRET is consistent with an angular change in structure, as suggested by the model.

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