Electronic Supplementary Material (ESI) for Chemical Communications

Electronic Supporting Information

Designing label-free DNA sequences to achieve controllable turn-off/on fluorescence response for Hg^{2+} detection

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Experimental Details

DAPI was purchased from Dingguo Biotechnology Company, Wuhan, P. R. China. DNA was purchased from Sangon Biotech (Shanghai) Co., Ltd. Perchlorate salts were purchased from Alfa Aesar. All the reagents were used directly without further purification. Fluorescence spectra were recorded on Hitachi F-4500 fluorescence spectrophotometer. All the solutions were mixed fully and then stood for 5 minutes before the fluorescence intensity were measured. Subsequent titration experiments were carried out at room temperature by addition of perchlorate salts dissolved in distilled water into the buffer solutions. Three parallel fluorescence tests were carried out, and the relative deviations of fluorescence intensity were below 5%. CD measurements were carried out using a Chirascan spectropolarimeter (Applied Photophysics, UK) with a 1 cm optical path cell.

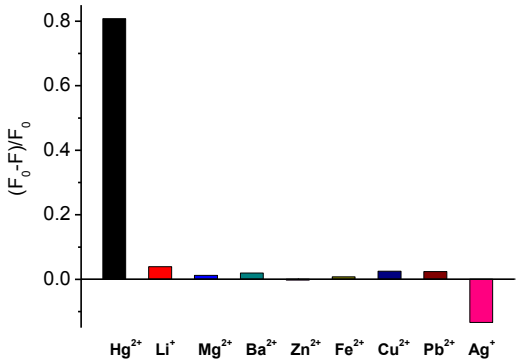

Figure S1 The change in fluorescence intensity between the blank and solutions containing different ions in 10 mM sodium phosphate buffer (pH 7.0) at room temperature. The concentrations of metal ions were 1 μM. F_0 = fluorescence intensity in the absence of ions, F = fluorescence intensity in the presence of ions. [DAPI] = 1 μM. [DNA1] = [DNA2] = 0.2 μM. The excitation and emission wavelengths were 360 and 460 nm.

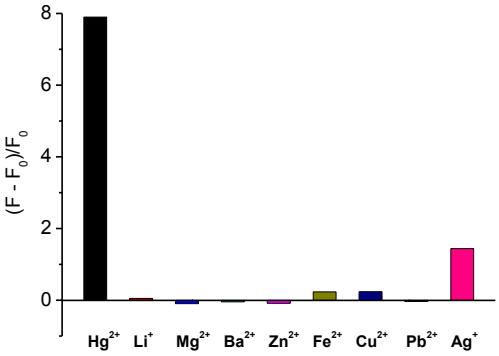

Figure S2 The change in fluorescence intensity between the blank and solutions containing different ions in 10 mM sodium phosphate buffer (pH 7.0) at room temperature. The concentrations of all ions were 0.2 μM. F0 = fluorescence intensity in the absence of ions, F = fluorescence intensity in the presence of ions. [DAPI] = 100 nM. [DNA3] = 20 nM. The excitation and emission wavelengths were 360 and 450 nm.

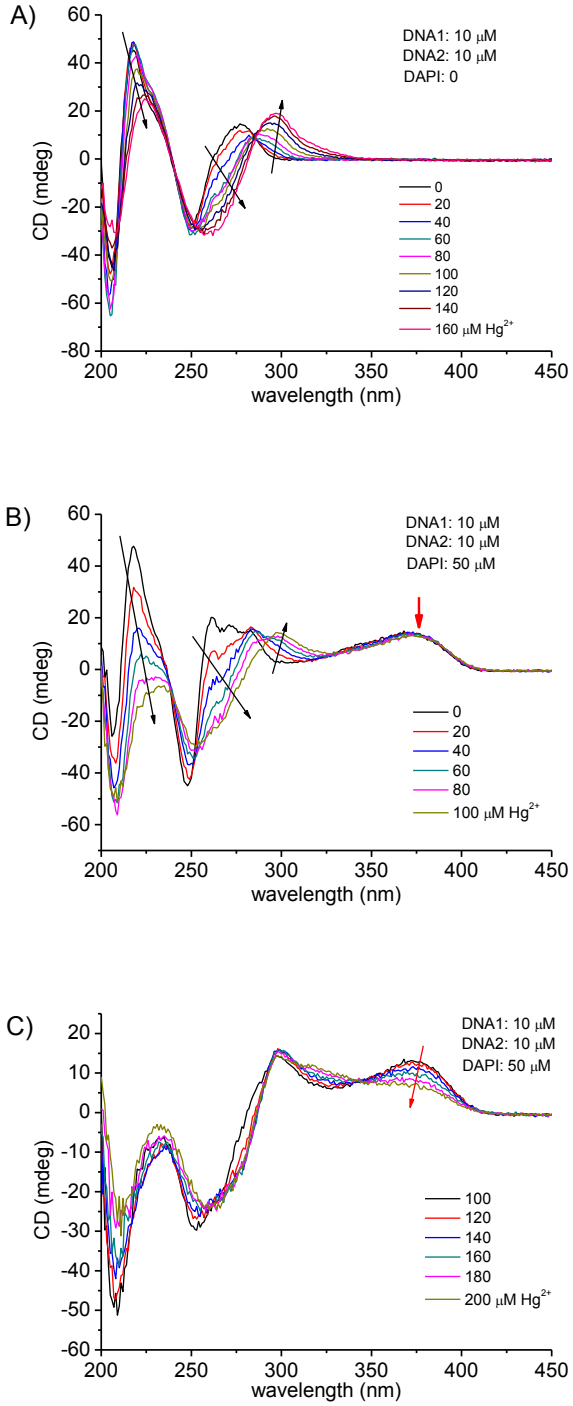

Figure S3 Titration of the DNA1/DNA2 with Hg^{2+} in 10 mM sodium phosphate buffer (pH 7.0) at room temperature. [DNA1] = [DNA2] = 10 μM. (A) [DAPI] = 0 μM; (B) and (C) [DAPI] = 50 μM.

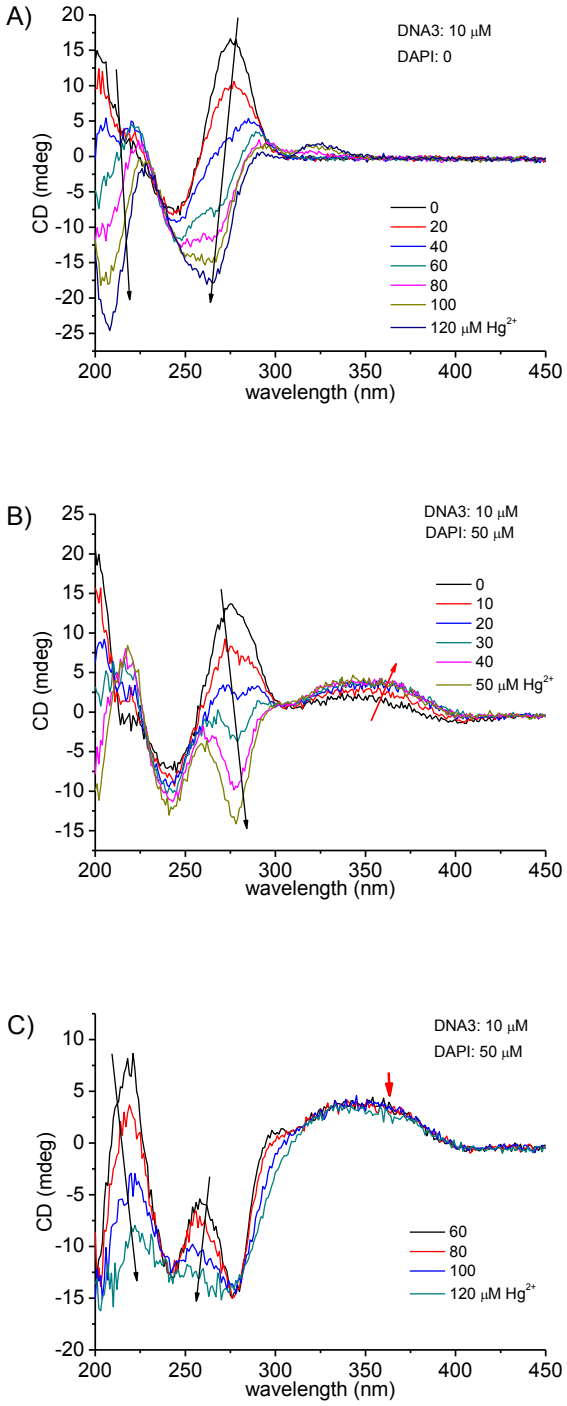

Figure S4 Titration of the DNA3 with Hg^{2+} in 10 mM sodium phosphate buffer (pH 7.0) at room temperature. [DNA3] = 10 μM. (A) [DAPI] = 0 μM; (B) and (C) [DAPI] = 50 μM.