

Electronic Supplementary Information (ESI):

A Water-soluble Phosphorescent Polymer for Time-Resolved Assay and Bioimaging of Cysteine/Homocysteine

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1. Low-temperature (77K) photoluminescence spectra of P1 in CH₂Cl₂
2. The excitation spectra of P1.
3. The time-dependent spectra of P1.
4. Changes in the phosphorescence emission spectra of P1.
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1. Low-temperature (77K) photoluminescence spectra of P1

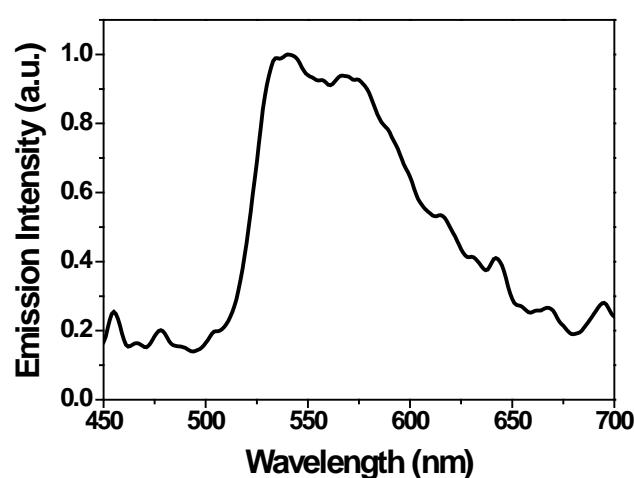


Fig. S1 Low-temperature (77K) photoluminescence spectra of **P1** in CH_2Cl_2 .

2. The excitation spectra of P1

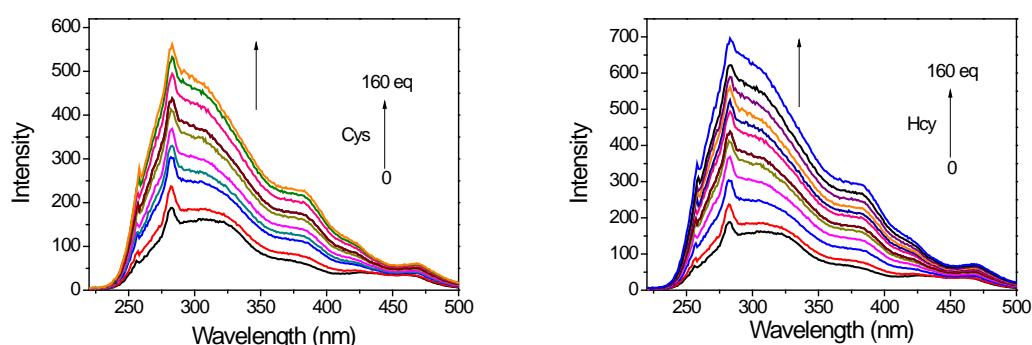


Fig. S2 The excitation spectra of **P1** in the presence of different concentrations of Cys/Hcy in the PBS at 28 °C.

3. The time-depentent spectra of P1

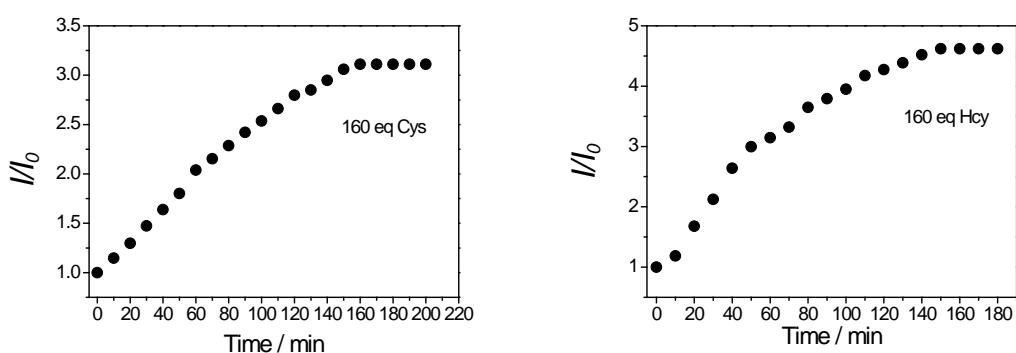


Fig. S3 The time-depentent spectra of **P1** in the presence of 160 eq of Cys/Hcy in the PBS at 28 °C.

4. Changes in the phosphorescence emission spectra of P1

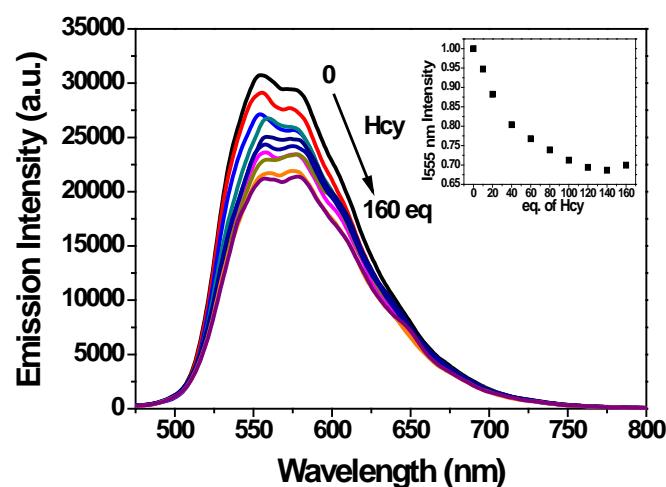


Fig. S4 Changes in the phosphorescence emission spectra of **P1** (20 μM) in PBS at 45°C with different amounts of Hcy (0-160 equiv). Inset: titration curve of P1 with Hcy (0-160 equiv).

5. Relative phosphorescence intensity changes of P1-Hcy

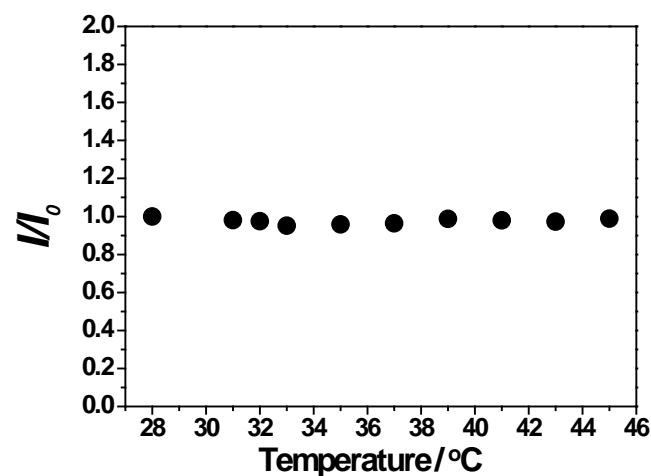


Fig. S5 Relative phosphorescence intensity changes of **P1-Hcy** in the temperature range of 28-45°C.

6. Z-scan images of P1

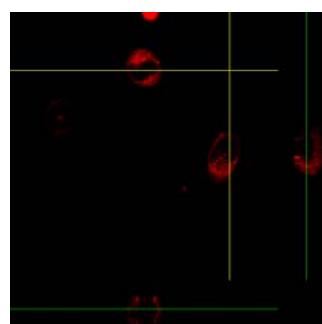


Fig. S6 The overlap Z-scan confocal luminescence image of living KB cells incubated with 50 μM **P1** in PBS for 45 min at 25°C.

7. Confocal luminescence images of P1

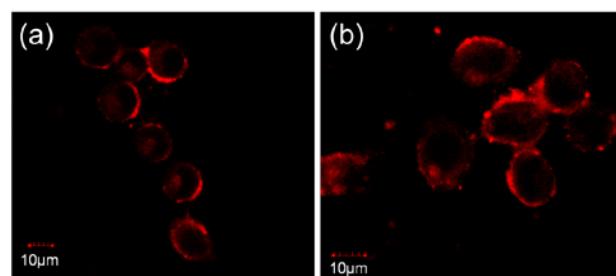


Fig. S7 Confocal luminescence images of living KB cells: cells incubated solely with 50 μM **P1** in PBS for 45 min at (a) 4°C and (b) 25°C.

8. Confocal luminescence images of P2

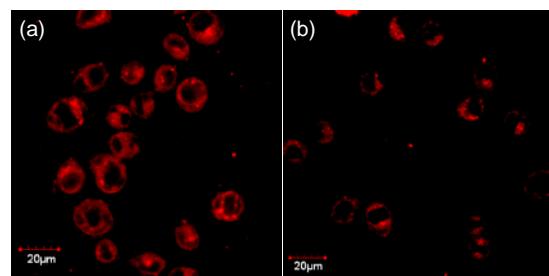


Fig. S8 Confocal luminescence images of living KB cells: cells incubated solely with 50 μM **P2** in PBS for 45 min at (a) 25°C and (b) 37°C.

9. Photophysical Properties of P1

Table S1. Photophysical Properties of **P1**

polymer	solvent	λ_{abs} , nm ($\log \varepsilon$)	$\lambda_{PL}(298K)$, nm	$\lambda_{PL}(77K)$, nm	Φ_{em}	τ , ns
P1	CH ₂ Cl ₂		532	541max, 567	0.141	810
	EtOH		552		0.051	296
	PBS	276(4.77), 380(3.91)sh, 419(3.70)sh	564		0.023	366

10. Calculation results of M1 and M1-Cys

Table S2. Calculated excited triplet states, emission wavelength, dipole, character of the transitions for **M1** and **M1-Cys**

Complex	State	λ_{cal} , nm ^a	E_{cal} , eV	μ_{cal} , D	Main configuration(CI coeff)	character
M1	T ₁	543	2.28	12.70	HOMO→LUMO(0.62) HOMO-1→LUMO(0.27)	³ MLCT/LLCT
	T ₁	585	2.12	9.28	HOMO→LUMO(0.70)	³ MLCT/LLCT
M1-Cys						

^aCalculated in water solution