Electronic Supplementary Information for

An Amphiphilic Conjugated Polymer as an Aggregation-Based Multifunctional Sensing Platform with Multicolor Fluorescence Response

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1. FTIR data.

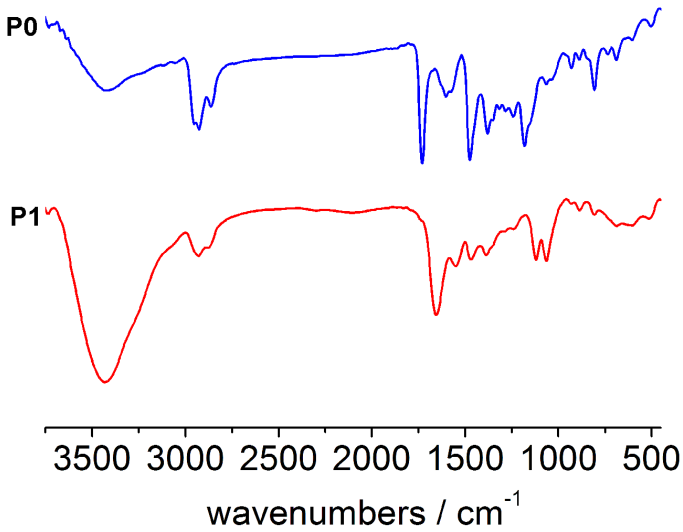

Figure S1. FTIR spectra of **P0** and **P1**.

2. UV-visible Absorbance Analysis.

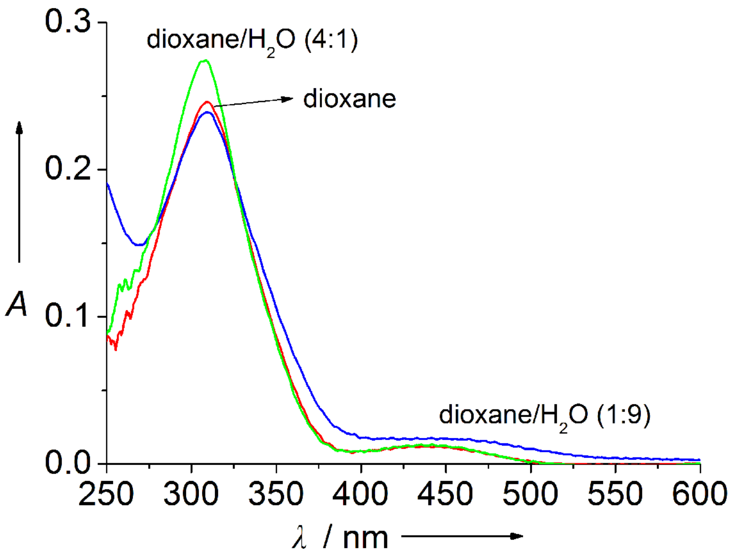

Figure S2. UV-vis absorbtion spectra of **P1** in dioxane, dioxane/H_2O (4:1), and dioxane/H_2O (1:9). [**P1**] = 8.0×10^{-6} M.

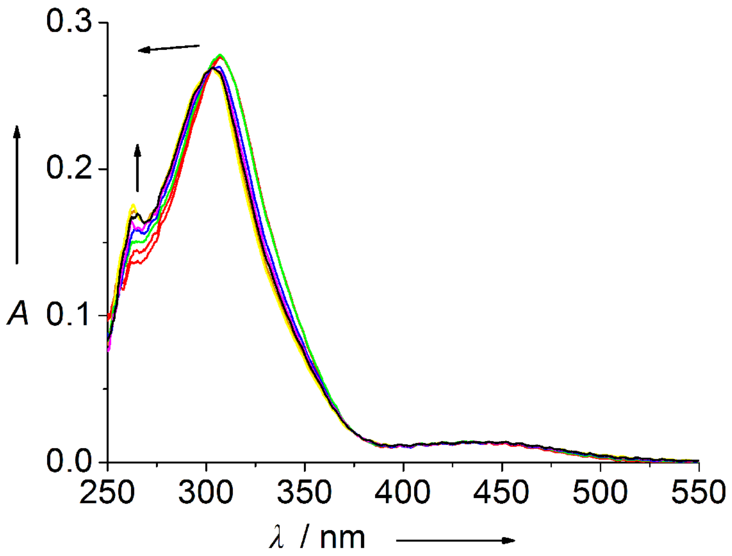

Figure S3. UV-vis absorbtion spectra of **P1** in dioxane/H_2O (4:1) mixed solvents change with increasing the concentration of Ag^+ ions (0-6.25 equiv). [**P1**] = 8.0×10^{-6} M.

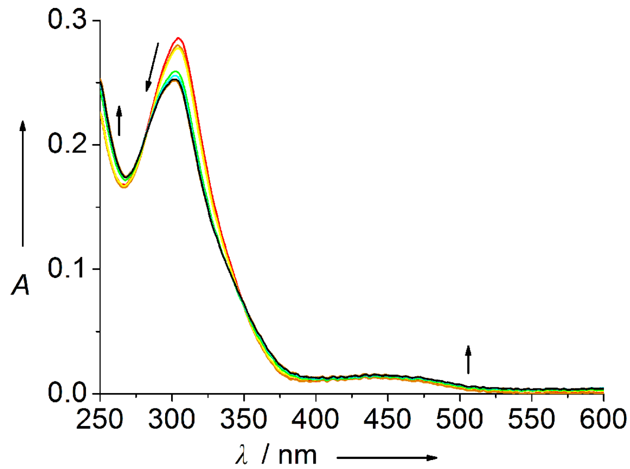

Figure S4. UV-vis absorbtion spectra of **P1** in dioxane/H_2O (4:1) mixed solvents change with increasing the concentration of Hg^{2+} ions (0-6.25 equiv). [**P1**] = 8.0×10^{-6} M.

3. Polymerization Results.

Table S1. Polymerization Results and Characterization of **P0** and **P1**

Polymer	M_w [a]	M_n [a]	PDI[a]	Absorbance[b] (λ_{max}, nm)	Emission[b] (λ_{max}, nm)	Quantum[c] Yield
P0	11600	10700	1.09	310, 450	416, 560	0.17
P1	17836	15015	1.20	308, 438	420, 560	0.12

[a] Estimated from GPC (eluent: DMF, polystyrene standards). [b] All spectra were recorded in dioxane at a concentration of polymer-bound biimidazole of 8.0 μM. Emission spectra were measured with excitation at 338 nm. [c] The quantum yields of **P0** and **P1** were determined using Quinine bisulfate in 0.05 M H_2SO_4 solution as the standard.

4. DLS.

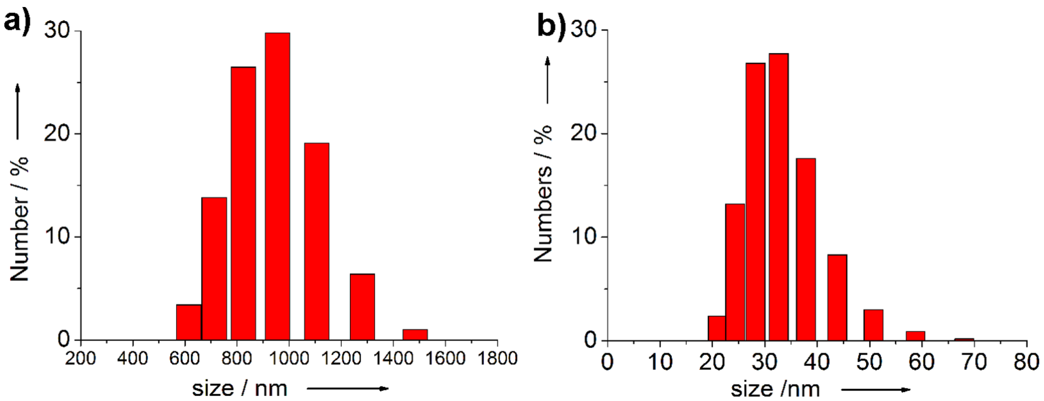

Figure S5. Hydrodynamic radius distribution of **P1** in (a) dioxane and (b) dioxane/H_2O (1:9). [**P1**] = 8.0×10^{-5} M.

5. SEM.

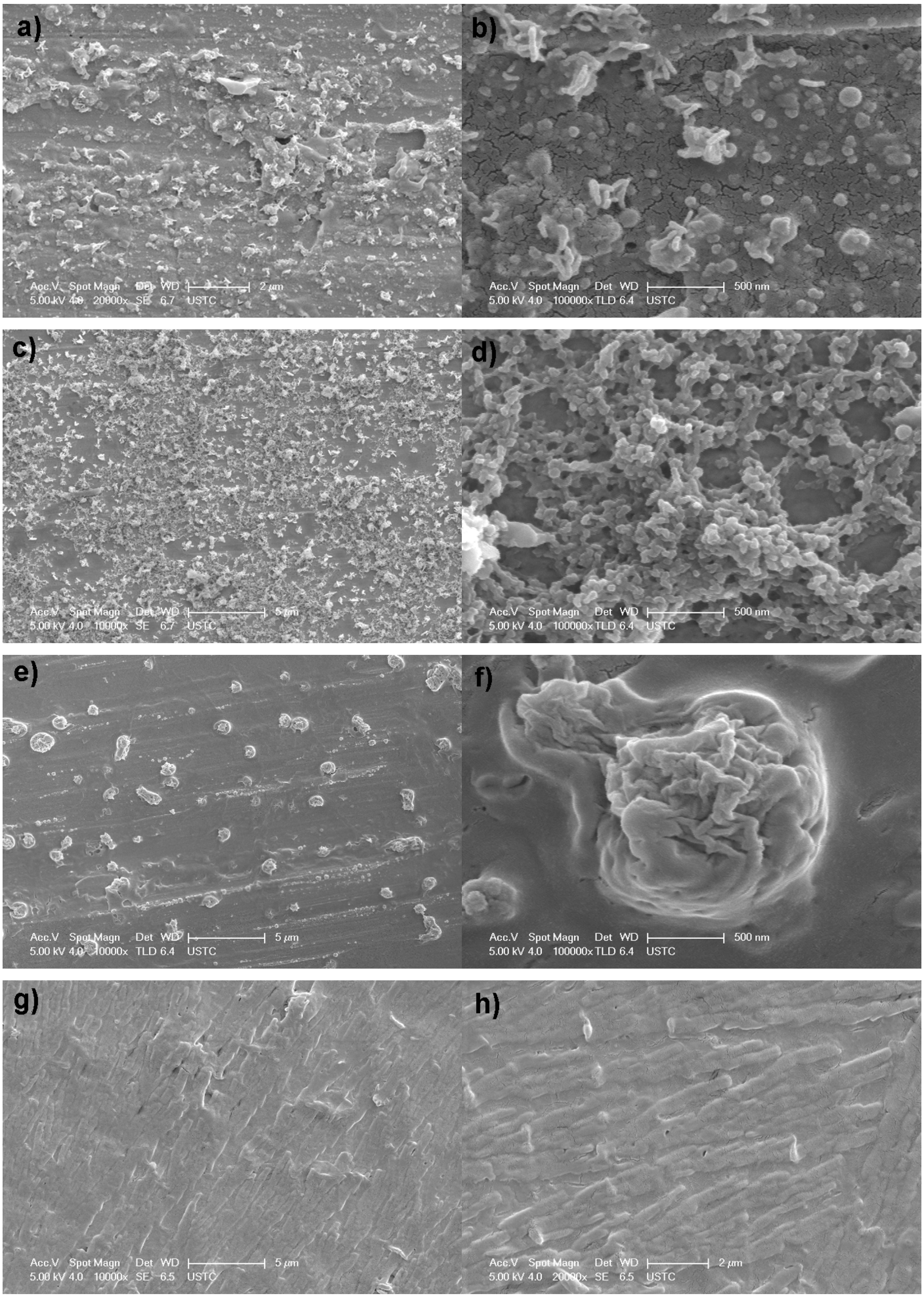

Figure S6. SEM images of **P1**. a) and b): in dioxane; c) and d): in dioxane/H_2O (1:9); e) and f): interaction with 2.5 equiv Ag^+ ions in dioxane/H_2O (4:1); g) and h) interaction with 2.5 equiv Hg^{2+} ions in ethanol/H_2O (4:1). [**P1**] = 8.0×10^{-5} M.

6. Fluorometric Analysis.

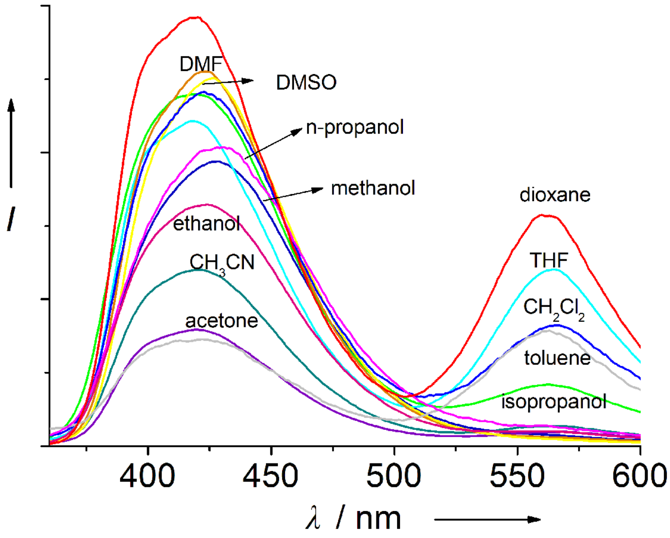

Figure S7. Fluorescence spectra of **P1** in various organic solvents. [**P1**] = 8.0 × 10^{-6} M.

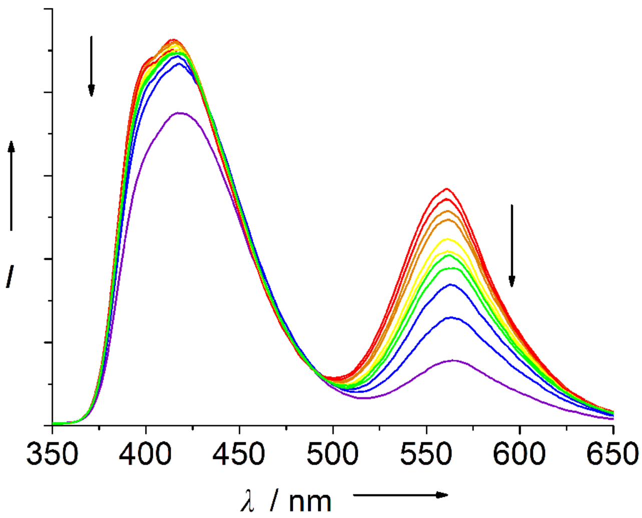

Figure S8. Fluorescence spectra and of **P0** in dioxane-H_2O mixed solvents change with increasing water contents (0-20%). λ_{ex} = 338 nm. [**P0**] = 8.0 × 10^{-6} M.

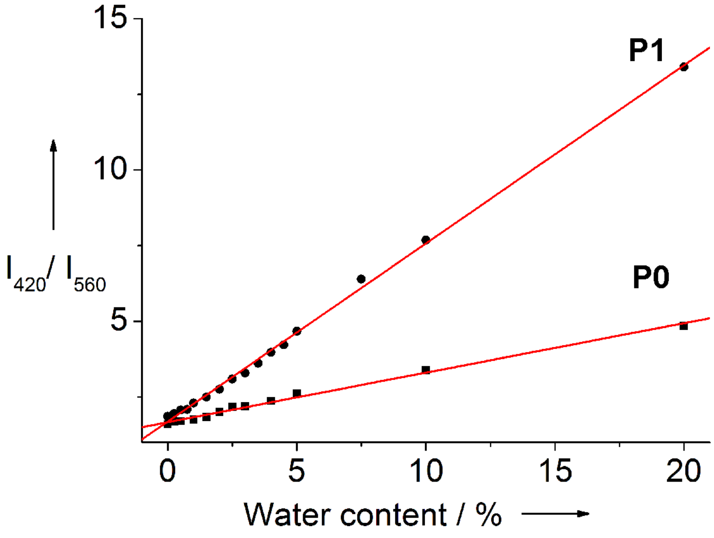

Figure S9. Emission intensity ratios I_{420nm}/I_{560nm} of **P0** and **P1** in dioxane-H_2O mixed solvents change with increasing water contents. λ_{ex} = 338 nm (0-20%). [**P0**] = [**P1**] = 8.0×10^{-6} M.

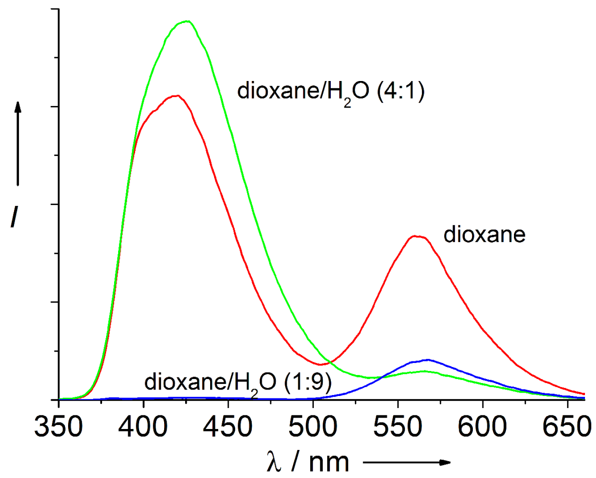

Figure S10. Fluorescence spectra of **P1** in dioxane, dioxane/H_2O (4:1), and dioxane/H_2O (1:9). λ_{ex} = 338 nm. [**P1**] = 8.0×10^{-6} M.

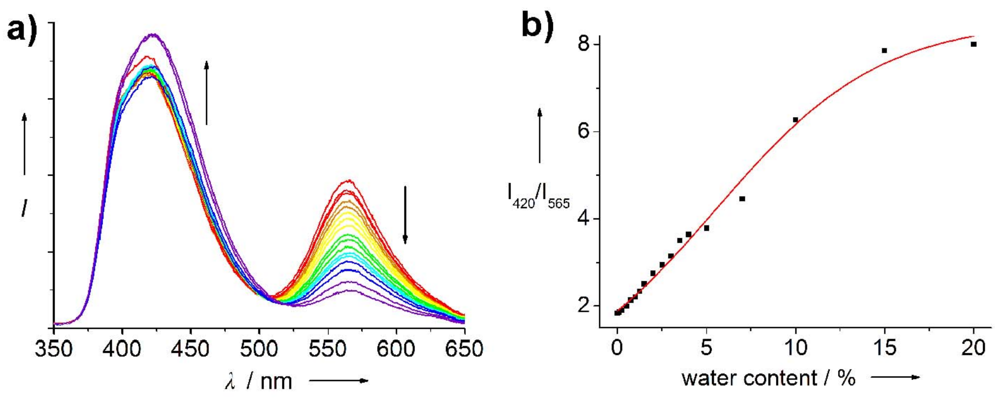

Figure S11. (a) Fluorescence spectra and (b) emission intensity ratios I_{420nm}/I_{565nm} of **P1** in THF-H_2O mixed solvents change with increasing water contents (0-20%). λ_{ex} = 338 nm. [**P1**] = 8.0 × 10^{-6} M.

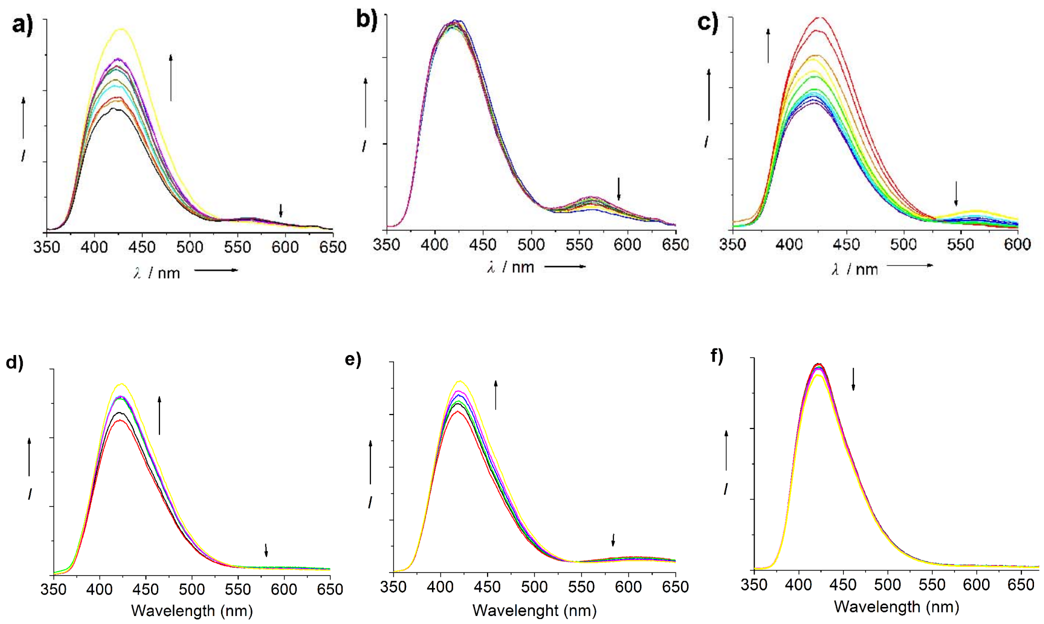

Figure S12. Fluorescence spectra of **P1** in (a) CH_3CN-H_2O (b) isopropanol-H_2O (c) n-propanol-H_2O (d) methanol-H_2O (e) ethanol-H_2O (f) DMSO-H_2O mixed solvents change with increasing water contents (0-15% for a,b,c and 0-10% for d,e,f). λ_{ex} = 338 nm. [**P1**] = 8.0 × 10^{-6} M.

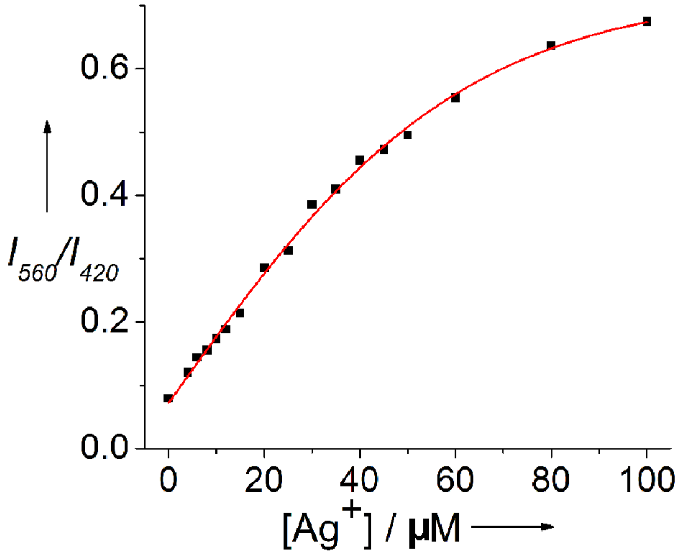

Figure S13. Intensity ratio I_{560}/I_{420} of **P1** (8.0 μM) in MES (0.01 M) solution (dioxane/H_2O = 4:1, v/v, pH 6.0) as a function of Ag^+ concentration. λ_{ex} = 338 nm.

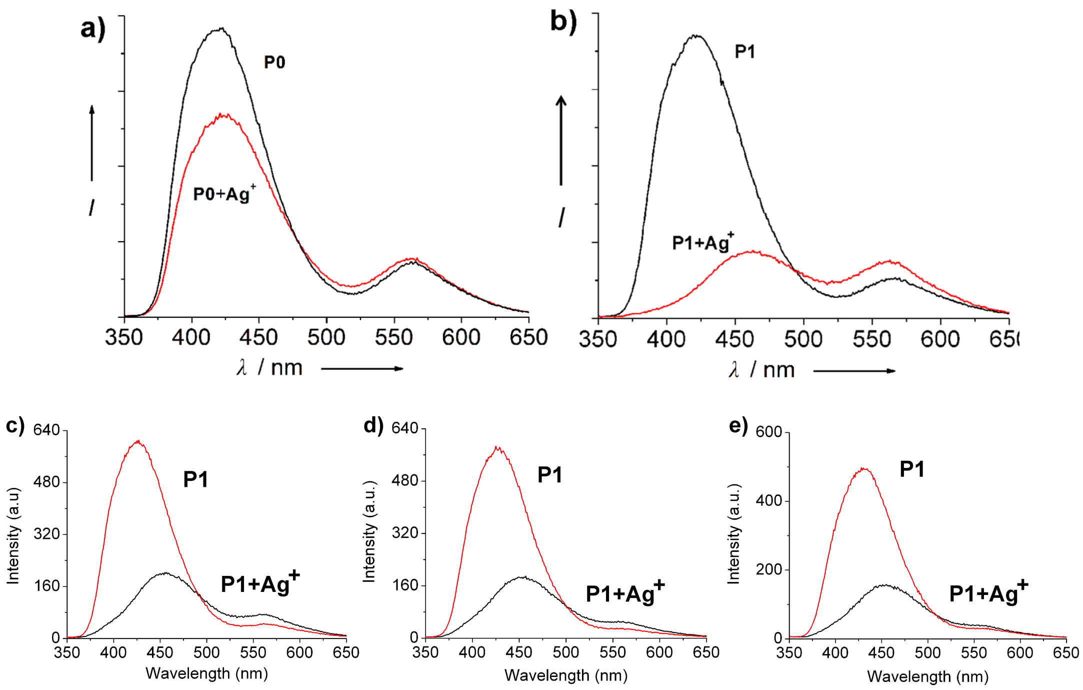

Figure S14. Fluorescence spectra of (a) **P0** and (b) **P1** in dioxane/H_2O (4:1), (c) **P1** in dioxane/H_2O (7:3), (d) **P1** in dioxane/H_2O (6:4), (e) **P1** in dioxane/H_2O (5:5) before and after interaction with 40 μM Ag^+ ions. λ_{ex} = 338 nm. [**P0**] = [**P1**] = 8.0×10^{-6} M.

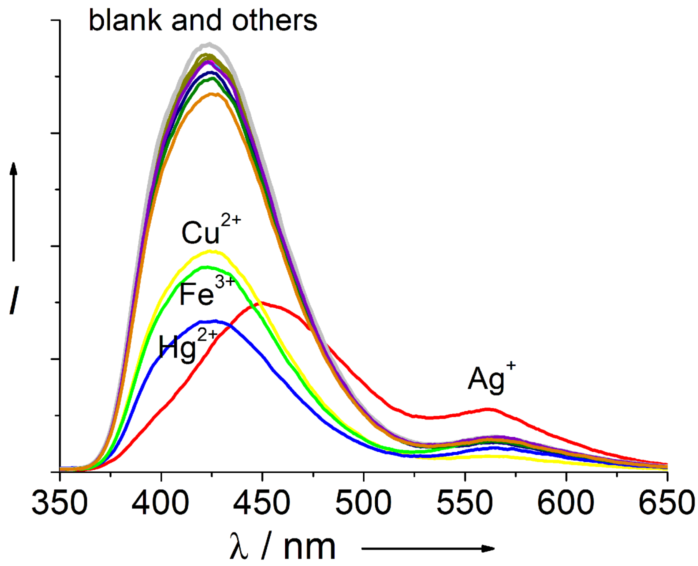

Figure S15. Fluorescence spectra of of **P1** (8.0 μM) in MES (0.01 M) solution (dioxane/H_2O = 4:1, v/v, pH 6.0) in the presence 10.0 equiv of various metal ions. λ_{ex} = 338 nm.

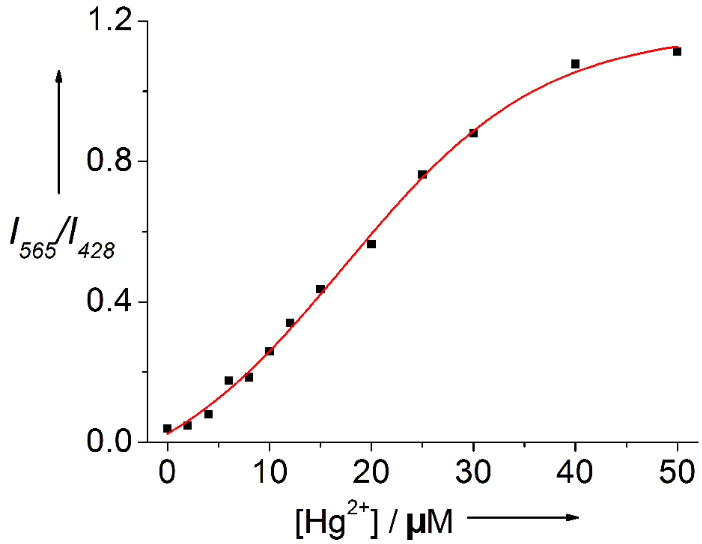

Figure S16. Intensity ratio I_{565}/I_{428} of **P1** (8.0 μM) in MES (0.01 M) solution (ethanol/H_2O = 4:1, v/v, pH 6.0) as a function of Hg^{2+} concentration. λ_{ex} = 338 nm.

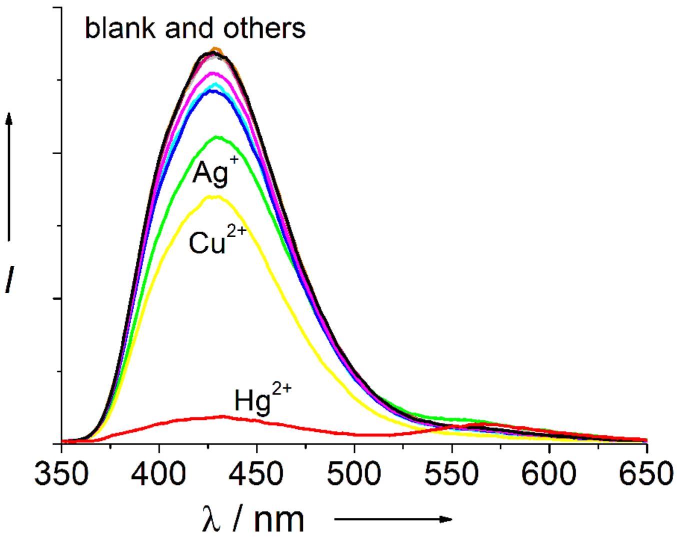

Figure S17. Fluorescence spectra of of **P1** (8.0 μM) in MES (0.01 M) solution (ethanol/H_2O = 4:1, v/v, pH 6.0) in the presence 10.0 equiv of various metal ions. λ_{ex} = 338 nm.

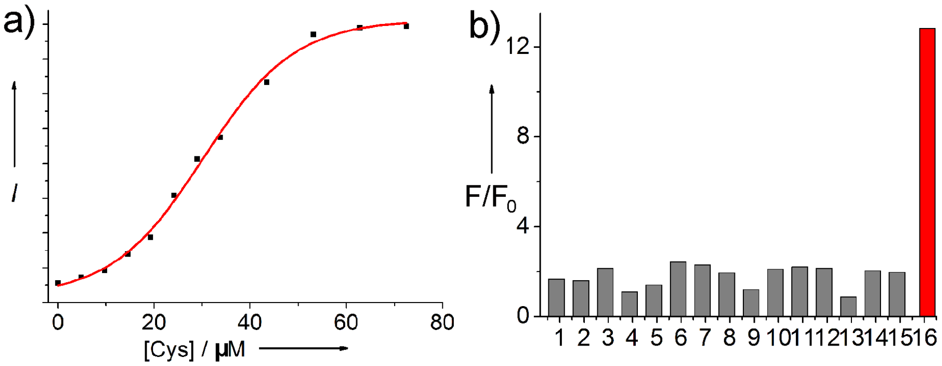

Figure S18. a) Intensity of **P1**-Hg^{2+} (8.0 μM) in MES (0.01 M) solution (ethanol/H_2O = 4:1, v/v, pH 6.0) as a function of Cys concentration. b) Selectivity profiles in the presence of 10 equiv various amino acids. 1, Gly; 2, Pro; 3, Trp; 4, Ser; 5, Phe; 6, Ala; 7, Lys; 8, Tyr; 9, Ile; 10, Gly; 11, Hyp; 12, Thr; 13, Met; 14, Asp; 15, Val; 16, Cys. λ_{ex}=338 nm.

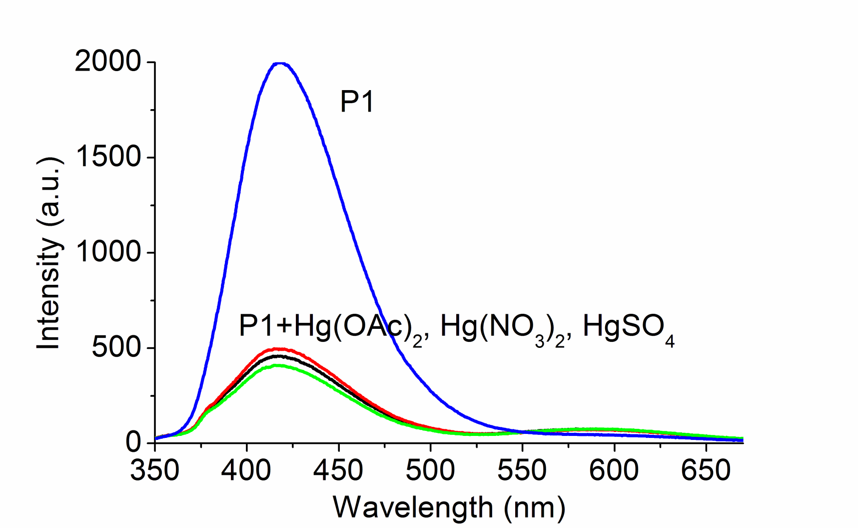

Figure S19. Fluorescence spectra of of **P1** (8.0 μM) in MES (0.01 M) solution (ethanol/H_2O = 4:1, v/v, pH 6.0) in the presence 5.0 equiv of different Hg^{2+} salts. λ_{ex} = 338 nm.

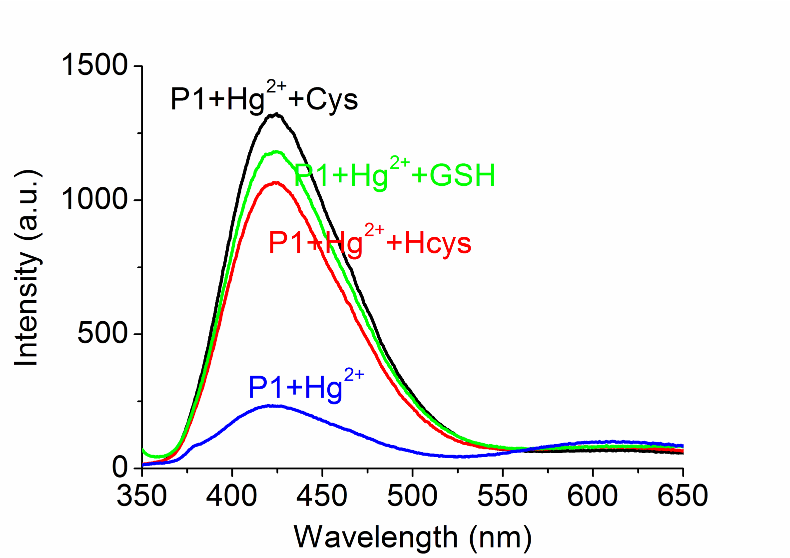

Figure S20. Fluorescence spectra of of **P1**-Hg^{2+} (8.0 μM) in MES (0.01 M) solution (ethanol/H_2O = 4:1, v/v, pH 6.0) in the presence 8.0 equiv of Cys, Hcys, and GSH. λ_{ex} = 338 nm.