COMMUNICATION Material (ESI) for Chemical Communications

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Supporting Information for:

Cell-Permeable GPNA Containing Appropriate Backbone Stereochemistry and Spacing Binds Sequence-Specifically to RNA

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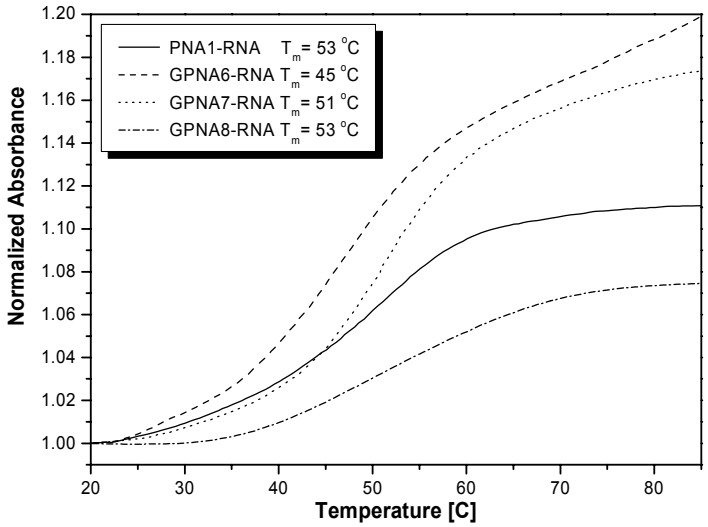

Figure S1. UV melting curves for PNA1-RNA and GPNA(6-8)-RNA duplexes. Thermal denaturation studies were performed on a Varian Cary 3 spectrophotometer equipped with thermoelectrically-controlled multicell holder, using 2 μM complementary strands in 100mM NaCl, 10mM sodium phosphate, and 1mM EDTA, pH 7. All samples were annealed before using for melting experiments by heating up to 90 °C and slowly cooling down to room temperature. Thermal denaturation was monitored at 260 nm at a heating rate of 1 ˚C/min from 20 to 90 ˚C. The melting transitions were determined from the first derivatives of the UV-melting curves.

Supplementary Material (ESI) for Chemical Communications

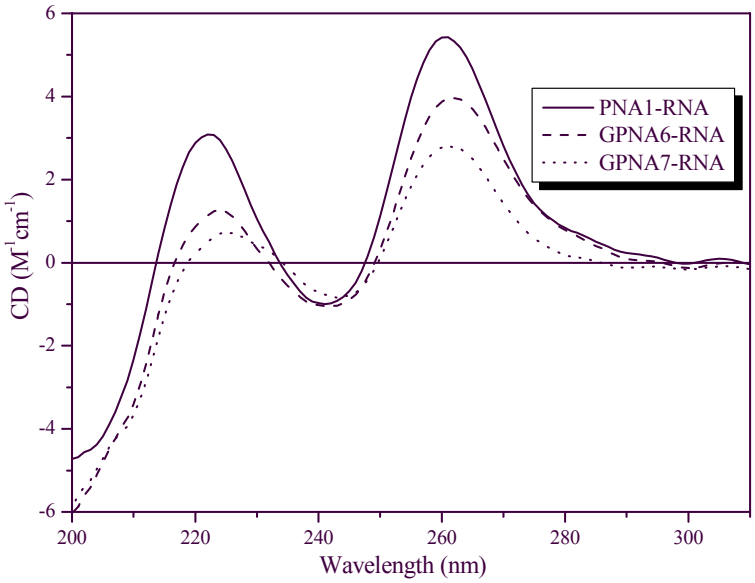

Figure S2. CD spectra of PNA1-RNA and GPNA(6-7)-RNA duplexes. CD experiments were performed on a Jasco J-715 spectropolarimeter using the same samples used for the melting experiments. Scans were run from 320 to 200 nm taking measurements every 1 nm. All spectra represent an average of at least 15 scans and were recorded at a rate of 100 nm/min. A 1-cm path-length cuvette was used, and the temperature was maintained at 22 ºC.

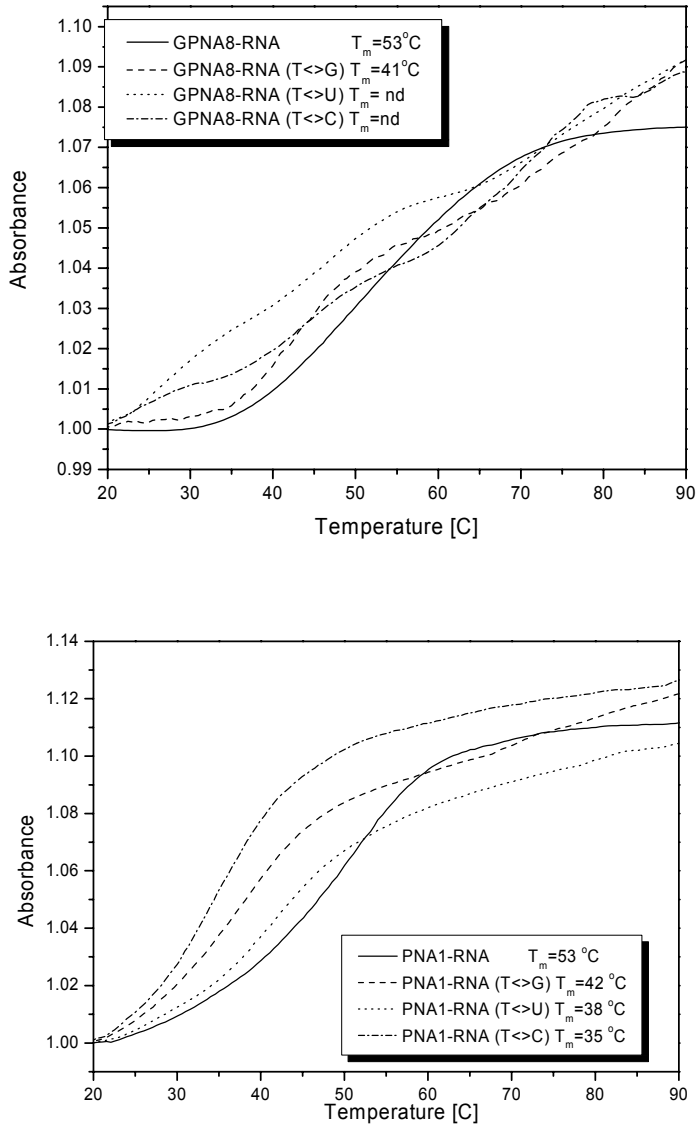

Figure S3. UV melting curves of GPNA8-RNA and PNA1-RNA duplexes for perfectly matched and mismatched sequences. Thermal denaturation studies were performed on a Varian Cary 3 spectrophotometer equipped with thermoelectrically-controlled multicell holder, using 2 μM complementary strands in 100 mM NaCl, 10 mM sodium phosphate, and 1 mM EDTA, pH 7. All samples were annealed before using for melting experiments by heating up to 90 ^{o}C and slowly cooling down to room temperature. Thermal denaturation was monitored at 260 nm at a heating rate of 1 ˚C/min from 20 to 90 ˚C. The melting transitions were determined from the first derivatives of the UV-melting curves.

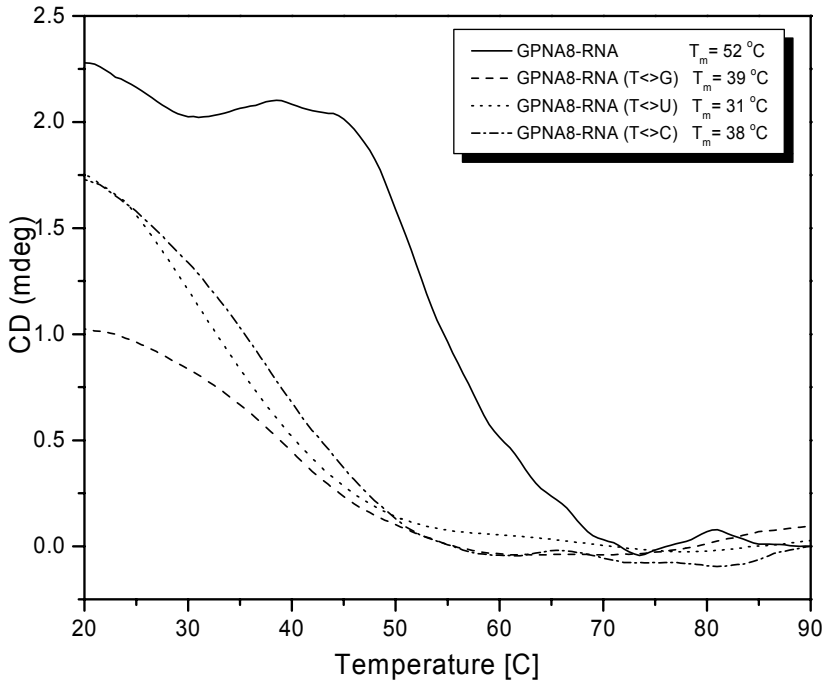

Figure S4. CD melting curves for GPNA8-RNA duplexes containing perfectly matched and mismatched sequences. The CD spectra were recorded at 260 nm as a function of temperature from 20 to 90°C. CD melting experiments were performed on a Jasco J-715 spectropolarimeter using 2 μM complementary strands in 100 mM NaCl, 10mM sodium phosphate, and 1mM EDTA, pH 7. All samples were annealed before using for melting experiments by heating up to 90 °C and slowly cooling down to room temperature. The melting transitions were determined from the first derivatives of the UV-melting curves.

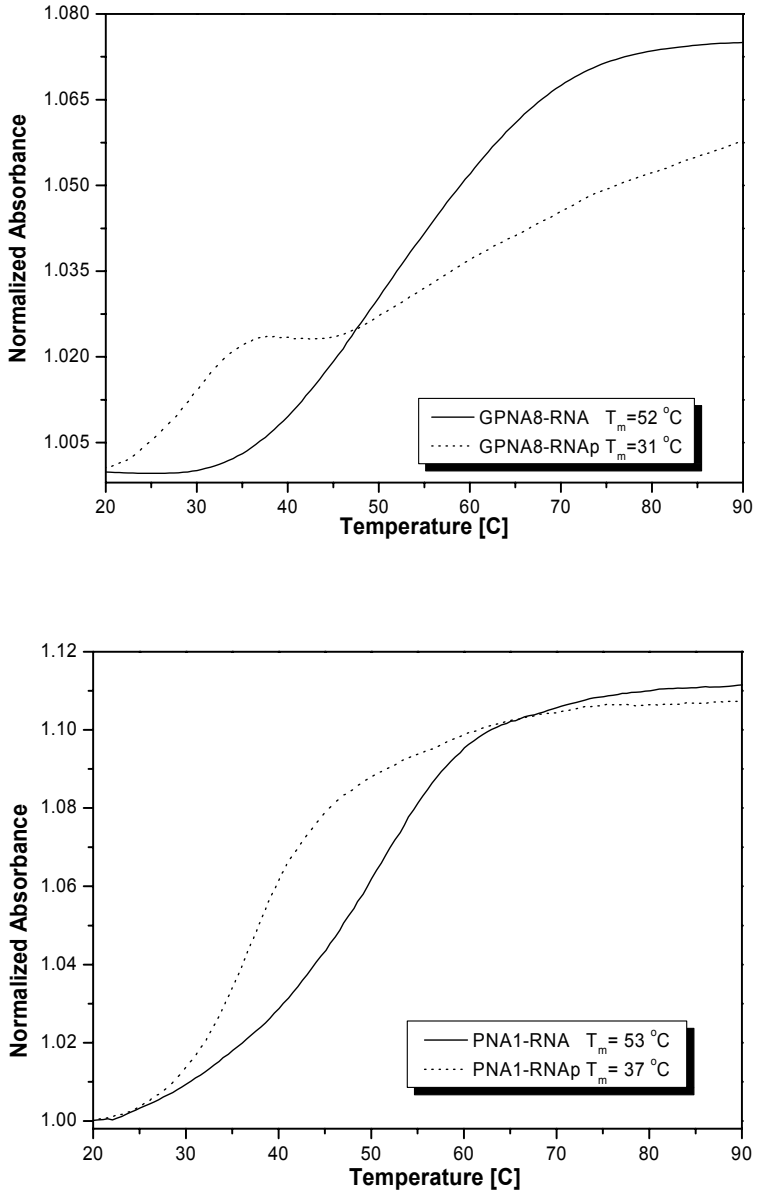

Figure S5. UV melting curves for antiparallel and parallel GPNA8-RNA and PNA1-RNA duplexes. Thermal denaturation studies were performed on a Varian Cary 3 spectrophotometer equipped with thermoelectrically-controlled multicell holder, using 2 μM complementary strands in 100 mM NaCl, 10 mM sodium phosphate, and 1 mM EDTA, pH 7. All samples were annealed before using for melting experiments by heating up to 90 °C and slowly cooling down to room temperature. Thermal denaturation was monitored at 260 nm at a heating rate of 1 ˚C/min from 20 to 90 ˚C. The melting transitions were determined from the first derivatives of the UV-melting curves.

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	PNA1 H-GCATGTTTGA-^{L}Lys-NH_2	**GPNA8** H- H-G^{D}**C**A^{D}**T**G^{D}**T**T^{D}**T**G^{D}**A**-NH_2
RNA 5'-UCAAACAUGC-3'	T_m = 53 ^{o}C	T_m = 52 ^{o}C
RNA-U 5'- UCA<u>U</u>ACAUGC-3'	T_m = 38 ^{o}C	T_m = 31 ^{o}C
RNA-C 5'- UCA<u>C</u>ACAUGC-3'	T_m = 35 ^{o}C	T_m = 38 ^{o}C
RNA-G 5'- UCA<u>G</u>ACAUGC-3'	T_m = 42 ^{o}C	T_m = 39 ^{o}C
RNAp 3'- UCA<u>G</u>ACAUGC-5'	T_m = 37 ^{o}C	T_m = 31 ^{o}C

S6. Tabulation of melting transitions between perfectly matched and mismatched antiparallel GPN8-RNA and PNA1-RNA, and perfectly matched parallel GPNA8-RNAp and PNA1-RNAp duplexes. The indicated T_ms were determined from the data shown in S3, S4, and S6.