Supplementary Methods

**MiRNA microarray analysis**

MiRNA from precleared input lysate (Input) and IP were labeled using the miRCURY™ Hy3™/Hy5™ Power labeling kit (Exiqon A/S, Denmark), and were hybridized on the miRCURY™ LNA Array (v.16.0) (Exiqon A/S, Denmark). All procedures were carried out according to the manufacturer’s protocol. Then, the slides were scanned using the Axon GenePix 4000B microarray scanner (Axon Instruments, Foster City, CA, USA). Scanned images were then imported into GenePix Pro 6.0 software (Axon Instruments) for grid alignment and data extraction. Replicated miRNAs were averaged, and miRNAs with intensities Z50 in all samples were chosen for calculating the normalization factor. Expressed data were normalized using the Median normalization. After normalization, differentially expressed miRNAs were identified through fold-change filtering. Hierarchical clustering was performed using the MEV software (v.4.6; TIGR, Boston, MA, USA). Differentially expressed miRNAs were defined as genes whose expression in the study group (sample name: MVH; sample name: IgG) was consistently altered two fold (either greater or less) compared with the control group (sample name: Input). Hierarchical clustering for differentially expressed miRNAs was generated by using standard correlation as a measure of similarity.

**In vitro Transcription of Biotinylated Tnp2**

To synthesize biotinylated Tnp2 transcripts, the DNA template used in the transcription system was generated by RT-PCR using forward primers containing the T7 RNA polymerase promoter sequence. *In vitro* transcription was performed using
MEGAscript® Kit (Life Technologies, USA) in the presence of Bio-16-UTP (Life Technologies, USA) according to the manufacturer’s instructions.

**Biotin Pull-Down Assay**

For *in vitro* RNA pull-down assay, sense or antisense biotin-labeled Tnp2 was incubated with lysates from HEK293T cells expressing pcDNA-flag-KSRP in binding buffer (10mM HEPES, pH 7.0, 50mM KCl, 10% glycerol, 1mM EDTA, 1mM DTT, 0.5% Triton-100, 10mg/ml tRNA, 50 mg/ml Heparin) for 1h at 4°C. Streptavidin-coupled Dynabeads (Invitrogen, USA) were then added to the reaction or 1h at 4°C. The beads were washed six times, and boiled in sodium dodecyl sulfate loading buffer. All processes were performed in the RNase-free conditions. Protein samples were resolved by Western blotting.