Supporting Information

Experimental details

Materials and chemicals

The DNA is synthesized by Sangon Inc. (Shanghai, China). Its sequence is shown below:

5'-CGCAGG(rA)TGTCGCCCGGGTAGGGCGGGTAGGGCGACAAGCTGGCCG AGCCTCTGCG-3'

Where *rA* is ribo-adenine. $ABTS^{2-}$ and hemin are bought from Aladdin Reagents (Shanghai, China). All other chemicals are of analytical grade. Metal ion solutions are prepared from nitrate salts.

All aqueous solutions are prepared by Milli-Q reagent water (Milli-Q, Millipore, 18.2-MΩ resistivity). DNA stock solution (the concentration of oligonudeotide is 10 μmol/L) is prepared with 40 mmol/L Tris-acetate (TAE) (pH 7.4) containing 0.10 mol/L $NaNO_3$ and stored at 4 □ until being used. The hemin stock solution (10 mmol/L) is prepared in dimethylsulfoxide (DMSO) and stored in the dark at -20 □. $ABTS^{2-}$ and H_2O_2 working solutions are freshly prepared with 25 mmol/L TAE (pH 7.4) containing 150 mmol/L NaCl, 20 mmol/L KCl, 0.03% Triton X-100, and 1% DMSO before being used.

Assay of Pb^{2+}

The colorimetric detection of Pb^{2+} is performed at room temperature. The DNA solution from diluting the DNA stock solution has been heated at 80 □ for 10 min,

and then cooled to room temperature. Then different concentrations of Pb^{2+} were added into above solution. The final concentration of DNA in the mixture is 0.1 μmol/L. The mixture is incubated at room temperature for 16 h. Hemin and $ABTS^{2-}$ is added into the solution with a final concentration of 0.1 μmol/L and 3 mmol/L, respectively. The mixture is then held for 0.5 h. The peroxidase-mimicking reaction is initiated by the introduction of 3 mmol/L H_2O_2 (final concentration). After these, the mixture is incubated until the solution has a stable color. Then the absorption spectradata is recorded with a UV-Vis spectrophotometer (Lamda 750 UV-Vis spectrophotometer, PE, USA) in the wavelength range from 500 to 410 nm.

Table S1 Determination of Pb^{2+} in water samples using the proposed method.

[a] Mean of three determinations. [b] SD, standard deviation.

	Added (nM)	Founded (nM) Mean [a]±SD [b]	Recovery (%)
Sample1	100	91±8	91
Sample2	200	209±10	104.5
Sample3	300	295±10	98.3