Supporting Information

Samatanga et al., 2012.

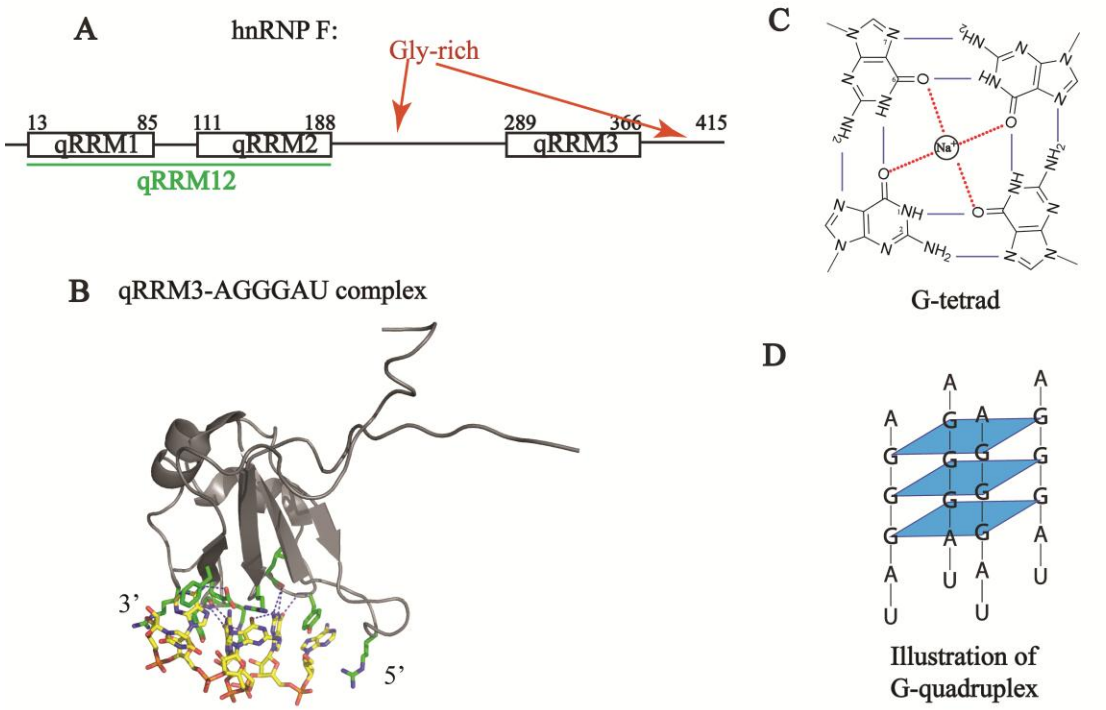

Figure S1. Structures and Illustrations of hnRNP F, qRRM3 and G-quadruplex RNA (A) Full-length hnRNP F contains three qRRMs ─ qRRM1, qRRM2 and qRRM3 ─ that are illustrated as boxes, and Gly-rich regions **(B)** NMR solution structure of qRRM3 in complex with 5'-AGGGAU-3' RNA (pdb: 2KG1). qRRM3 (gray) and the RNA (yellow) are represented as ribbons and sticks, respectively. Amino acids making contacts with RNA are shown as green sticks. Hydrogen bonds are represented as blue dashed lines. The figure was generated using the program PYMOL. **(C)** A schematic representation of a G-tetrad. The hydrogen bonds are shown in blue and the coordinations between the central Na^+ ion and O6 atoms of the guanines are displayed in red. **(D)** Illustration of a parallel tetramolecular G-quadruplex formed by the association of four 5'-AGGGAU-3' RNA monomers. The G-tetrads are colored in blue.

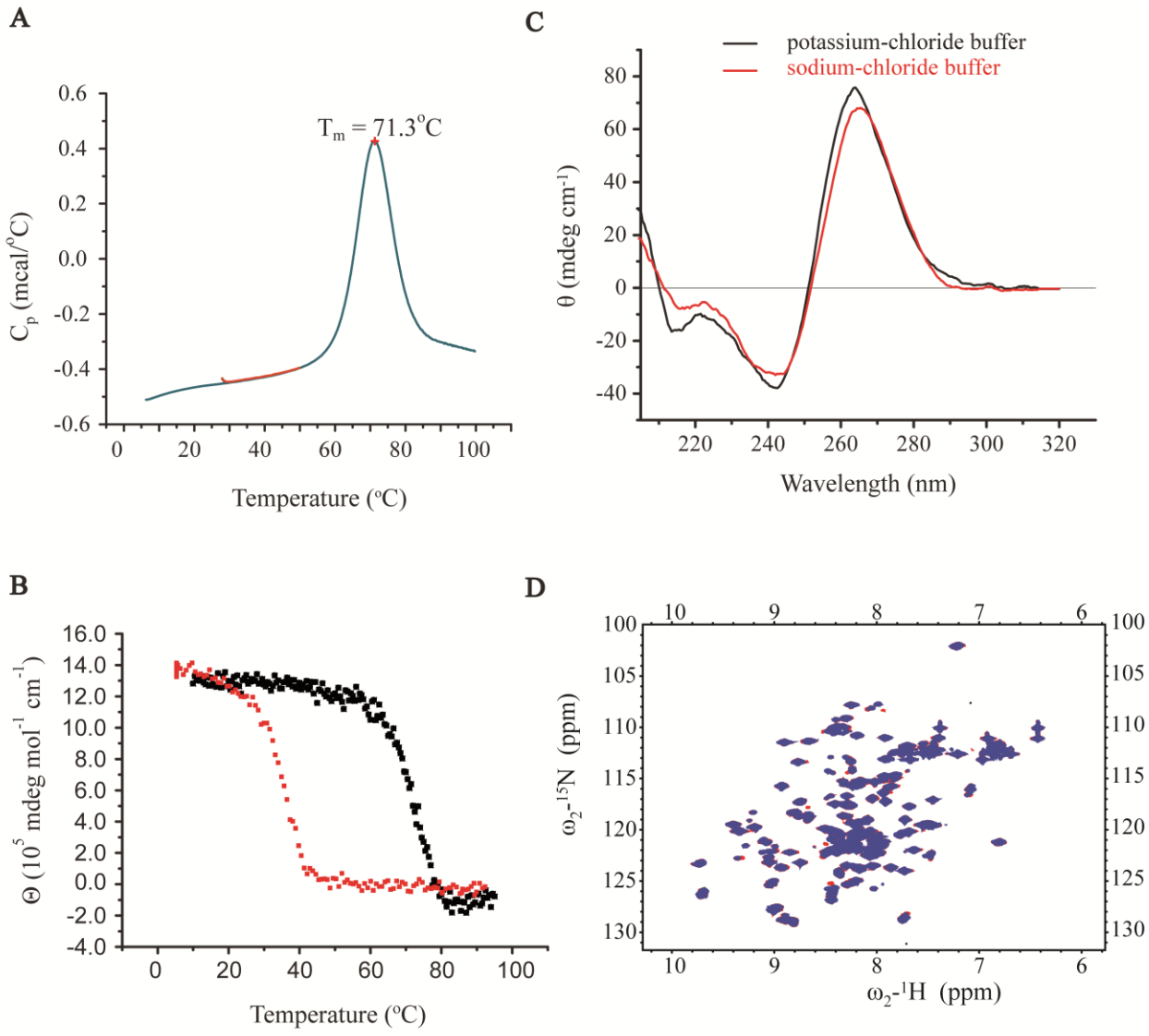

Figure S2. Conformations of reacting species, and specificity of qRRM3 (A) DSC data showing changes in heat capacity of 185 µM qRRM3 as function of temperature in sodium-phosphate buffer. The protein sample was heated repeatedly three times at a scan-rate of 1°C min^{-1} from 20 to50°C (red) followed by heating from 3 to 105°C (cyan). **(B)** CD thermal melting profile of 58 µM 5'-AGGGAU-3' in sodium (red; T_m = 37.4 °C) or potassium phosphate buffer (black; T_m = 73 °C). **(C)** CD spectra of 58 µM 5'-AGGGAU-3' measured in sodium (red) and potassium phosphate buffer (black) at 10°C. **(D)** ^{1}H-^{15}N HSQC spectra of free 0.2 mM qRRM3 (red) and 1:1 molar ratio of 0.2 mM qRRM3 with 0.2 mM 5'-AGGGAU-3' (blue) measured in potassium-phosphate buffer.

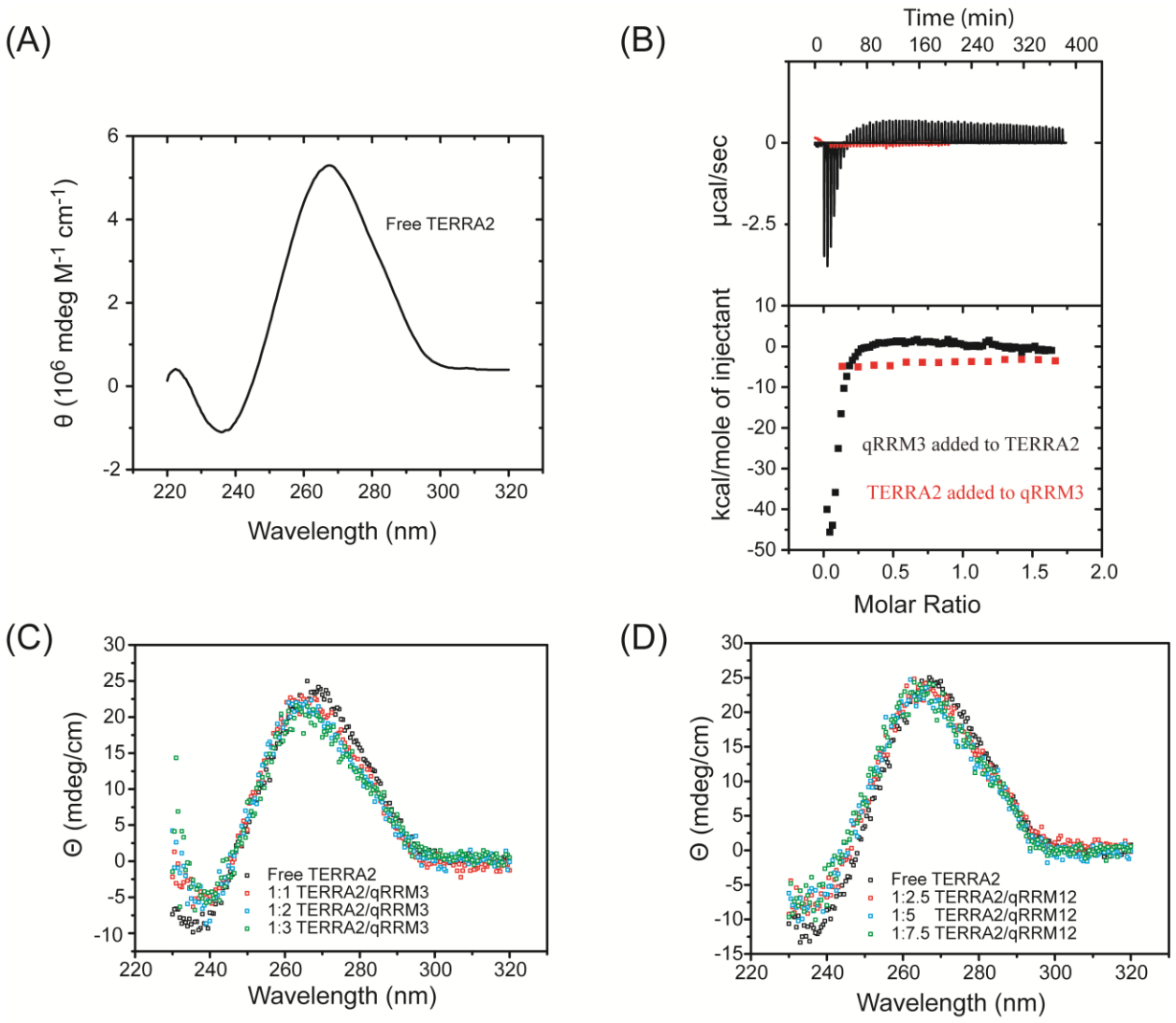

Figure S3: Interactions between qRRMs and 5'-GAG-(UUAGGG)$_4$-3'RNA. (A) CD spectrum of 5 µM 5'-GAG-(UUAGGG)$_4$-3' RNA measured in sodium-phosphate buffer at 298K temperature. **(B)** ITC titration data collected in sodium-phosphate buffer at 40 ^{o}C. 30 µM 5'-GAG-(UUAGGG)$_4$-3' RNA was titrated into 6 µM qRRM3 (red), and 850 µM qRRM3 was titrated into 30 µM 5'-GAG-(UUAGGG)$_4$-3' RNA (black). The molar ratio is based on the concentrations of binding sites. Each TERRA molecule contains four qRRM binding sites. **(C)** CD results measured in sodium phosphate buffer at 40 ^{o}C temperature showing the effect of titrating increasing concentrations of qRRM3 (20, 40, 60 µM) into 5 µM 5'-GAG-(UUAGGG)$_4$-3' RNA. The ratios are given in terms of available binding sites. **(D)** CD results measured in sodium phosphate buffer at 25 ^{o}C temperature showing the effect of titrating increasing concentrations of qRRM12 (25, 50, 75 µM) into 5 µM 5'-GAG-(UUAGGG)$_4$-3' RNA in sodium phosphate buffer at 25 ^{o}C temperature. The ratios are given in terms of binding sites. A single qRRM12 molecule contains two binding sites, one for each qRRM. The RNA has four binding sites. The contribution of added qRRM to the CD signal of the qRRM-RNA complexes was subtracted, in both Figures **(C)** and **(D)**. Small nonspecific contributions were corrected for by

zeroing the curves in the 310 – 320 nm region, in which neither protein, RNA or buffer shows a CD signal.

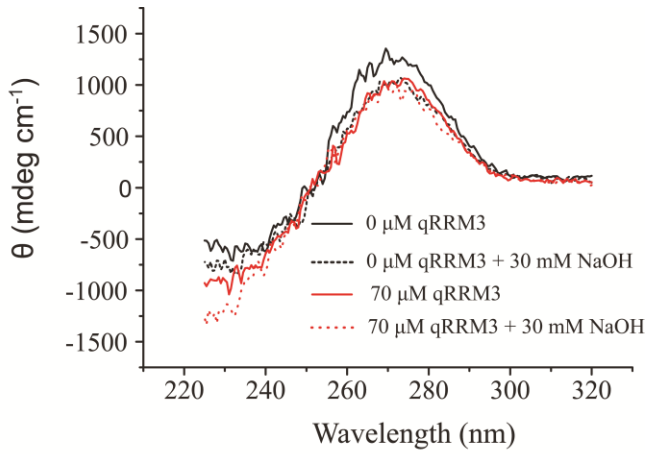

Figure S4. CD data showing the effect of NaOH on the transcription product. *In vitro* transcription was carried out in the absence (0 µM qRRM3) or in the presence of 70 µM qRRM3. 30 mM NaOH was then added to both transcription mixtures and CD spectra were collected at 37^{o}C temperature.