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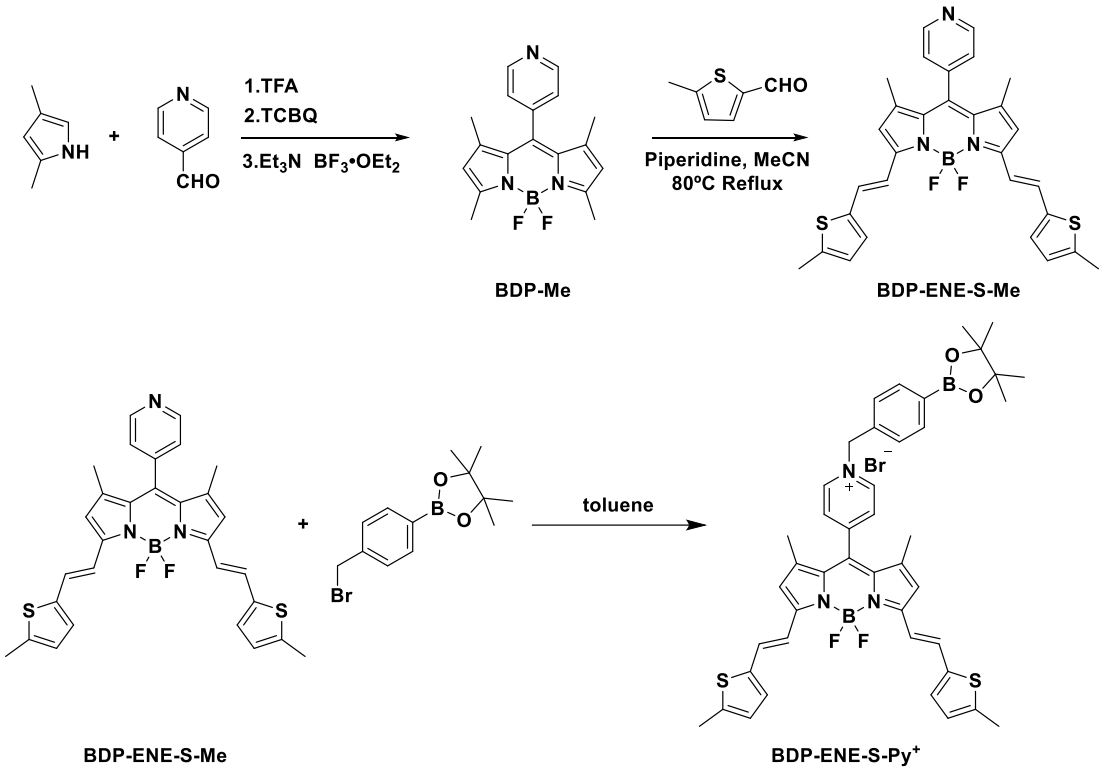
1. Synthesis



Scheme S1. The synthesis routine of **BDP-ENE-S-Py**$^{+}$.

2. Supplementary Date

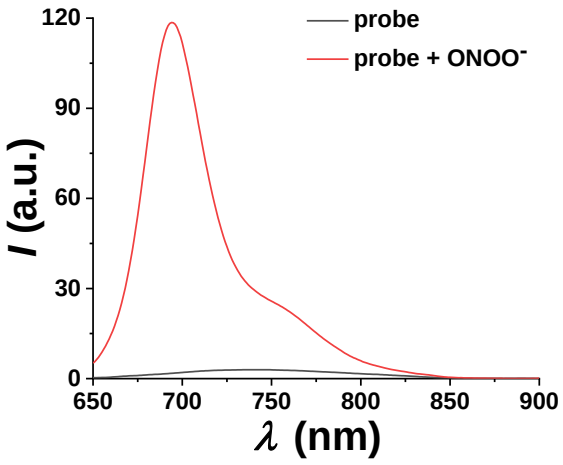


Figure S1. Fluorescence emission spectra of probe **BDP-ENE-S-Py**$^{+}$ (10 μM) before and after reaction with $ONOO^{-}$ (100 μM).

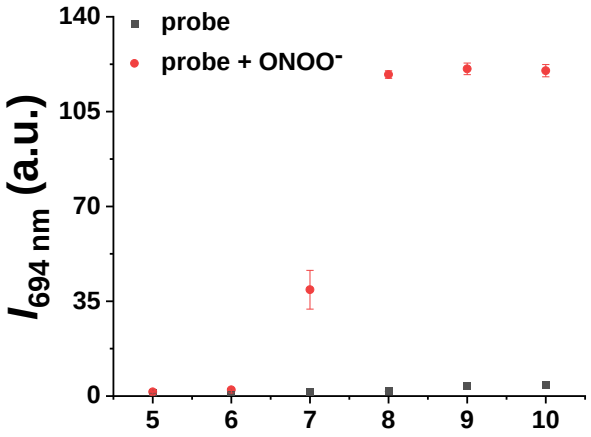


Figure S2. Fluorescence intensity spectra of the probe **BDP-ENE-S-Py**$^{+}$ (10 μM) reacted with $ONOO^{-}$ (100 μM) at different pH values for 2 min. The reaction was carried out in acetonitrile/PBS (1:1, v/v, 10 mM, pH 7.4) at room temperature. λ_{ex} = 630 nm and λ_{em} = 694 nm.

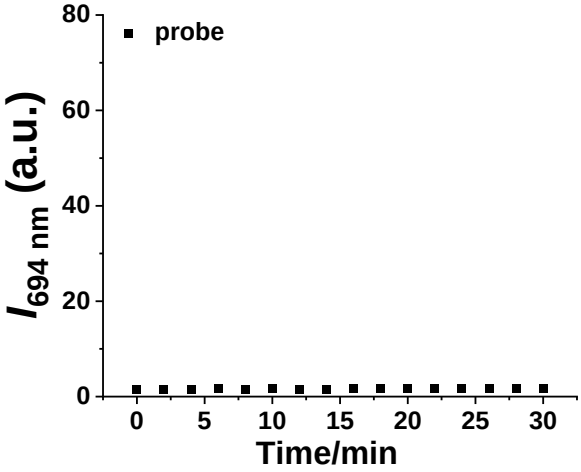


Figure S3. Probe time stability test. The probe **BDP-ENE-S-Py**$^{+}$ (10 μM) was measured in the buffer system every two minutes for 30 minutes. The buffer system was acetonitrile/PBS (1:1, v/v, 10 mM, pH 7.4). λ_{ex} = 630 nm and λ_{em} = 694 nm.

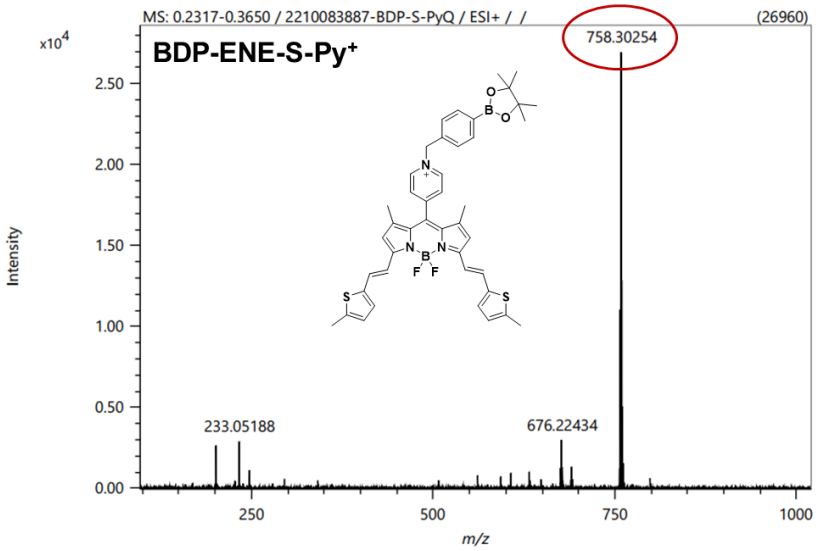


Figure S4. The ESI-MS of BDP-ENE-S-Py$^+$.

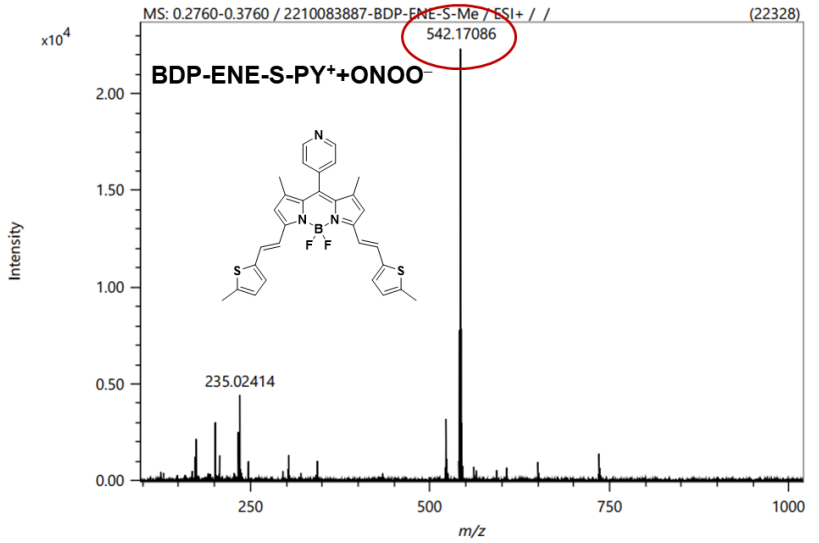


Figure S5. The ESI-MS of **BDP-ENE-S-Py$^+$** upon addition of ONOO$^-$.

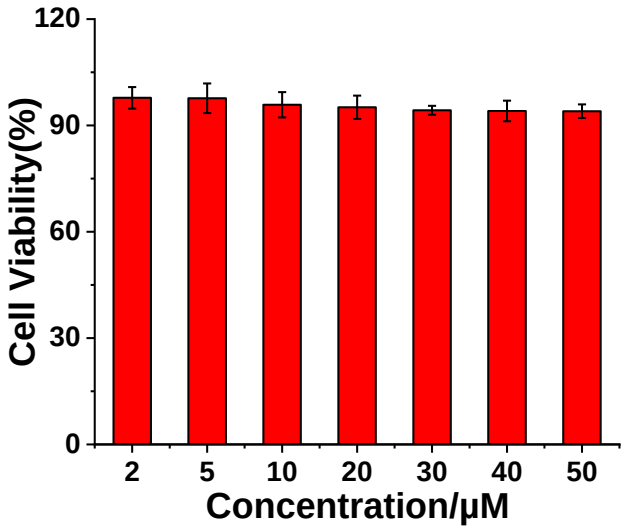


Figure S6. Cytotoxicity assays of **BDP-ENE-S-Py$^+$** in living HepG2 cells.

3. NMR data

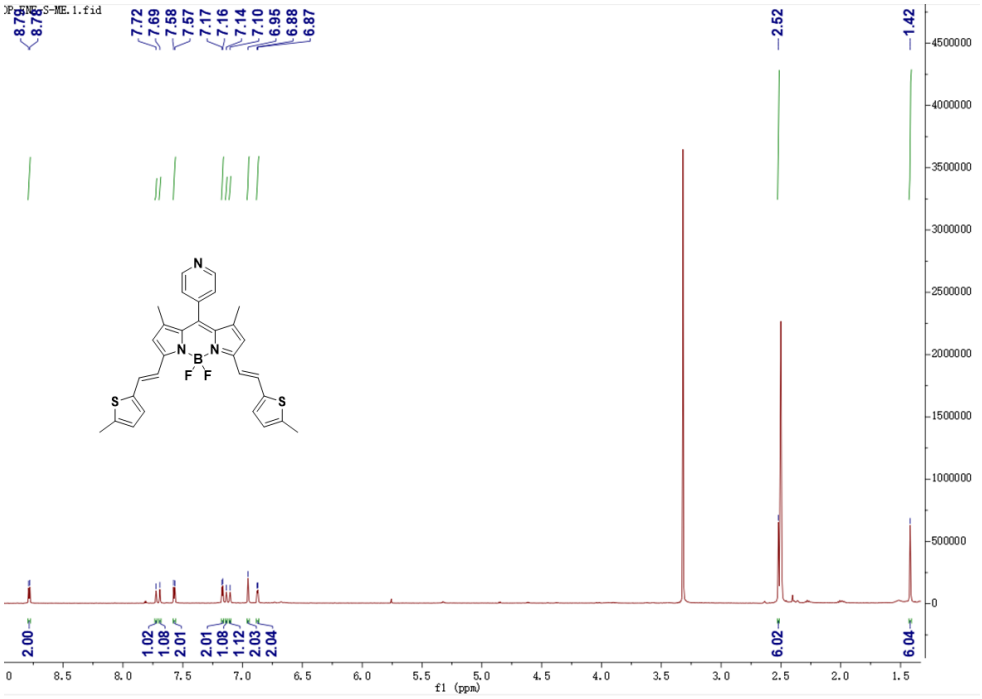


Figure S7. ^{1}H NMR of BDP-ENE-S-Me.

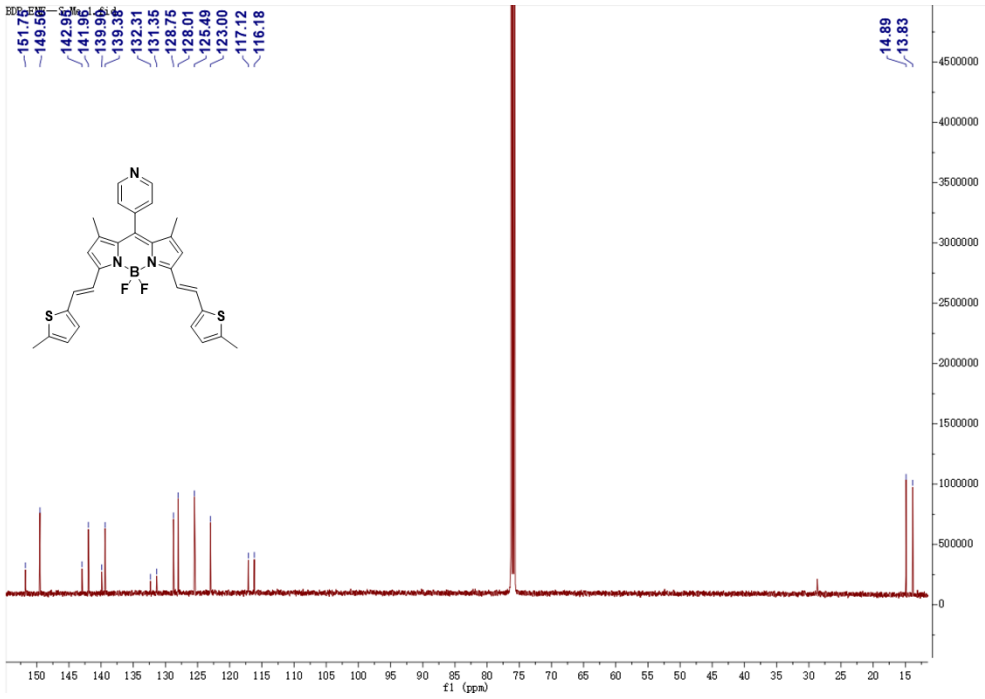


Figure S8. ^{13}C NMR of BDP-ENE-S-Me.

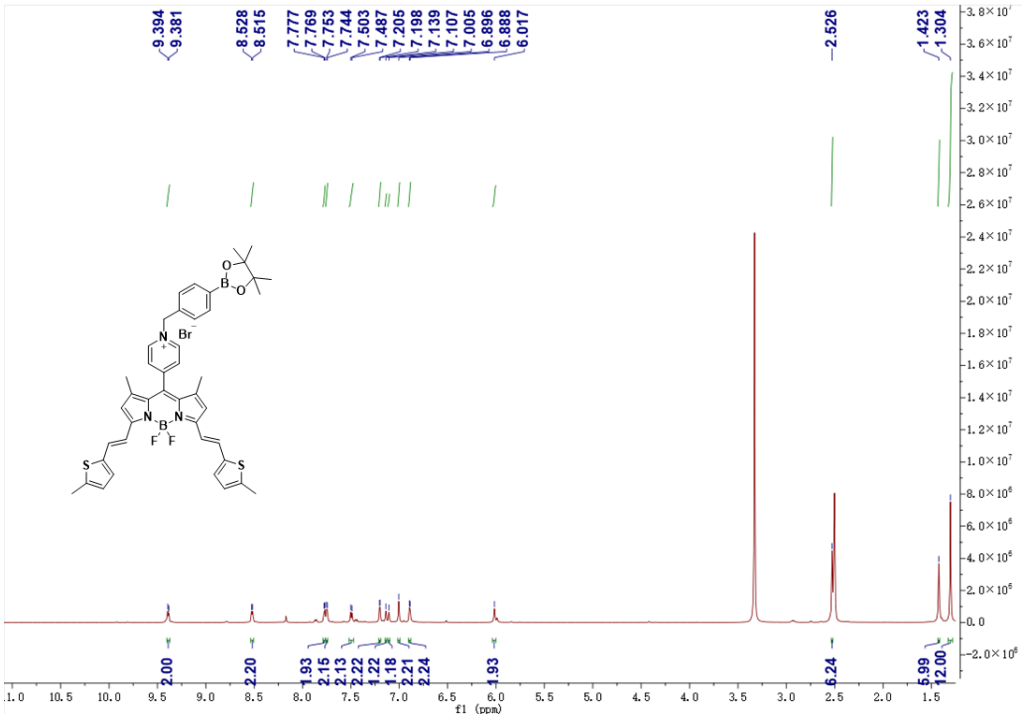


Figure S9. ^{1}H NMR of BDP-ENE-S-Py^{+}.

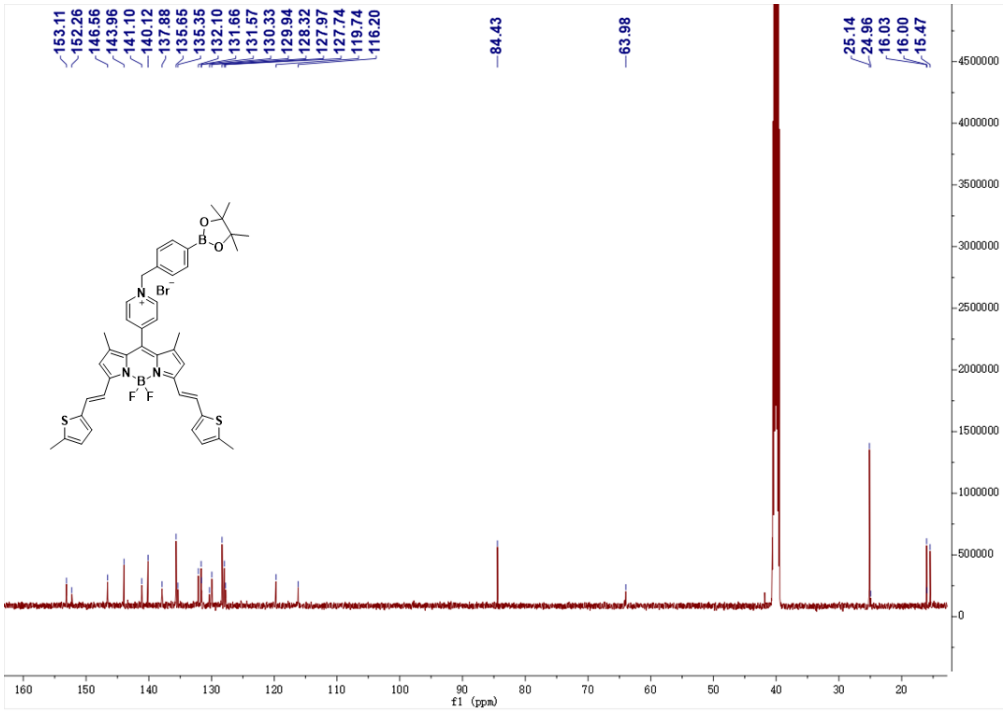


Figure S10. ^{13}C NMR of BDP-ENE-S-Py^{+}.