Electronic Supplementary Information (ESI)

A novel molecular logic system based on lead-induced substitution of potassium from G-quadruplex as a fluorescent lead sensor

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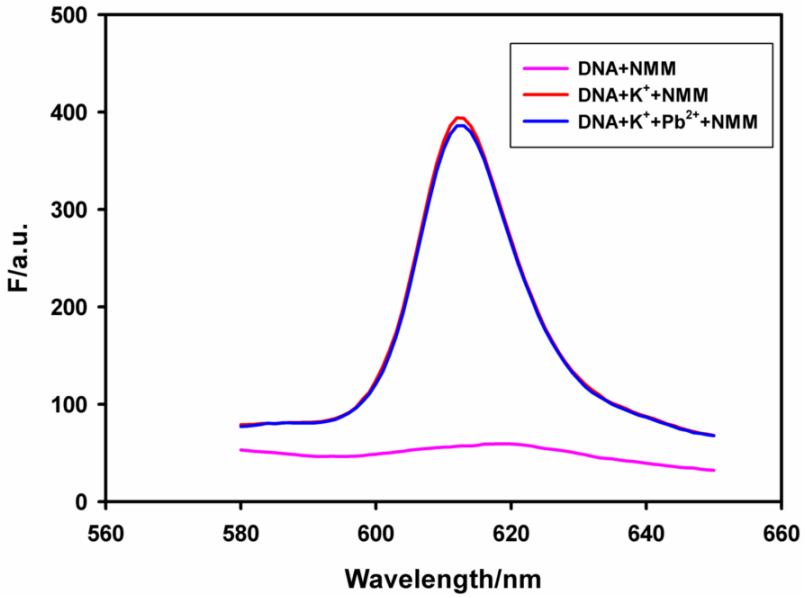

Fig. S1 Fluorescence emission spectra of DNA (400 nM) at different conditions: 400 nM NMM (curve in pink), 2 mM K^+ and 400 nM NMM (curve in red), 2 mM K^+, 400 nM Pb^{2+} and 400 nM NMM (curve in blue), respectively. The DNA sequence is 5-AAGGGTGGGTGGGTGGGTACCCTT-3. All measurements are performed in Tris-HCl (10 mM, pH 7.4).

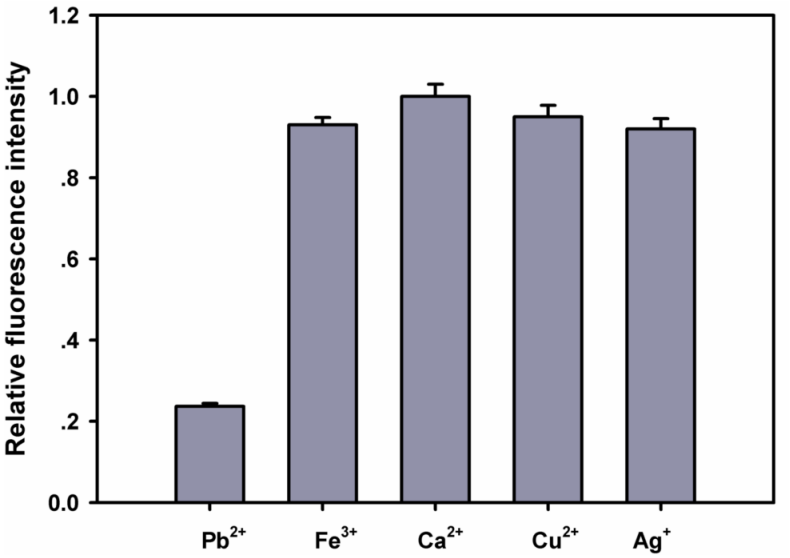

Fig. S2 Selectivity of label-free logic gate for detection of Pb^{2+} in the presence of K^{+} (2 mM). The concentration of Pb^{2+} and other metal ions are 400 nM and 5 μM, respectively. All the experiments are performed under the optimal experimental conditions.

Table S1 Analysis of Pb^{2+} in tap water samples by the proposed biosensor.

Sample	Pb^{2+} added (nM)	Pb^{2+} found (nM)	Recovery (%)
Tap water 1	15	14.2	94.6
Tap water 2	40	37.4	93.5
Tap water 3	70	66.4	94.8
Tap water 4	120	117.1	97.6
Tap water 5	150	148.5	99.0

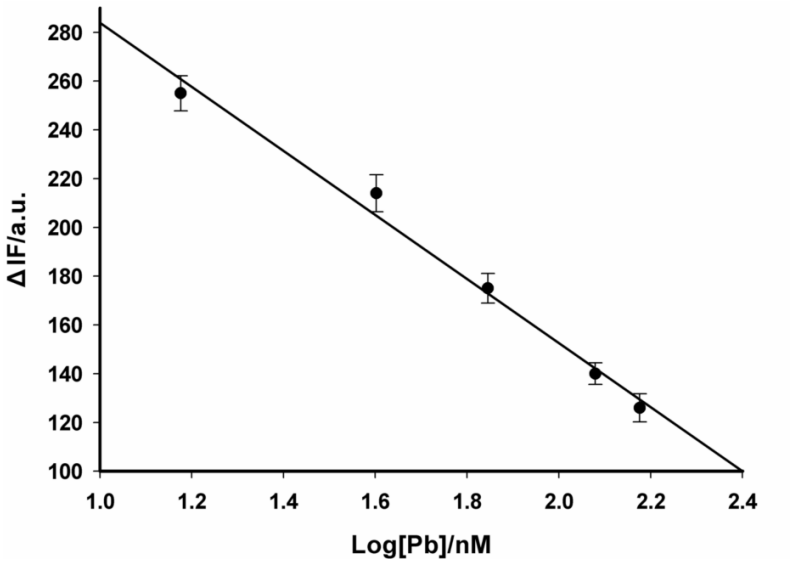

Fig. S3 Calibration curve of Pb^{2+} assay in tap water. All the experiments are performed under the optimal experimental conditions. The background fluorescence of free NMM is substracted from the sample solution.