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**Molecular mechanisms of Roquin-RNA complex formation**

mRNA *cis*-regulatory RNA elements recruit *trans*-acting factors to control transcript half-lives. The immune-regulatory protein Roquin binds and remodels constitutive and alternative decay element (CDE and ADE, respectively) stem-loops (SLs) and initiates mRNA decay. Binding to SLs is mediated through the core ROQ domain, which is flanked by two HEPN-domains that create a second RNA-binding site (extended ROQ). The interaction of core ROQ with SL elements has been long studied, but how both RNA binding sites recognize and remodel target RNA structures in a concerted manner remains elusive. We here use optical tweezer experiments and NMR spectroscopy to analyze folding pathways of the ADE of the crucial T cell co-receptor Ox40. We reveal stabilization of the apical RNA SL through Roquin binding. Further, we give evidence for additional interaction of extended ROQ with single-stranded RNA which requires partial unwinding of RNA duplexes in lower stem regions. We propose the expanded region to steer regulation by context-encoded specificity and suggest plasticity of stem structures as a determinant for full-length Roquin RNP formation. Our work reveals a previously unknown mechanism of a dual-function RNA binding surface and revises our previous model of Roquin RNA targets and their recognition. This study illustrates a powerful methodological toolbox to capture RNA folding intermediates and their role in RNP formation.

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