

## Supporting information

### **Functionalized Lanthanide Coordination Polymers Nanoparticles for Selective Sensing of Hydrogen Peroxide in Biological Fluids**

Hongliang Tan\*, Chanjiao Ma, Qian Li, Li Wang, Fugang Xu, Shouhui Chen, Yonghai Song\*

Key Laboratory of Functional Small Organic Molecule, Ministry of Education, Key Laboratory of  
Chemical Biology, Jiangxi Province, College of Chemistry and Chemical Engineering, Jiangxi  
Normal University, Nanchang, 330022, P R China

\*Corresponding author: E-mail: [hltan@jxnu.edu.cn](mailto:hltan@jxnu.edu.cn) (H. Tan); [yhsong@jxnu.edu.cn](mailto:yhsong@jxnu.edu.cn) (Y. Song)

Tel/Fax: +86 791 88120861

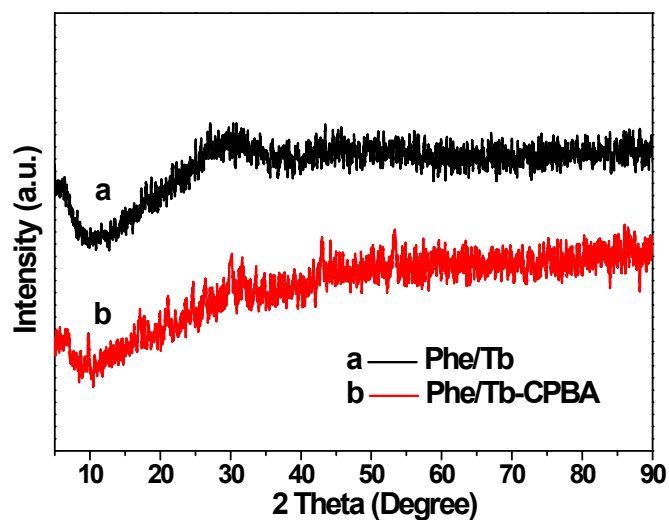
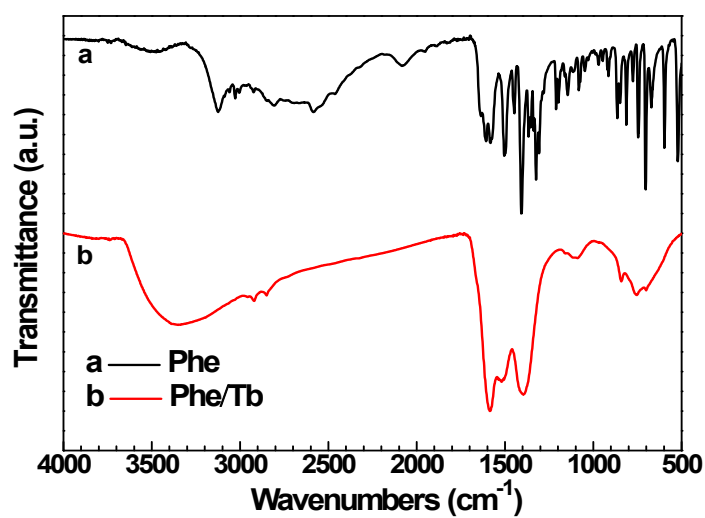


Figure S1. Typical XRD patterns of coordination polymers Phe/Tb CPNPs (a) and Phe/Tb-CPBA CPNPs (b).



Changes of wavenumbers in FTIR spectra <sup>1,2</sup>

Assignments	Phe (cm <sup>-1</sup> )	Phe/Tb(cm <sup>-1</sup> )
NH <sub>3</sub> <sup>+</sup> asymmetric bending	1618	
C=O asymmetric stretching	1596	1577
NH <sub>2</sub> symmetric stretching	1494	1519
C-N symmetric stretching	1075	1096
NH <sub>3</sub> <sup>+</sup> rocking	856	843

Figure S2. FTIR spectra of pure Phe (a) and Phe/Tb CPNPs (b).

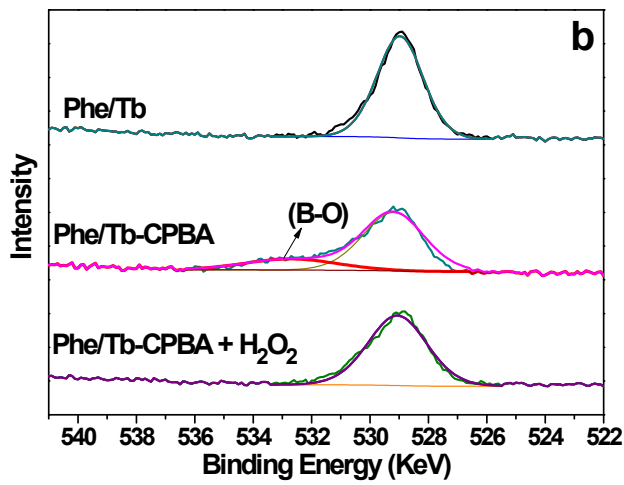
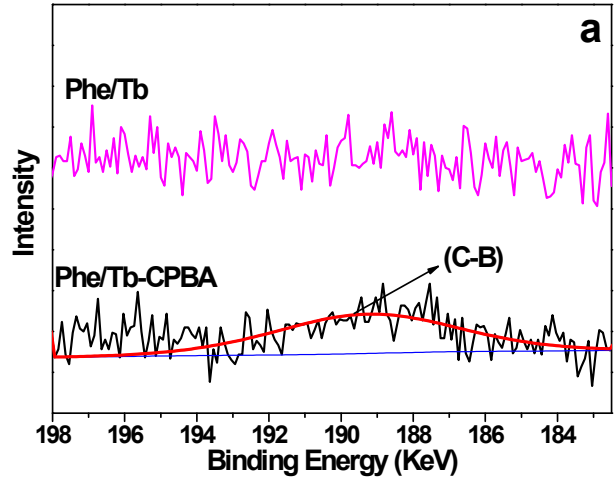


Figure S3. XPS spectra of B1s for Phe/Tb CPNPs and Phe/Tb-CPBA CPNPs (a) and O1s for Phe/Tb CPNPs, Phe/Tb-CPBA CPNPs and Phe/Tb-CPBA CPNPs treated with H<sub>2</sub>O<sub>2</sub> (b).

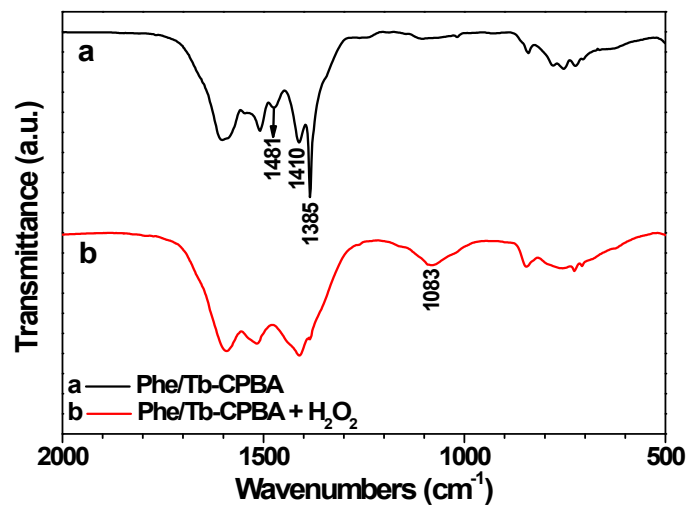


Figure S4. FTIR spectra of (a) Phe/Tb-CPBA CPNPs and (b) Phe/Tb-CPBA CPNPs in the present of 200 μM H<sub>2</sub>O<sub>2</sub>.

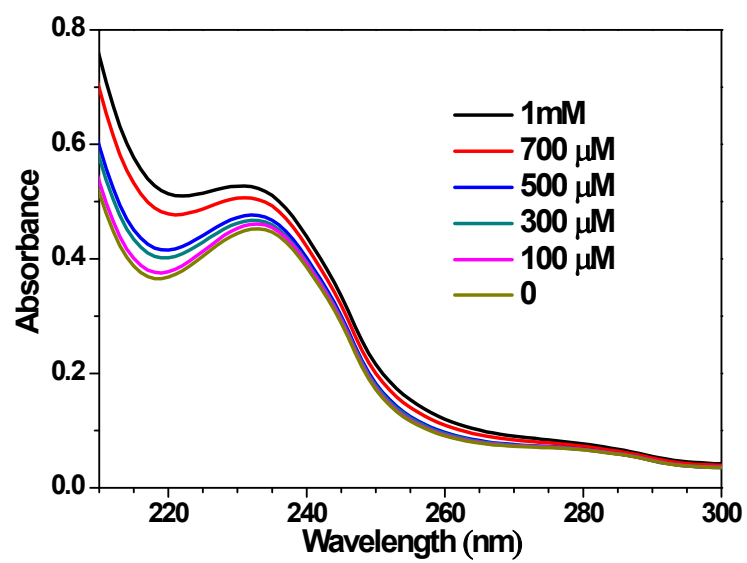


Figure S5. Absorption spectra of Phe/Tb-CPBA CPNPs in the presence of H<sub>2</sub>O<sub>2</sub> with different concentrations.

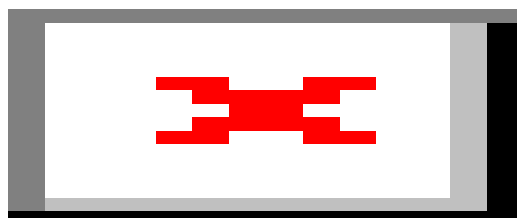


Figure S6. SEM images of Phe/Tb-CPBA CPNPs (a) and Phe/Tb-CPBA CPNPs treated with H<sub>2</sub>O<sub>2</sub> (b).

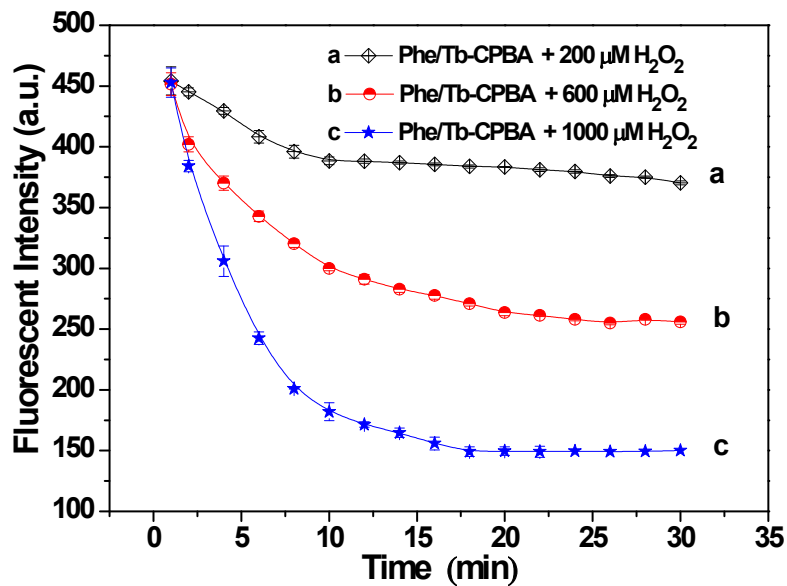


Figure S7. Changes of the fluorescence intensities of Phe/Tb-CPBA CPNPs at 545 nm with the reaction time in the presence of different concentrations of H<sub>2</sub>O<sub>2</sub> (200, 600 and 1000 μM).

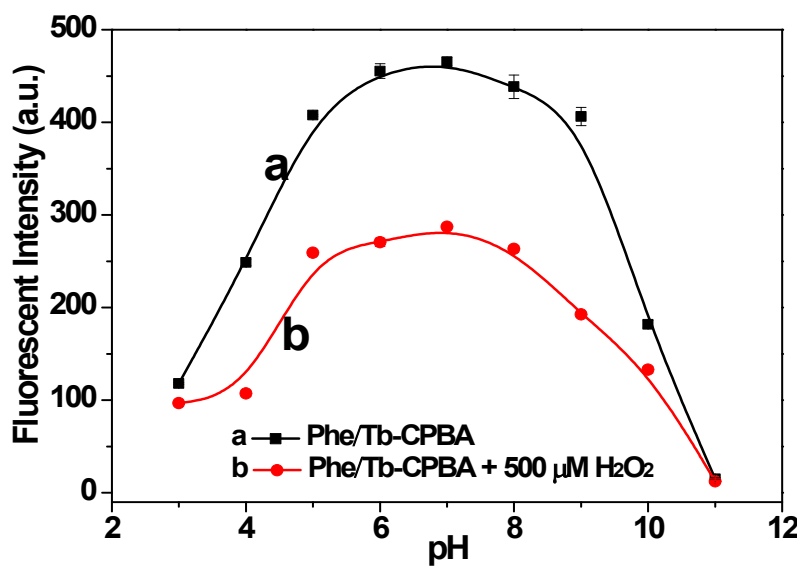


Figure S8. Effects of pH on the fluorescent intensity of Phe/Tb-CPBA CPNPs (a) and Phe/Tb-CPBA CPNPs in the presence of 500 μM H<sub>2</sub>O<sub>2</sub> (b).

Table S1. Comparison of various methods for the detection of H<sub>2</sub>O<sub>2</sub>

Methods / Sensors	Linear range ( $\mu\text{M}$ )	Detection limit ( $\mu\text{M}$ )	Real samples	Refs.
Colorimetry/Fe <sub>3</sub> O <sub>4</sub> nanoparticles	5-100	3	no	3
Colorimetry/photo-Fenton reactions	25-6000	143	no	4
Electrochemiluminescence/batch injection analysis	100-4000	10	milk	5
Electrochemiluminescence/Graphene-Cu <sub>2</sub> O	300-7800	20.8	no	6
Electrochemiluminescence/Graphene Oxide	5-1500	0.27	human serum and urine	7
Electrochemiluminescence/G-quadruplex	0.1-20	N.A.	cancer cells	8
Fluorescence/ Cationic conjugated polymers	N.A.	0.015	no	9
Fluorescence/Fenton reaction system	0.02-20	0.005	milk	10
Fluorescence/BTTA-Eu <sup>3+</sup>	100-1000	no	no	11
Fluorescence/Phe/Tb-CPBA CPNPs	6-1000	2	urine	This work

Table S2. Determination of H<sub>2</sub>O<sub>2</sub> in urine samples.

Samples	Found ( $\mu\text{M}$ )	Added ( $\mu\text{M}$ )	Detected ( $\mu\text{M}$ )	Recovery (%)	RSD (n=3, %)
Urine 1	15.60	0	15.60	—	1.38
Urine 2	15.60	50	65.53	99.55	7.70
Urine 3	15.60	100	115.96	102.31	4.99
Urine 4	15.60	150	165.39	98.65	3.07

## References

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