

Talk Abstract:

Folding of the kink-turn RNA motif

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The kink turn is a widespread RNA motif that introduces an acute kink into the axis of an RNA duplex with an asymmetrical bulge followed by a G•A and A•G pairs (1). Previously, the kinked conformation has been shown to be stabilized by metal ions as well as the binding of proteins such as L7Ae. For the first time, we now demonstrate a third mechanism for the stabilization of k-turn structure, involving tertiary interactions within a larger RNA structure. The SAM-I riboswitch contains an essential standard k-turn sequence that kinks a helix so that its terminal loop can make a long-rang loop-loop interaction. We find that some sequence variations in the k-turn sequence within the riboswitch does not prevent SAM binding as shown by isothermal titration calorimetry and demonstrated by new crystal structures, despite preventing the folding of the k-turn in isolation as shown by FRET (2).

1. T.A. Goody, S.E. Melcher, D.G. Norman and D.M.J. Lilley (2004) The kink-turn motif in RNA is dimorphic, and metal ion dependent. *RNA* **10**: 254–264.
2. K.T. Schroeder, P. Daldrop and D.M.J. Lilley (2011) RNA Tertiary Interactions in a Riboswitch Stabilize the Structure of a Kink Turn. *Structure* **19**: 1233-1240.