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## Supporting information

## Deciphering the liaison of CHEF-PET-ESIPT mechanism in a Zn<sup>2+</sup>chemosensor and its applications in cell imaging study

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Figure S1. Mass of the Chemosensor (L)



Figure S2. Proton NMR of the Chemosensor (L)



Figure S3. Mass Spectrum of the L-Zn<sup>2+</sup> complex.



Figure S4. IR spectrum of the L



**Figure S5.** IR spectrum of the L-Zn<sup>2+</sup> complex.



Figure S6. Image under UV light (365 nm)



**Figure S7.** Benesi-Hildebrand plot of L (40  $\mu$ M) for Zn<sup>2+</sup> determined by fluorescence method in a HEPES buffer [50  $\mu$ M, DMSO:water=1:9 (v/v), pH=7.2] at 25°C



**Figure S8.** Job's plot of Fluorescence intensity at 495 nm of L and  $Zn^{2+}$  with a total concentration of 20  $\mu$ M cations in a HEPES buffer [50  $\mu$ M, DMSO:water=1:9 (v/v), pH=7.2] at 25°C



**Figure S9.** The limit of detection (LOD) and limit of quantification (LOQ) were calculated using  $3\sigma/S$  and  $10\sigma/S$  methods, respectively.  $\sigma$  = the standard deviation of y-intercept of regression line, S = the slope of the calibration curve.



Figure S10. Effect of pH on the Chemosensor L (40  $\mu$ M)



**Figure S11.** Emission spectral changes of L-Zn<sup>2+</sup>complex (40  $\mu$ M) upon addition of EDTA in a HEPES buffer [50  $\mu$ M, DMSO:water=1:9 (v/v), pH=7.2] at 25°C.EDTA = 0-80  $\mu$ M.



**Figure S12.** UV-Vis spectrum of L (40  $\mu$ M) taken in different solvents in a HEPES buffer [50  $\mu$ M, DMSO:water=1:9 (v/v), pH=7.2] at 25°C. Black curve = EtOH; Red curve = DMF; Blue curve = DMSO.



**Figure S13.** UV-Vis spectrum of  $L-Zn^{2+}$  complex (40  $\mu$ M) taken in different solvents in a HEPES buffer [50  $\mu$ M, DMSO:water = 1:9 (v/v), pH=7.2] at 25°C. Black curve = EtOH; Red curve = DMF; Blue curve = DMSO.



**Figure S14.** Fluorescence spectrum of Chemosensor L (40  $\mu$ M) as well as theL-Zn<sup>2+</sup>Complex taken in different solvents in a HEPES buffer [50  $\mu$ M, DMSO:water=1:9 (v/v), pH=7.2] at 25°C. Black curve = L (in DMF), Blue curve = L (in DMSO) Pink curve = L (in EtOH); Red curve = L-Zn<sup>2+</sup> (in DMF), Green curve = L-Zn<sup>2+</sup> (in DMSO) yellowish green curve = L-Zn<sup>2+</sup> (in EtOH).