

**Supporting information for**

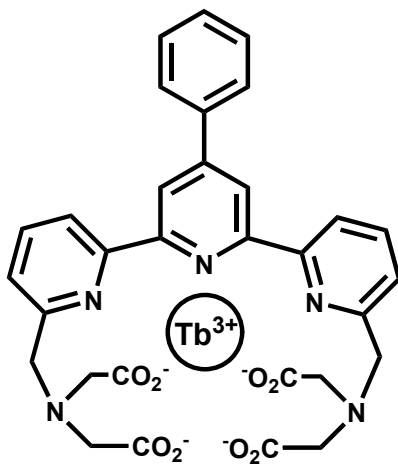
**Dual-Emissive Nanoarchitecture of Lanthanide Complex-Modified Silica  
Particles for in vivo Ratiometric Time-Gated Luminescence Imaging of  
Hypochlorous Acid**

Hua Ma, Bo Song,\* Yuanxiu Wang, Deyuan Cong, Yufei Jiang and Jingli Yuan\*

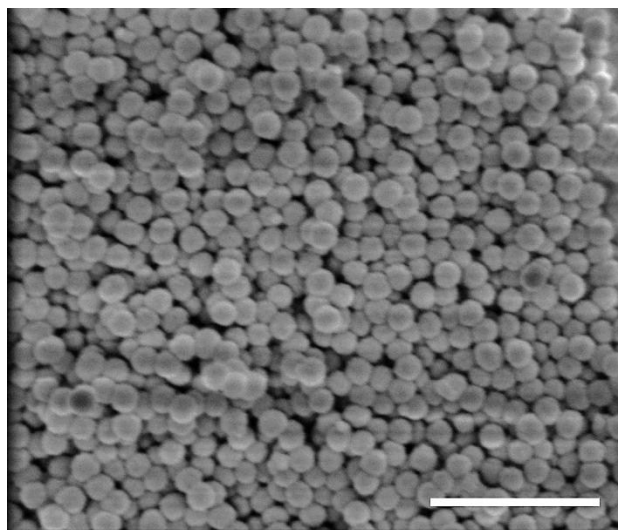
State Key Laboratory of Fine Chemicals, School of Chemistry, Dalian University of  
Technology, Dalian 116024, P. R. China

\*Corresponding authors. Tel/Fax: +86-411-84986041

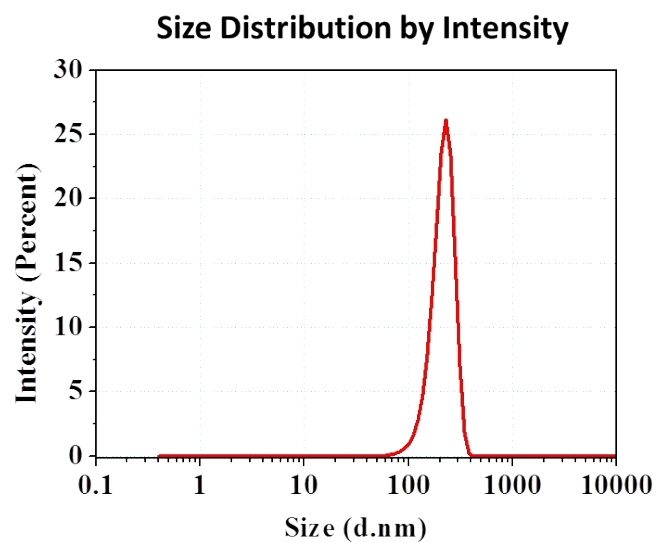
E-mail addresses: bo.song@dlut.edu.cn (B. Song); jlyuan@dlut.edu.cn (J. Yuan).



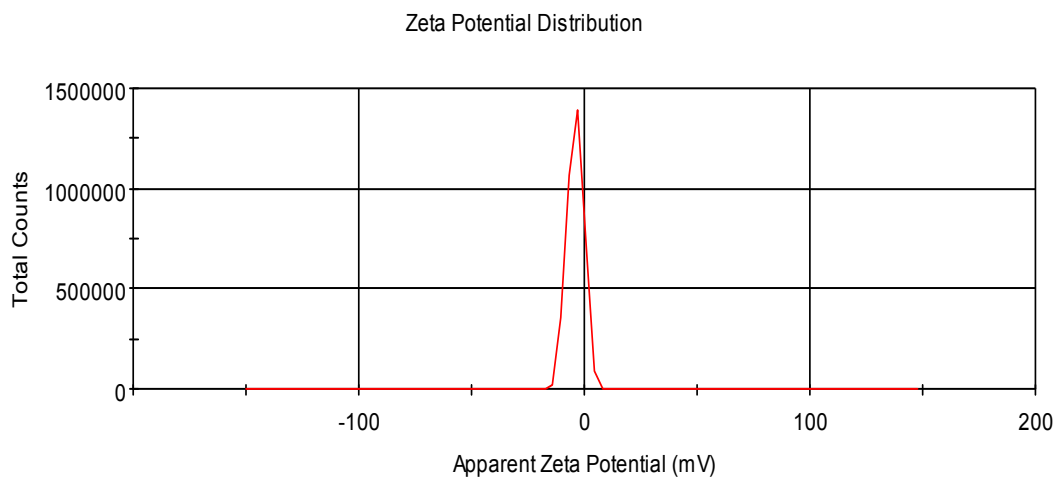
**Fig. S1.** Chemical structure of PTTA-Tb<sup>3+</sup> chelate.



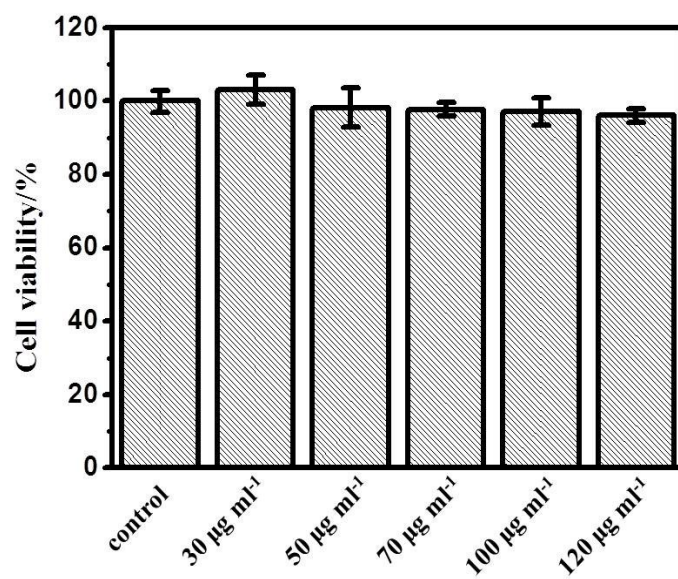
**Fig. S2.** Scanning electronic microscopy (SEM) image of RTLNP particles. Scale bar: 500 nm.



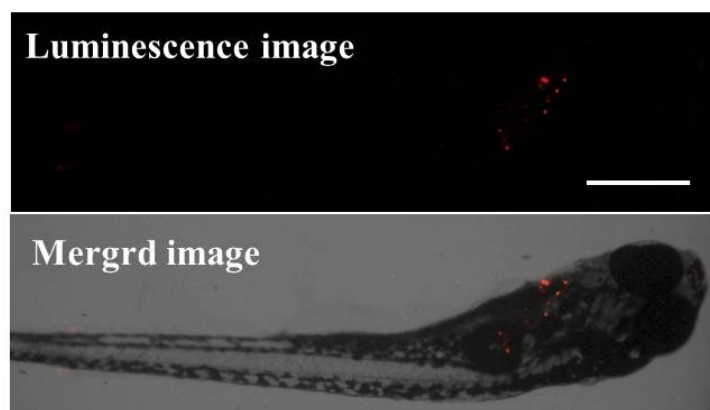
**Fig. S3.** The hydrated particle size distribution of RTLNP particles in water by dynamic light scattering (DLS) measurement (DLS diameter: 241.4 nm).



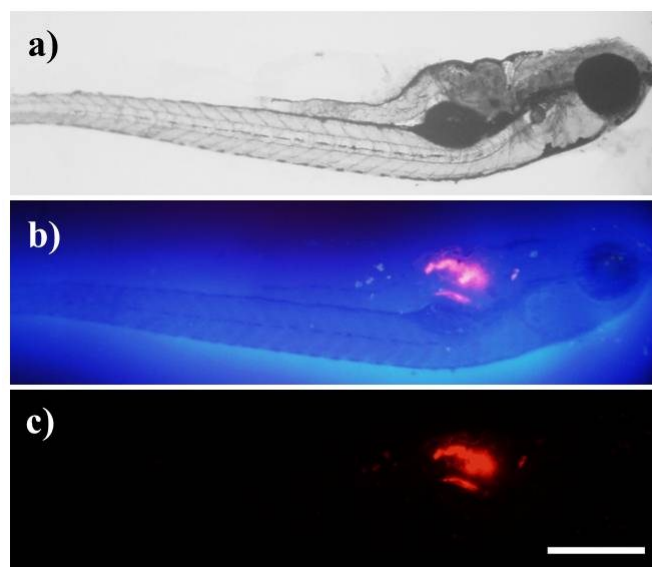
**Fig. S4.** The zeta potential of RTLNP particles in 0.01 M PBS buffer of pH 7.4, containing 1.0 mg ml<sup>-1</sup> solubilizer, cremophor C040 (-3.72 mV).



**Fig. S5.** Viabilities of Raw 264.7 cells after incubated with different concentrations of RTLNP for 24 h.

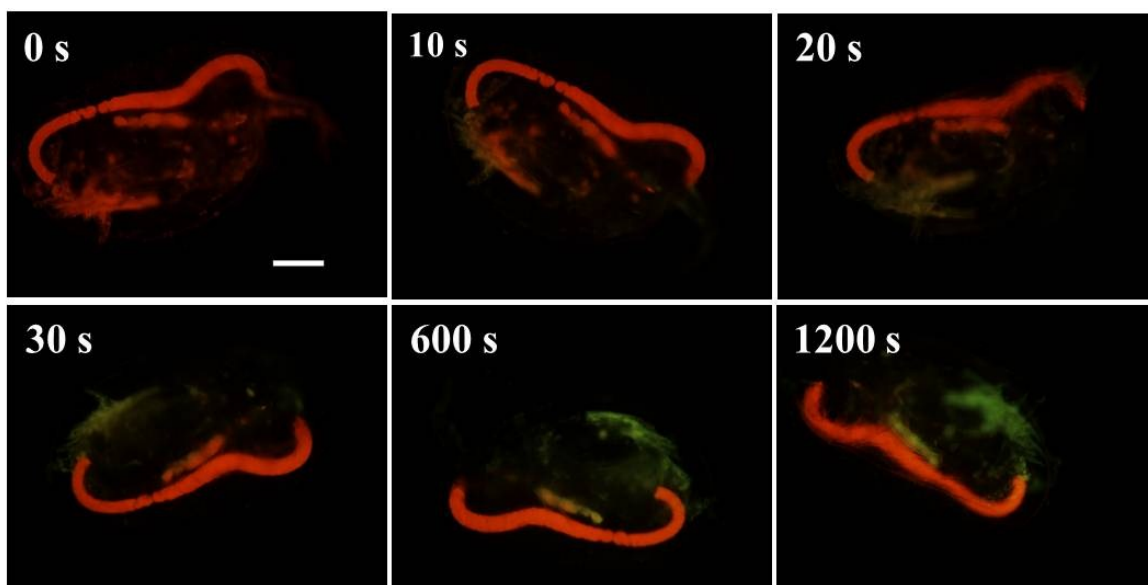


**Fig. S6.** Luminescence images of 5-day-old zebrafish loaded with RTLNP ( $100 \mu\text{g ml}^{-1}$ ) for 1.5 h, followed by incubation with fresh culture medium for 3 h. Scale bar: 500  $\mu\text{m}$ .

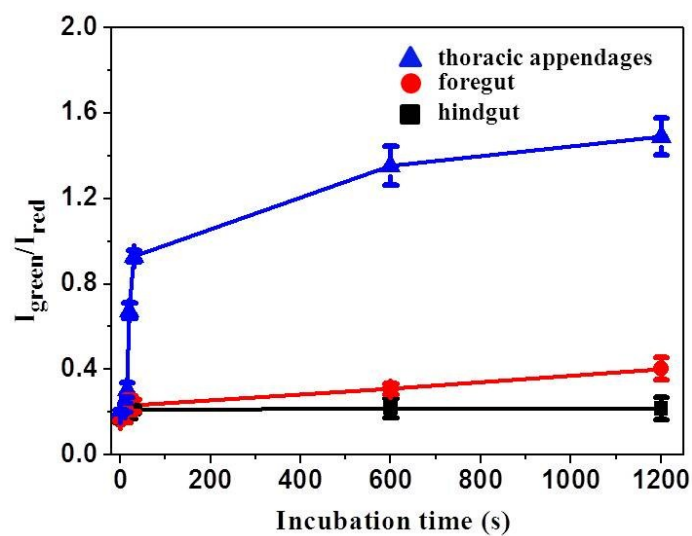


**Fig. S7.** Bright-field, steady-state luminescence and time-gated luminescence images of 5-day-old zebrafish loaded with RTLNP ( $100 \mu\text{g ml}^{-1}$ ) for 1.5 h (no emission filter was used for the imaging). Scale bar: 500  $\mu\text{m}$ .

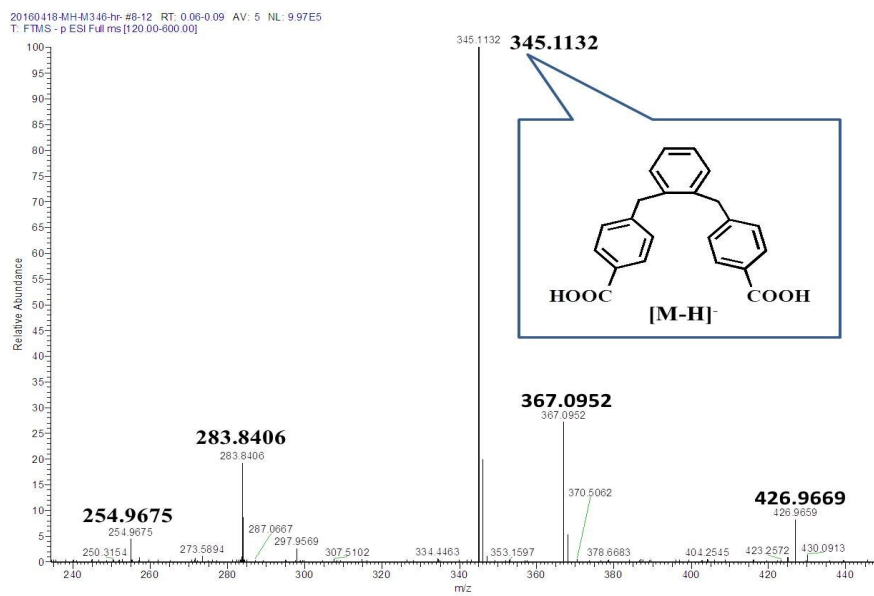




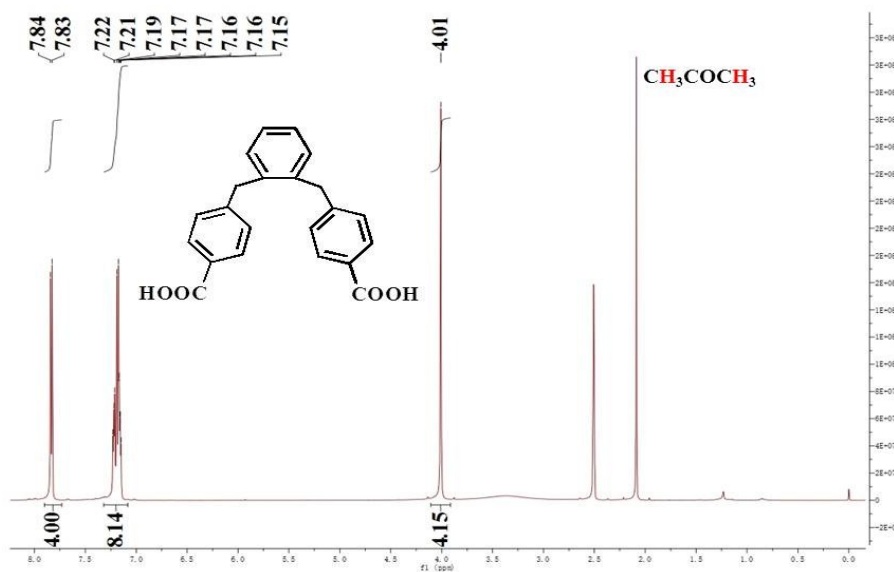
**Fig. S8.** Time-gated luminescence images of *Daphnia magna* loaded with  $100 \mu\text{g ml}^{-1}$  RTLNP for 1.5 h, and followed by incubation with  $50 \mu\text{M HClO}$  at different incubation times (no emission filter was used for the imaging).



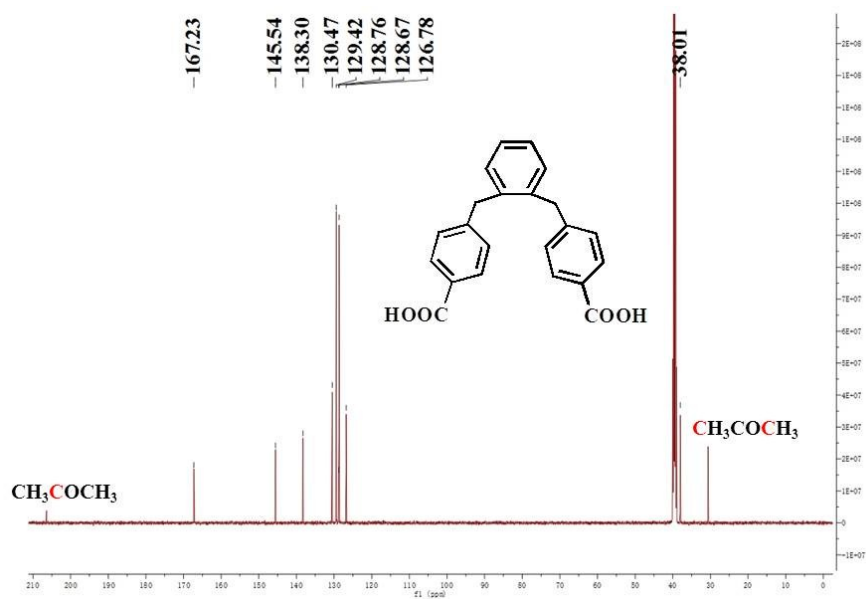
**Fig. S9.** Time-dependent accumulations of HClO in thoracic appendages, foregut and hindgut of *Daphnia magna*. *Daphnia magna* were loaded with 100  $\mu\text{g ml}^{-1}$  RTLNP for 1.5 h, and followed by incubation with 50  $\mu\text{M}$  HClO at different incubation times. The accumulations of HClO in different organs of *Daphnia magna* were evaluated by the local luminescence ratio ( $I_{\text{green}}/I_{\text{red}}$ ) of RTLNP.



**Fig. S10.** HRMS of the oxidation product of BHHBB-Eu<sup>3+</sup> by HClO.



**Fig. S11.** <sup>1</sup>H NMR spectrum (500 MHz, in d<sub>6</sub>-DMSO) of the oxidation product of BHHBB-Eu<sup>3+</sup> by HClO.



**Fig. S12.**  $^{13}\text{C}$  NMR spectrum (125 MHz, in  $\text{d}_6$ -DMSO) of the oxidation product of BHHBB- $\text{Eu}^{3+}$  by  $\text{HClO}$ .