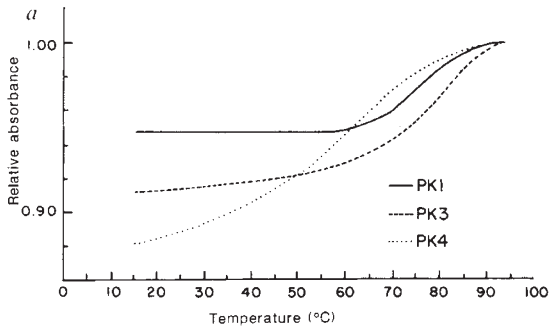
a



b

Molecule	T_m (°C)	ΔG (at 37°C) (kcal mol^{-1})	ΔS (at 37°C) (cal mol^{-1}K^{-1})	ΔH (at 37°C) (kcal mol^{-1})
PK1	73	-5.4	-160	-55
PK2	77	-5.3	-154	-53
PK3	78	-5.7	-130	-46
PK4	64	-2.4	-102	-34

Fig. 4 *a*, Normalized UV-absorbance melting curves for PK1, PK3 and PK4 in 0.35 mM $MgCl_2$, 10 mM sodium phosphate, *p*H 7.0. Data were collected at 260 nm and smoothed. RNA strand concentrations were 2 μM. From multiple aquisitions of data, we estimate a precision of ±0.5 absorbance units in the hypochromicity. The shape and T_m values of the melting curves for PK2, PK3 and PK4 are unchanged over a strand concentration range from 1 μM to 20 μM. At concentrations of PK1 strands between 2.5 μM and 10 μM the lower baseline of the melting curve has a positive slope, yet the T_m of the transition is unchanged. The shape of the melting curve for PK2 (not shown) is similar to that of PK3, except that the former has a steeper sloping lower baseline. This sloping baseline introduces a greater error in the determination of thermodynamic parameters for PK2 than for the other molecules (see below). *b*, Table of thermodynamic parameters for PK1, PK2, PK3 and PK4 in 0.35 mM $MgCl_2$, 10 mM sodium phosphate, *p*H 7.0. The melting temperature (T_m) is defined as the midpoint of the transition. Values of ΔG° are given at 37 °C. Estimated precisions in the various quantities are: $T_m \pm 1$ °C, ΔG° ± 0.2 kcal mol^{-1}, ΔS° ± 10 cal mol^{-1} K^{-1}, ΔH° ± 5 kcal mol^{-1} (except for PK2 where the corresponding precisions are, ΔH° ± 10 kcal mol^{-1}, ΔS° ± 15 cal mol^{-1} K^{-1}, ΔG° ± 0.3 kcal mol^{-1} due to uncertainty in the choice of baseline).

Methods. UV-absorbance melting curves were obtained on a Gilford Model 250 UV-vis spectrophotometer with a Gilford Model 2527 thermoprogrammer. Melting curves were analysed assuming a two-state transition. Fraction versus temperature and equilibrium constants were calculated as previously described[30]. Enthalpies were calculated using van't Hoff analysis of the entire fraction versus temperature profile and compared to the ΔH° obtained using the slope[30] of the curve of fraction versus temperature at the T_m. Values obtained by the two methods differed by less than 0.5 kcal mol^{-1}. Values of ΔS° were calculated using the relationship $\Delta S° = \Delta H°/T_m$. Melting curves were obtained over an RNA concentration range of 1 μM to 20 μM.

two nucleotides can result in a distortion of stem or loop structure. A distortion would be consistent with the low hypochromicity and enthalpic stabilization of PK1 in comparison to PK3. In general, the equilibrium between pseudoknotted and hairpin structures will depend on the relative free-energy contributions of the stem and loop regions in each structure. A systematic study of a variety of sequences is needed to determine these free-energy contributions, especially that of the loop regions in the pseudoknot. Elucidation of the conformation of a pseudoknot will require more detailed spectroscopic studies including NMR. The results detailed here indicate that pseudoknots are significant structural motifs which should be considered in prediction of the tertiary interactions in complex RNA molecules. Pseudoknots may be especially important as a means of bringing two separated nucleotides in a single strand into close spacial proximity.

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Errata

The origin of the clockwork-escapement

Nature **330,** 615 (1987).

THE name and address for the author of this piece of Scientific Correspondence were given incorrectly in the 17 December issue, and should read: Annie Lantink-Ferguson, B. de Beaufortweg 61, 3833 AE Leusden-Centrum, The Netherlands.

Limits on quantitative information from high-resolution electron microscopy of $YBa_2Cu_3O_7$ superconductors

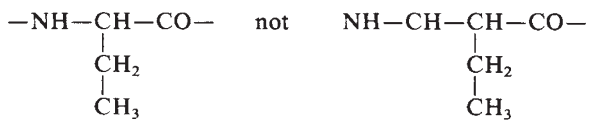
N. P. Huxford, D. J. Eaglesham & C. J. Humphreys
Nature **329,** 812-813 (1987).

IN this letter the images for Figs 1 and 2 were transposed.

No requirement of cyclic conformation of antagonists in binding to vasopressin receptors

M. Manning, J. P. Przybylski, A. Olma, W. A. Klis, M. Kruszynski, N. C. Wo, G. H. Pelton & W. H. Sawyer
Nature **329,** 839-840 (1987).

IN this letter, the structure for α-aminobutyryl in the footnotes to Table 1 is incorrect. It should be:



In addition, the page numbers in ref. 1 should read 802-870, not 802-807.