Electronic Supplementary Material (ESI) for Chemical Communications

SUPPORTING INFORMATION

DNA-templated ensemble for label-free and real-time fluorescence turn-on detection of enzymatic/oxidative cleavage of single-stranded DNA

EXPERIMENTAL SECTION

Materials and methods

Ligand 1 was prepared as previous reported.[1] S1 nuclease was purchased from TaKaRa biotechnology CO., Ltd. Single-stranded oligonucleotides (ssDNA) used in this study were obtained from Shanghai Sangon Biological Engineering Technology & Services Co.,Ltd and purified by PAGE method. All other chemicals were of analytical reagent grade and used without further purification. Ultrapure water was used throughout this work and purified by a Milli-Q water system. Steady-state fluorescence measurements and time curves were carried out by using a JASCO FP-6500 spectrofluorometer. Stopped-flow fluorescence measurements were performed under standard buffer conditions by using a stopped-flow device from Applied Photophysics (Leatherhead, Surrey, KT227PB, UK) in two-syringe mode.

The sequences of the single-stranded DNAs with different base length are as follows:

DNA-1	TGTCTG	6 mer
DNA-2	TGTTTTGTCT	10mer
DNA-3	CCAGATACTCACCGG	15mer
DNA-4	ATCGTATAATGGTTTCGTTC	20mer
DNA-5	CTAACGGAATGTTCATTCGGTTAG	24mer
DNA-6	TTACGGAAACGGAATTTATTCGGTATCGGTTA	32mer

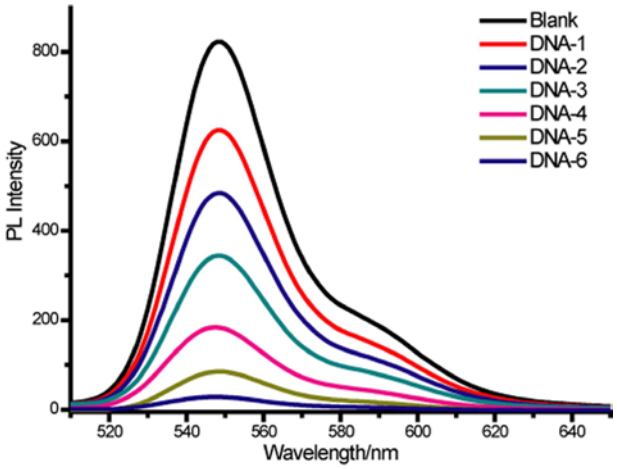

Fig. S1 The PL spectra of ligand 1 in the presence of ssDNAs with different base lengths. [Ligand 1] = 1×10^{-6} M, [ssDNA]= 1×10^{-7} M. The measurements were performed in Tris-HCl buffer (20 mM, pH = 7.0).

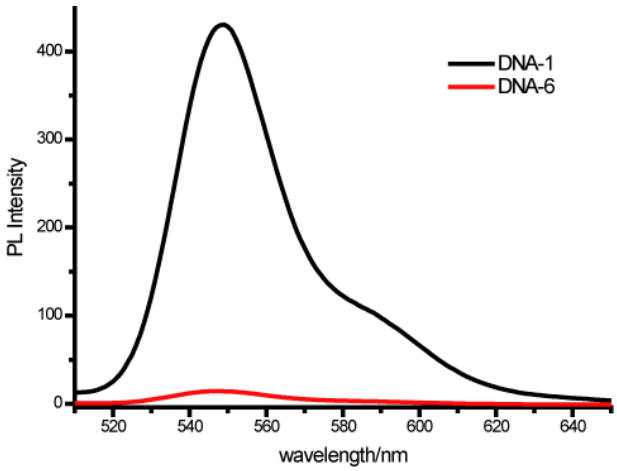

Figure S2 The PL spectra of ligand 1 in the presence of DNA-1 (6-mer) or DNA -6 (32-mer) with the same base concentration. [Ligand 1] = 1×10^{-6} M, $[base]_{DNA\text{-}1}$ = $[base]_{DNA\text{-}6}$ = 3.2×10^{-6} M. The measurements were performed in Tris-HCl buffer (20 mM, pH=7.0).

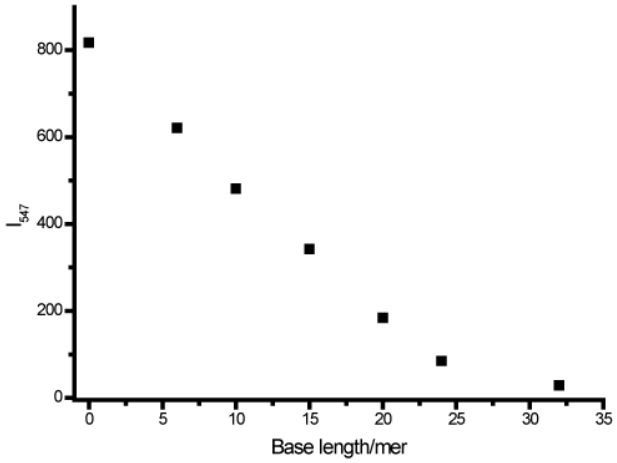

Figure S3 PL I_{547} of ligand 1 in the presence of ssDNAs with different base lengths. [Ligand 1] = 1×10^{-6} M, [ssDNA] = 1×10^{-7} M. The measurements were performed in Tris-HCl buffer (20 mM, pH=7.0).

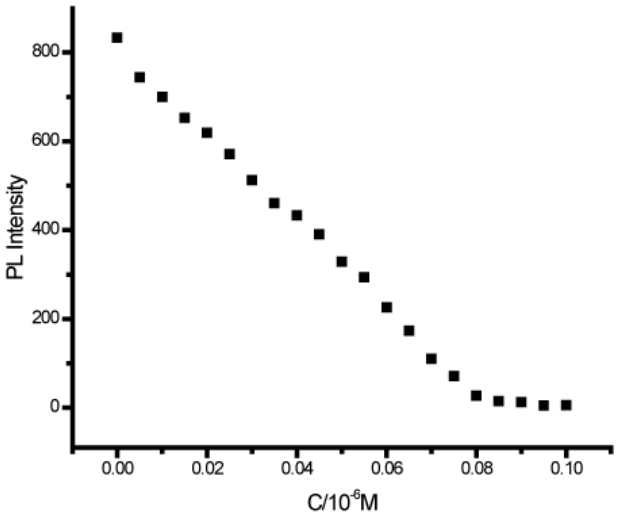

Figure S4 Fluorescence titration of ligand 1 with DNA-6 in tris-HCl (20mM, pH=7.0) at 25℃. [ligand 1]= 1×10^{-6} M

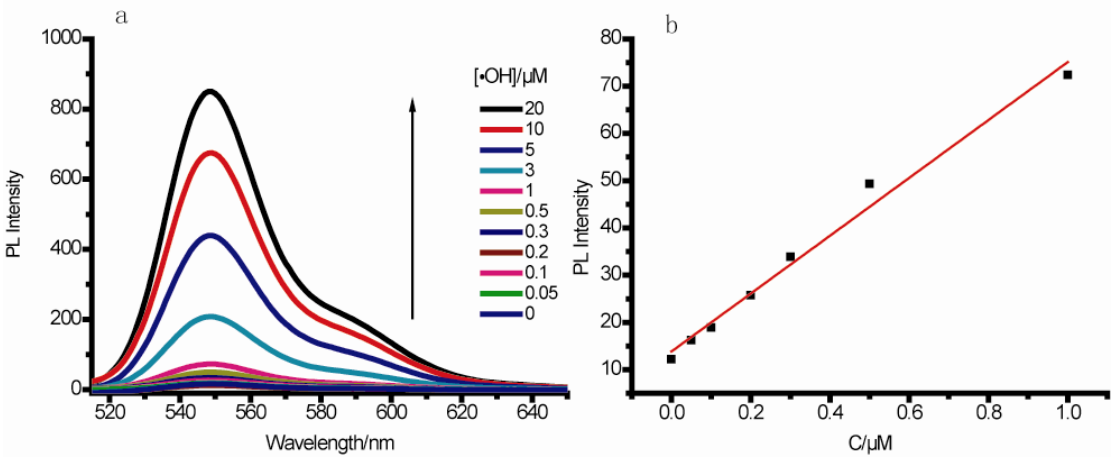

Figure S5 The fluorescence changes upon adding different amounts of hydroxyl radical in Tris-HCl buffer (20mM, pH=7.0) at room temperature (25℃). [ligand 1]= 1×10^{-6} M, [ssDNA]= 1×10^{-7} M, $[Fe^{2+}]$:$[H_2O_2]$ = 1:6.

[1] B. Wang and C. Yu, *Angew. Chem. Int. Ed.*, 2010, **49**, 1485-1488.