

Electronic Supplementary Information

for

**A Novel Pyridinium Modified Tetraphenylethene: AIE-activity,
Mechanochromism, DNA Detection and Mitochondria Imaging**

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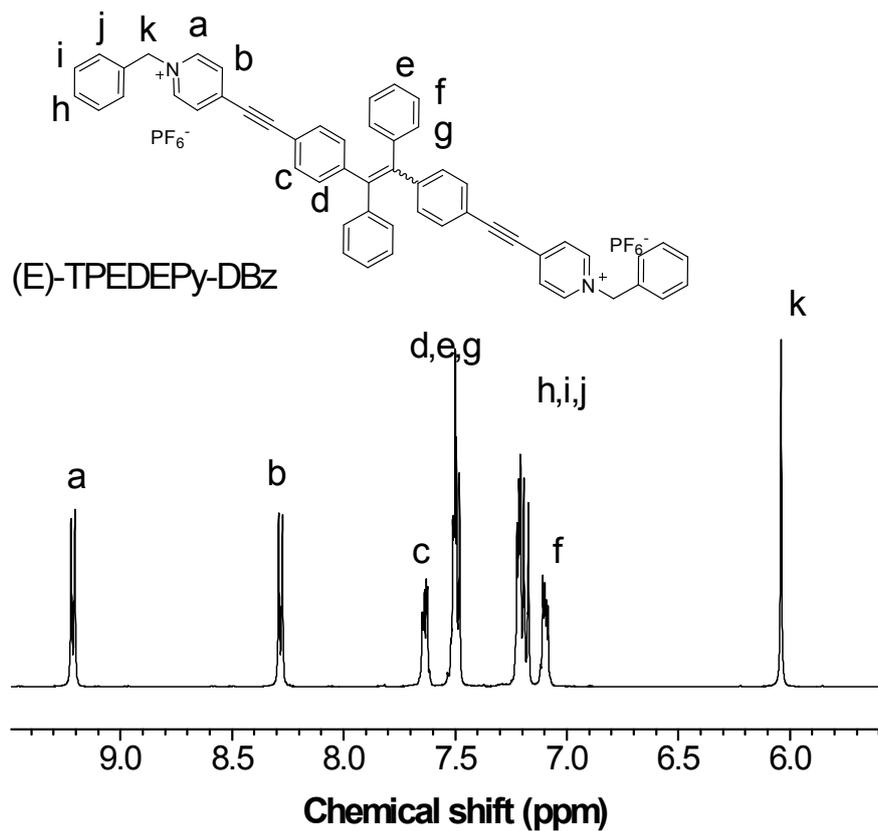


Figure S1 ^1H NMR spectra of (*E*)-TPEDEPy-DBz (*d*-acetone, 400 MHz)

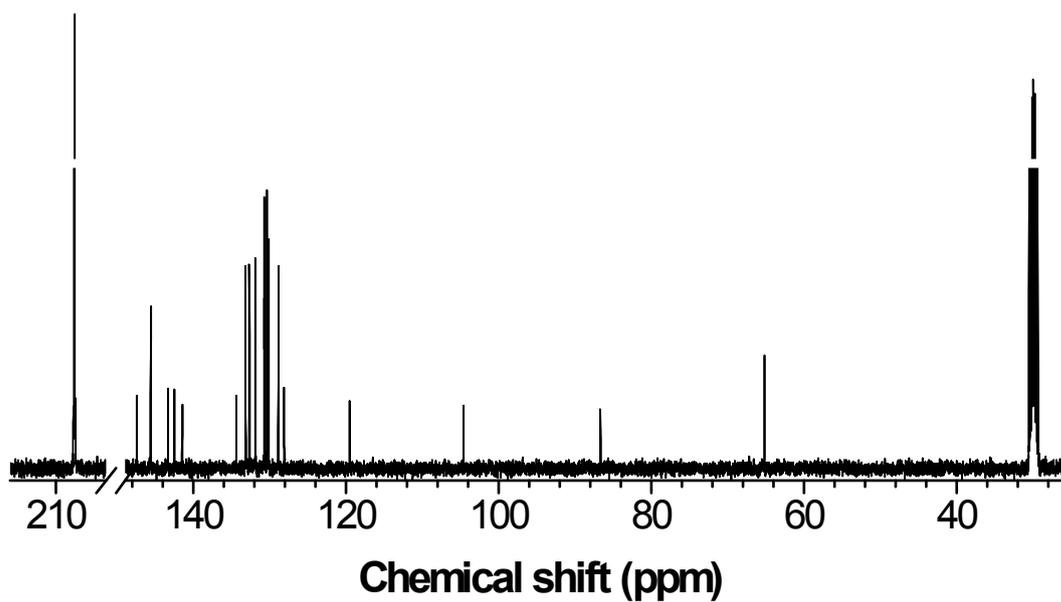
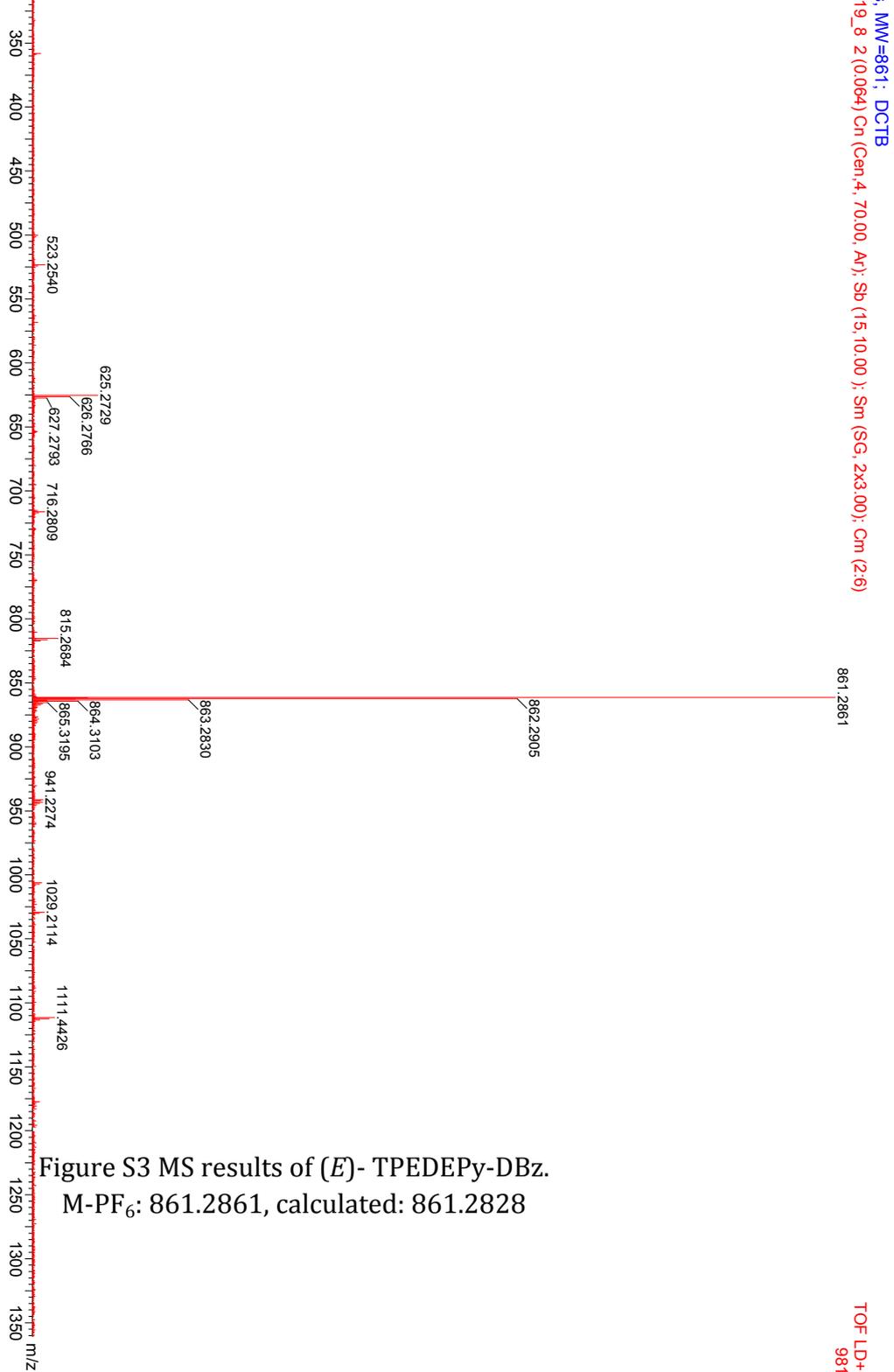


Figure S2 ^{13}C NMR spectra of (*E*)-TPEDEPy-DBz (*d*-acetone, 100MHz)



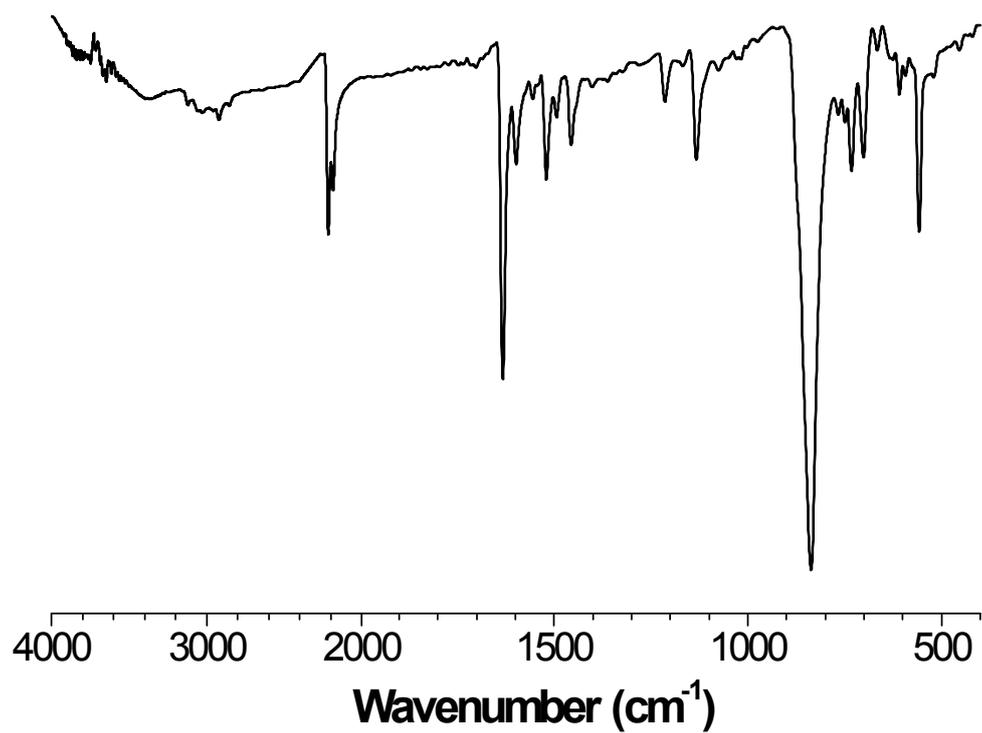


Figure S4 FT-IR spectra of (*E*)-TPEDEPy-DBz in KBr pellet.

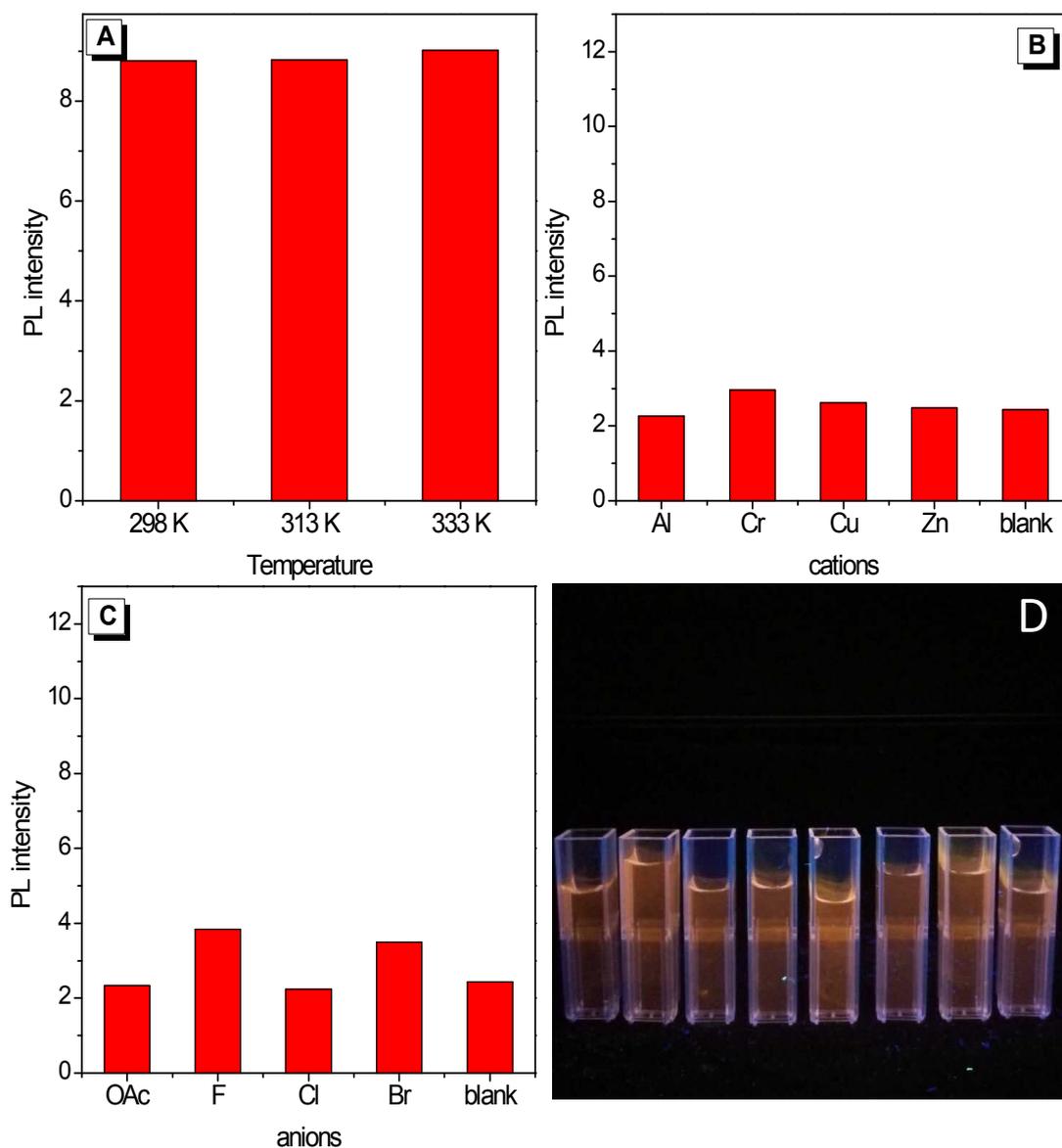


Figure S5 Photoluminescence (PL) intensity of *(E)*-TPEDEPy-2Bz (10^{-5} M, 5% DMSO in water) under different temperatures, slit: 5 nm, 5 nm, $\lambda_{\text{ex}} = 395$ nm (A); with different cations (10^{-4} M), slit: 3 nm, 3 nm, $\lambda_{\text{ex}} = 395$ nm (B); with different anions (10^{-4} M), slit: 3 nm, 3 nm, $\lambda_{\text{ex}} = 395$ nm (C); Fluorescent photographs of trans-TPEDEPy-2Bz with different ions, F⁻, OAc²⁻, Br⁻, Cl⁻, Cr³⁺, Al³⁺, Zn²⁺, Cu²⁺; from left to right, $\lambda_{\text{ex}} = 365$ nm (D). (E) PL spectra of *(E)*-TPEDEPy-2Bz (10^{-5} M, 5% DMSO in water) recorded in a one-month time gap. In this period, the sample was kept in dark at room temperature. Slit: 5 nm, 5 nm, $\lambda_{\text{ex}} = 395$ nm.

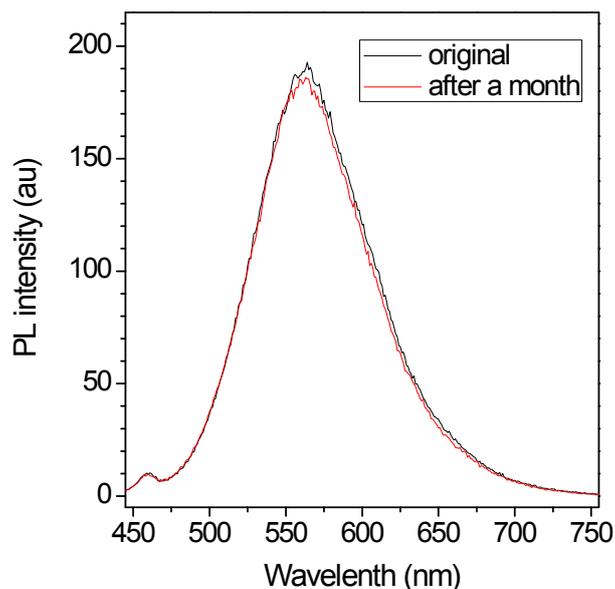


Figure S6 PL spectra of (*E*)-TPEDEPy-2Bz (10^{-5} M, 5% DMSO in water) recorded in a one-month time gap. In this period, the sample was kept in dark at room temperature. Slit: 5 nm, 5 nm, $\lambda_{\text{ex}} = 395$ nm.

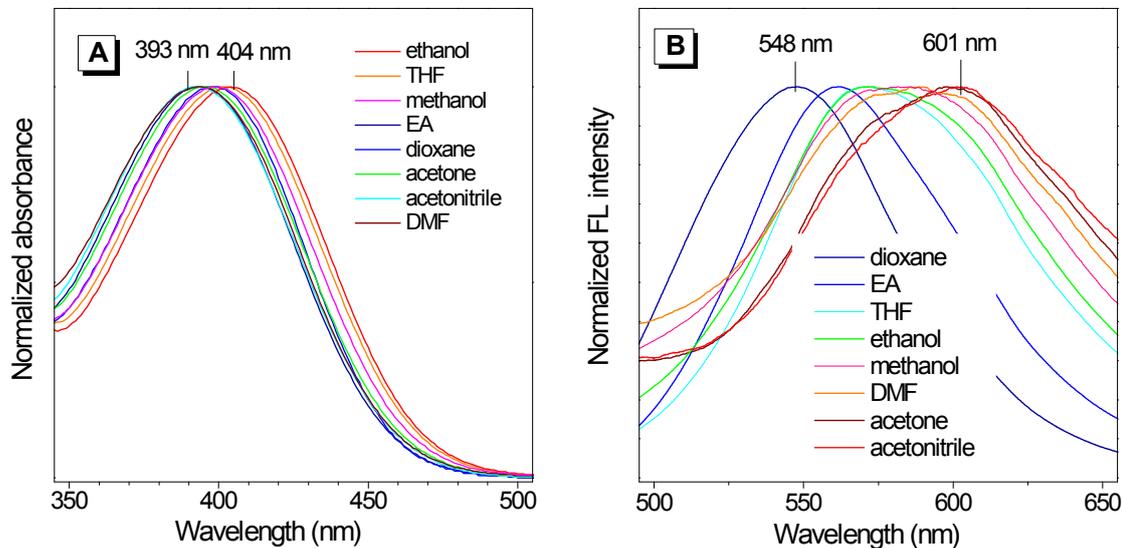


Figure S7 Normalized absorption (A) and FL (B) spectra of (*E*)-TPEDEPy-DBz in different solvents with variation of polarity. THF = tetrahydrofuran, EA = ethyl acetate and DMF = N,N-dimethylformamide, $[M] = 10^{-5}$ mol/L; $\lambda_{\text{ex}} = 395$ nm.

Table S1 Optical Transitions of (*E*)-TPEDEPy-DBz in different solvents including the alcohols.

solvents	<i>(E)</i> - TPEDEPy-DBz			
	Δf	$\lambda_{ab}(nm)$	$\lambda_{em}(nm)$	$\Delta \nu (cm^{-1})$
dioxane	0.021	398	548	6870
EA	0.201	393	562	7645
THF	0.210	401	571	7424
DMF	0.274	393	589	8455
Acetone	0.284	395	598	8599
EtOH	0.288	404	572	7282
MeCN	0.306	392	601	8882
MeOH	0.309	398	582	7931

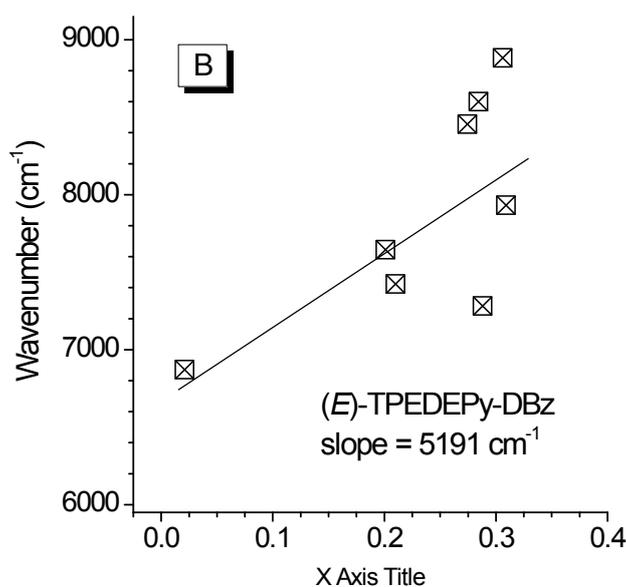
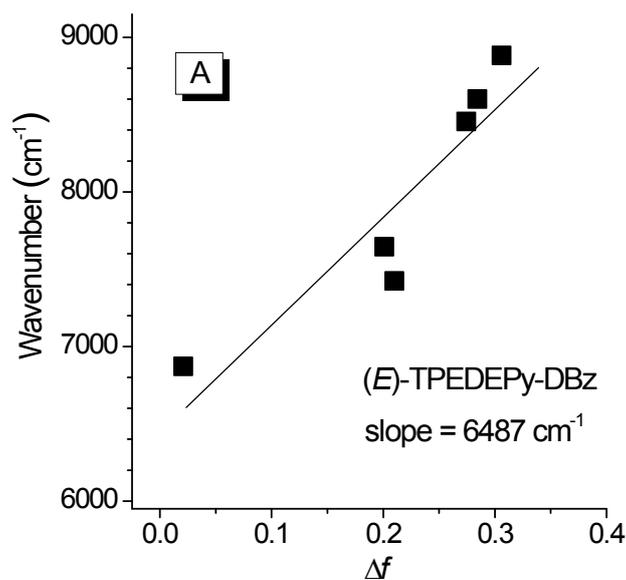


Figure S8 Plot of Stokes shift ($\Delta \nu$) of (E) -TPEDEPy-DBz versus Δf of their solutions excluding (A) and including (B) the protic solvents.

Table S2 Calibration of DNA Concentration by UV-vis Spectroscopy

Sample Number	0	1	2	3	4	5	6	7	8	9	10	11	12
Abs(260)	0	0.020	0.039	0.058	0.082	0.101	0.154	0.209	0.298	0.401	0.601	0.814	0.997
[DNA]/($\mu\text{g/mL}$)	0	1.00	1.95	2.90	4.10	5.05	7.70	10.45	14.90	20.05	30.05	40.70	49.85

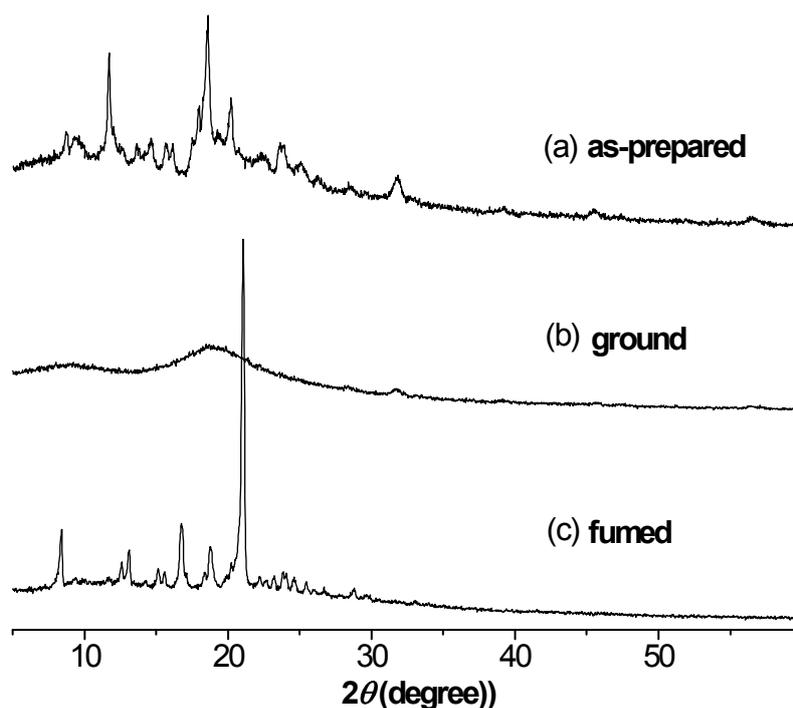


Figure S9 X-ray diffraction patterns for (*E*)-TPEDEPy-DBz solid samples in different states. (a) As-prepared solid; (b) powder sample obtained by grinding the as-prepared solid; (c) the ground powders fumed with acetone vapor for 5 minutes.

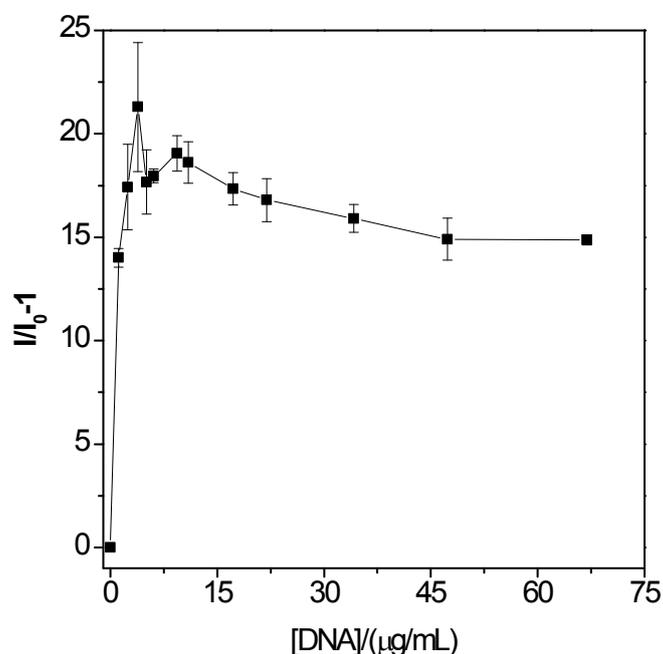


Figure S10 Variation of the relative FL intensity (I/I_0-1) of (*E*)-TPEDEPy-DBz with the addition of different amounts of herring sperm DNA; I and I_0 are fluorescence intensity of (*E*)-TPEDEPy-DBz with and without DNA in the system; $\lambda_{\text{ex}} = 395$ nm.

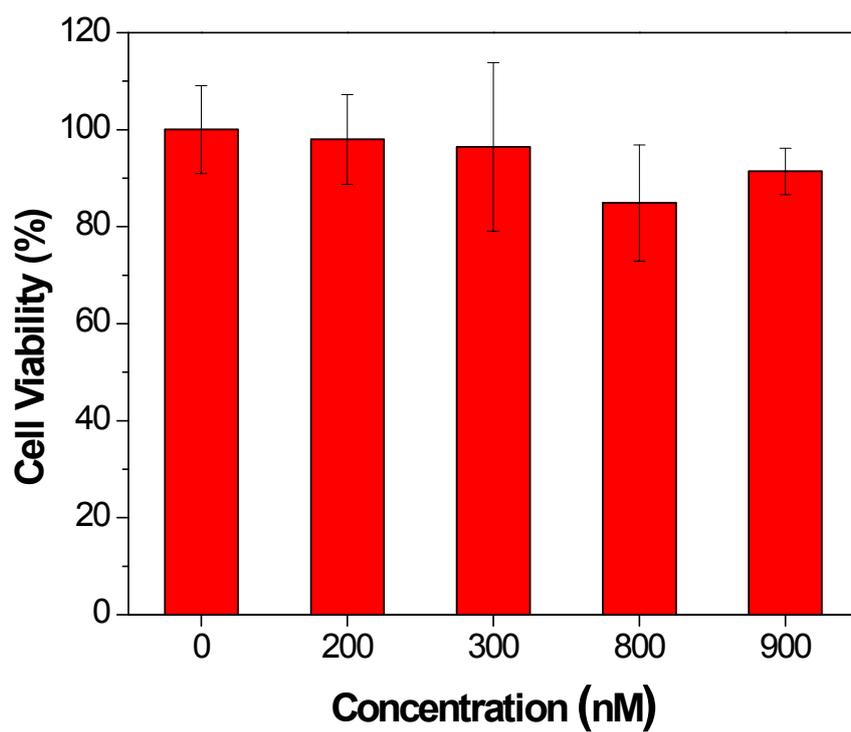


Figure S11 Viability of HeLa cells in the presence of different concentrations of (*E*)-TPEDEPy-DBz for 24 h. Data are expressed as mean value of six separate trials.