**Supplementary method File:**

**1. RNA sequencing**

1.1) Directly use RNA samples for microarray 14 or RNAseq analysis 15.

Note: It is recommended that two replicate IPs are combined to prepare suitable RNA sample for sequencing.

**2. Mass spectrometry**

2.1) Subject the eluates to immunoblot to validate isolation of RHA or other candidate RNA binding proteins.

2.2) To proceed to a proteomics analysis, subject the eluates analytical SDS-PAGE by sterile technique, commercial 4-15% gradient gels, and gel apparatus reserved for sterile technique to avoid protein contamination.

2.3) After staining and photo-documentation, harvest and process gel slices for mass spectrophotometry to identify proteins most abundant in the sample 24.

2.4) Also the total eluate can be used for mass spectrometry protein identification following specific methods 24.

Note: Detailed guidelines for sample preparation for proteomics analysis are typically provided by academic core or commercial facility. We achieved sufficient quantities of protein by harvesting RNPs from five 10 cm plates in 5 independent reactions.