Electronic Supplementary Material (ESI) for RSC Advances.

Investigation of a Halloysite-Based Fluorescence Probe with a Highly Selective and Sensitive "Turn-On" Response upon Hydrogen Peroxide

------ Supporting Information

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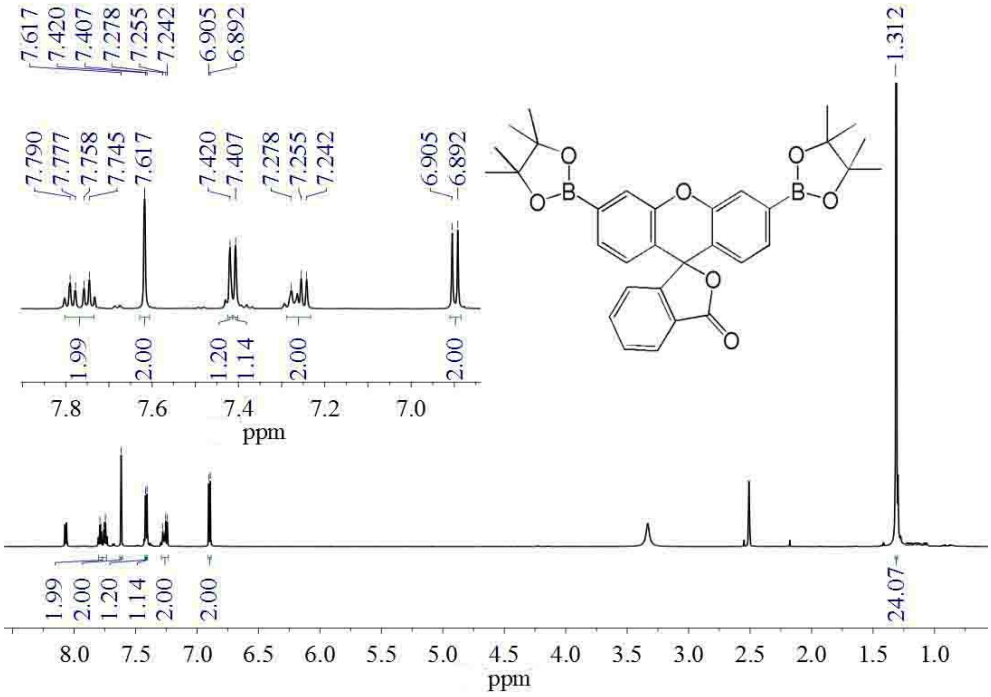

Figure S1. [1]H NMR spectra of PF1

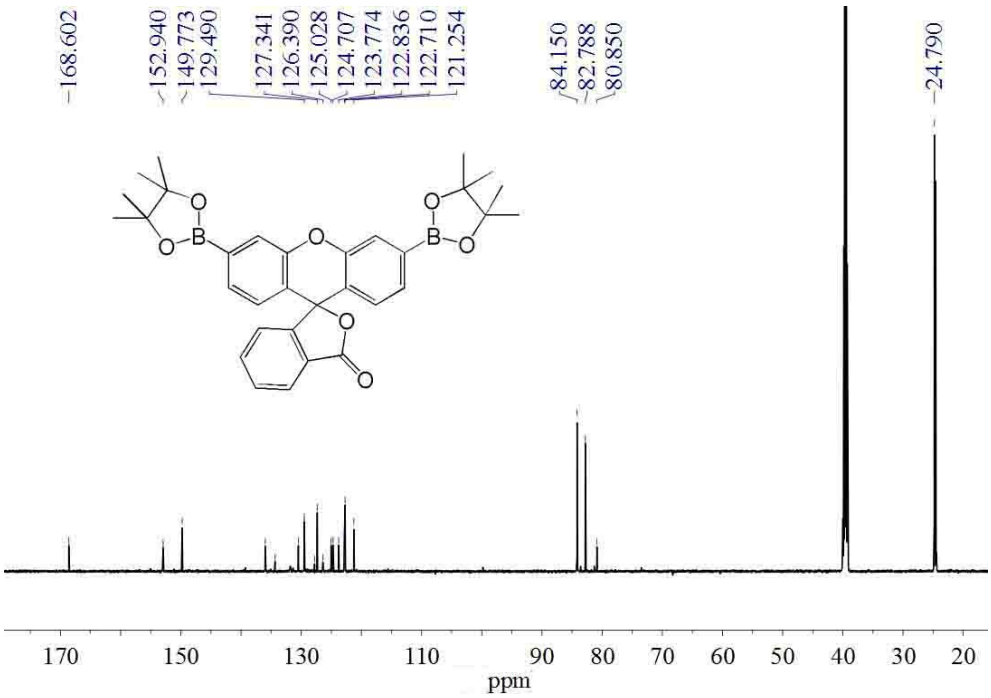

Figure S2. [13]C NMR spectra of PF1

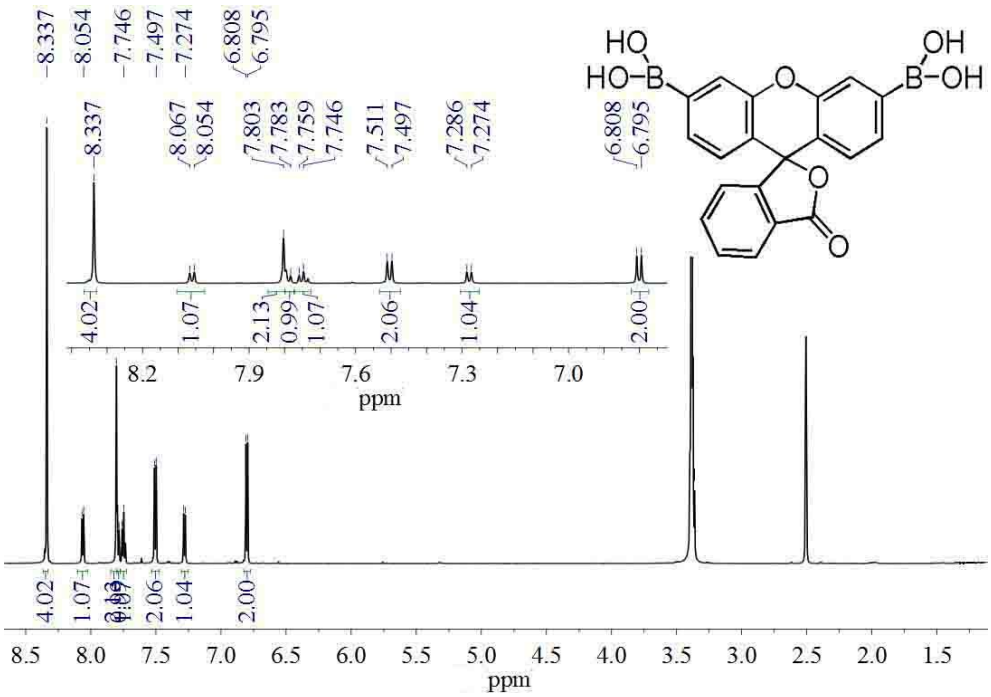

Figure S3. [1]H NMR spectrum of PA

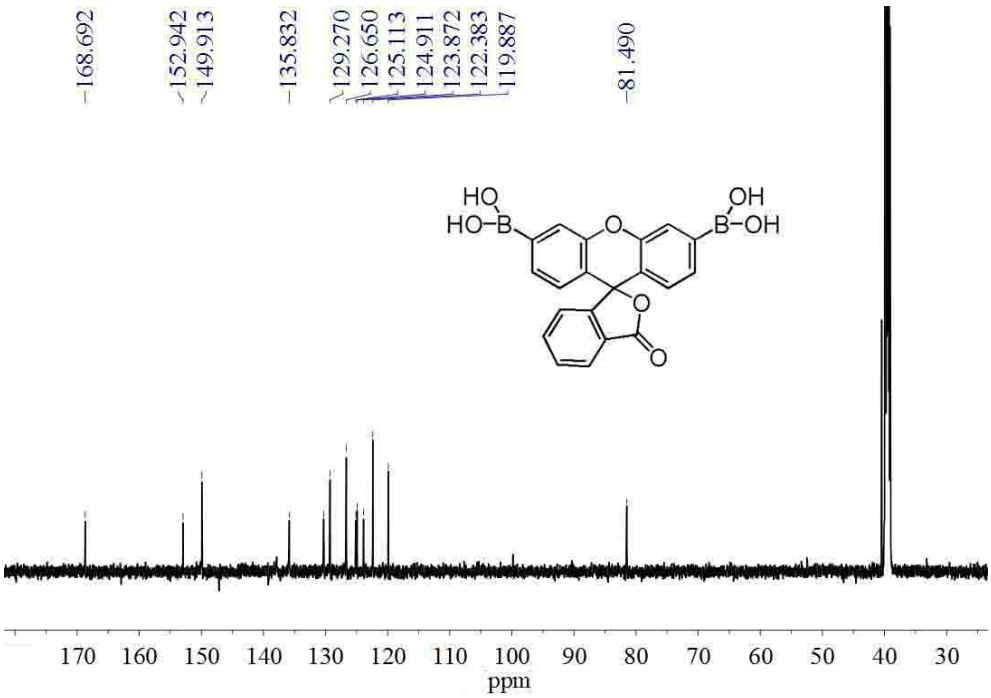

Figure S4. [13]C NMR spectrum of PA

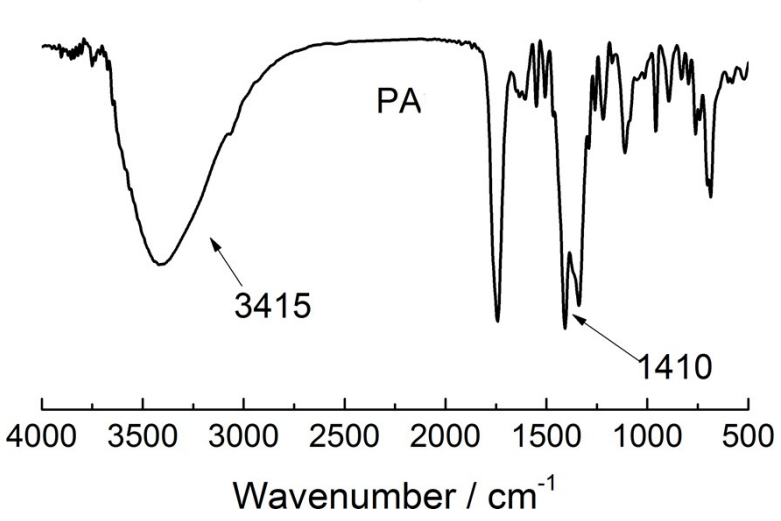

Figure S5. the FTIR spectrum of PA

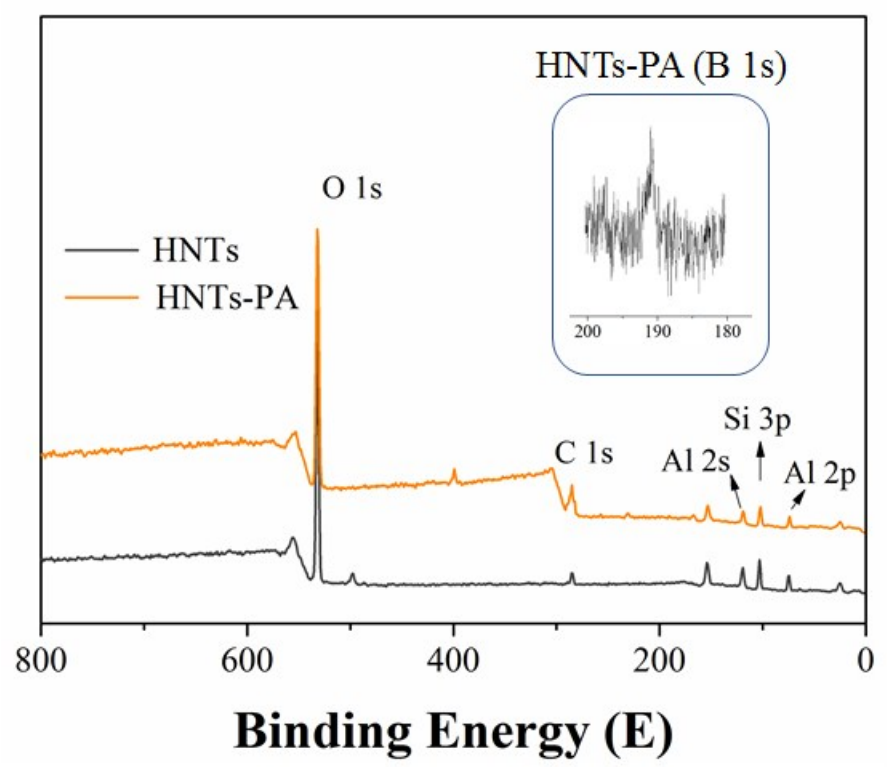

Figure S6. XPS spectra of HNTs and HNTs-PA

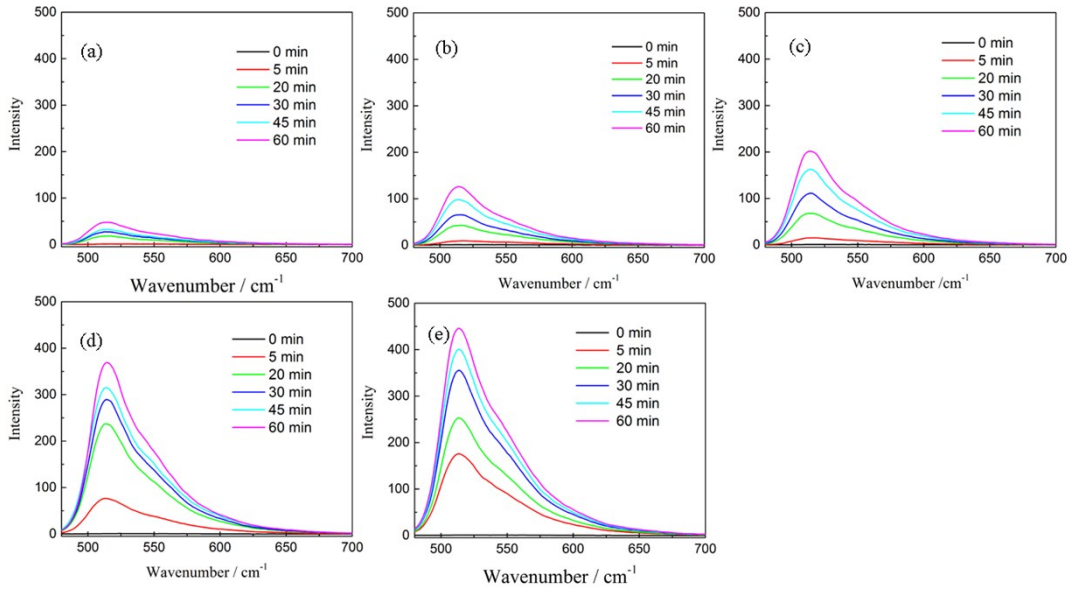

Figure S7. Fluorescence turn-on response of 0.1 mg/mL HNTs-PA. Date were acquired at 25 °C in 2 mL H_2O, with excitation at λ=470 nm and emission was collected between 480-700 nm. Time points represent 0-60 min after the addition of different times H_2O_2 (different times to the mole number of PA). (a) $[H_2O_2] = 5 \times 10^{-5}$ M (the addition amount of H_2O_2 is 1×10^{-7} mol); (b) $[H_2O_2] = 2.5 \times 10^{-4}$ M; (c) $[H_2O_2] = 5 \times 10^{-4}$ M; (d) $[H_2O_2] = 2.5 \times 10^{-3}$ M; (e) $[H_2O_2] = 2.5 \times 10^{-2}$ M. The turn-on response of each probe was completed at these time points.

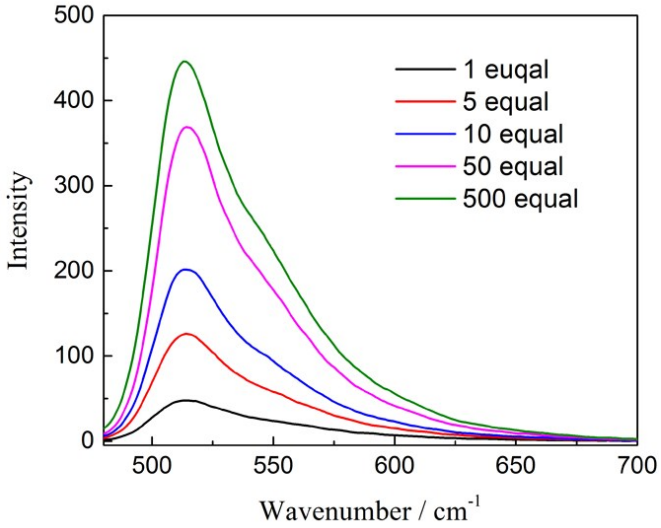

Figure S8. Fluorescence "turn-on" response of 0.1 mg/mL HNTs-PA. Date were acquired at 25 °C in 2 mL H_2O, with excitation at λ=470 nm and emission was collected between 480-700 nm for HNTs-PA. Time points represent 60 min after the addition of different times H_2O_2 (1 euqal represents $[H_2O_2] = 5 \times 10^{-5}$ M; 5 euqal represents $[H_2O_2] = 2.5 \times 10^{-4}$ M; 10 euqal represents $[H_2O_2] = 5 \times 10^{-4}$ M; 50 euqal represents $[H_2O_2] = 2.5 \times 10^{-3}$ M; 500 euqal represents $[H_2O_2] = 2.5 \times 10^{-2}$ M).

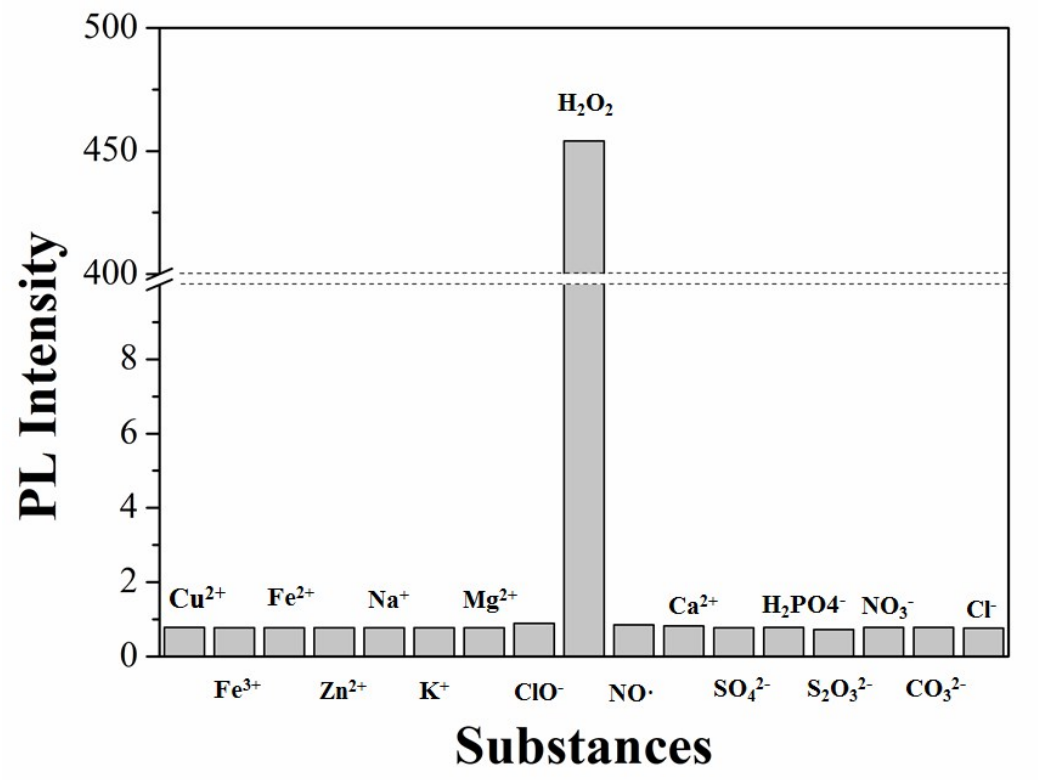

Figure S9. Fluorescence "turn-on" response of 0.1 mg/mL HNTs-PA upon different substances. Date were obtained at 25 °C in 2 mL H_2O, with excitation at λ=470 nm. The PL intensity represents the fluorescence intensity at the maximum emission wavelength.

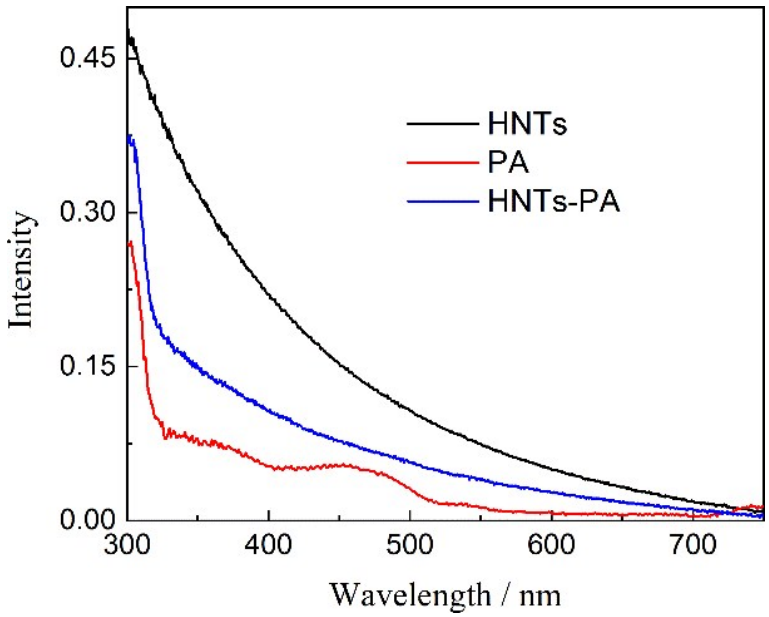

Figure S10. The UV-vis spectra of HNTs, PA and HNTs-PA

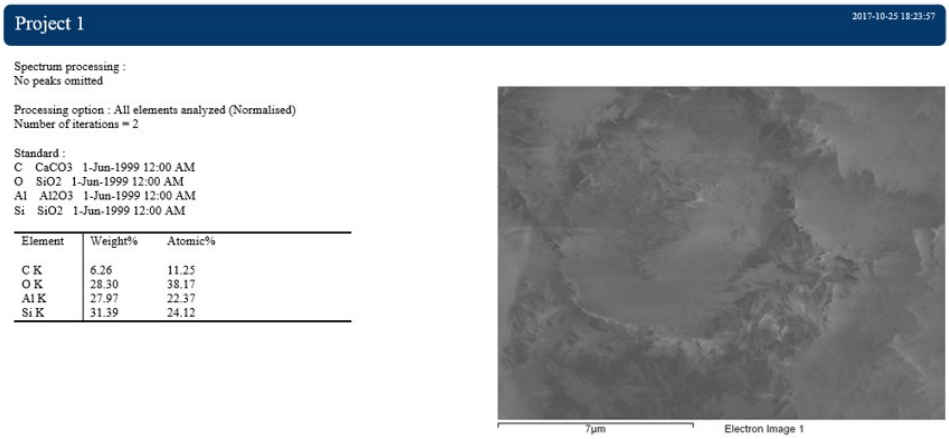

Figure S11. The energy dispersive spectra (EDS) results of HNTs-PA

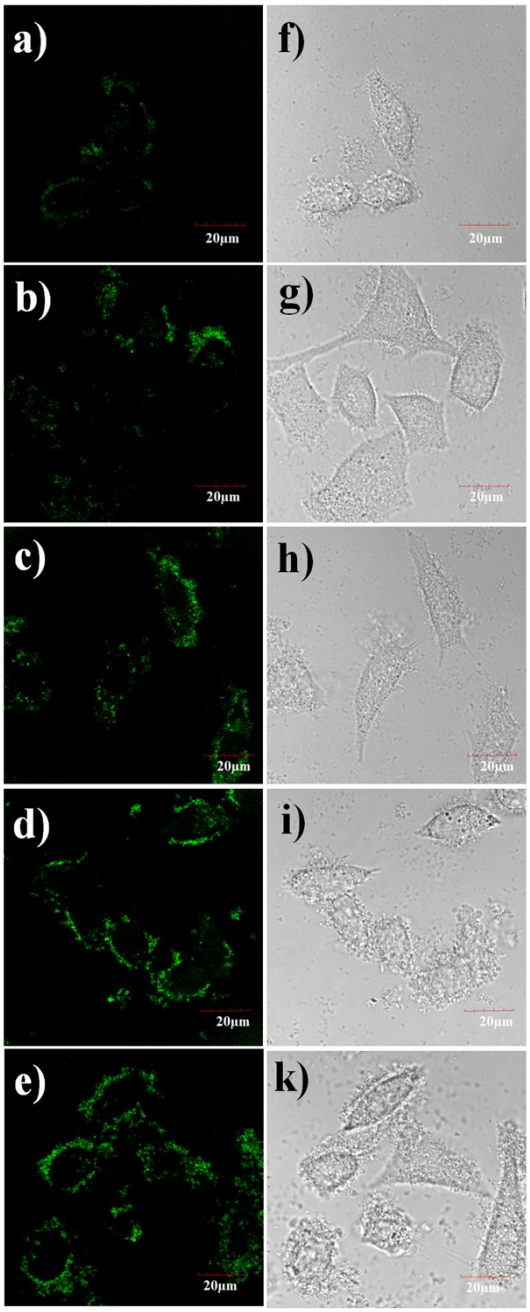

Figure S12. Confocal fluorescence images of living Hela cells after treating with 0.5 mg/mL HNTs-PA for 1 (a and f), 2 (b and g), 4 (c and h), 8 (d and i) and 12 h (e and k) at 37 ^{o}C. The excitation wavelength was fixed at 488 nm and fluorescent signals were collected from 500 to 600 nm.

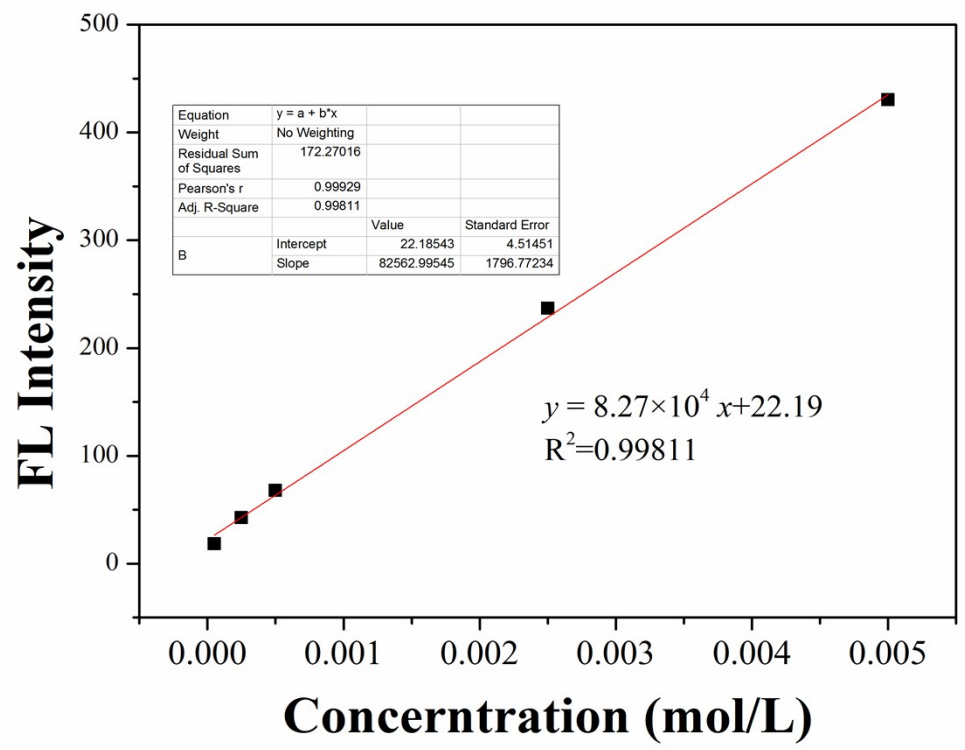

Figure S13. Plot of the fluorescence intensity of HNTs-PA solution *vs* the concentration of H_2O_2 (fluorescence intensity was recorded at 20 min after the addition of H_2O_2). Results of the linear regression for fluorescence intensity and concentration of H_2O_2 show that the linear correlation coefficient (R^2) is greater than 0.99 which indicates that the fluorescence intensity of HNTs-PA solution and concentration of H_2O_2 shows a good linearity relationship in the range from 5×10^{-5} to 5×10^{-3} M.

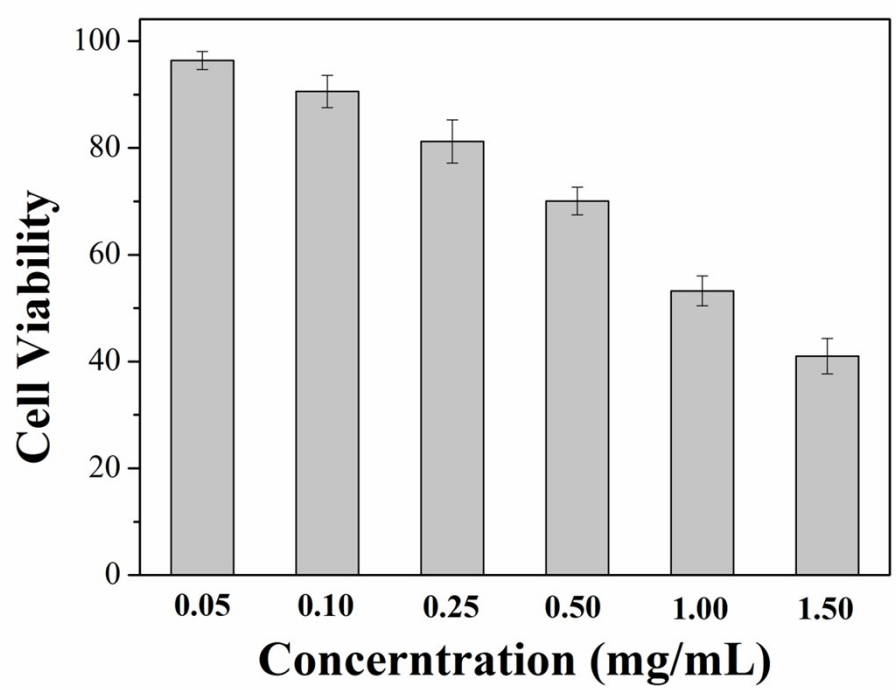

Figure S14. Cell viability of Hela cells at different concentrations of HNTs-PA. The IC_{50} value was calculated as 1.11 mg/mL