Electronic Supplementary Material (ESI) for Nanoscale.

Electronic Supporting Information for

Thiazole Derivative Modified Upconversion Nanoparticles for Detection of Hg^{2+} in Living Cells

Bin Gu,[a] Yi Zhou,[a] Xiao Zhang,[a] Xiaowang Liu,[b] Yuhai Zhang,[b] Robert Marks,[d] Hua Zhang,[a] Xiaogang Liu[b] and Qichun Zhang*[a,c]

a. School of Materials Science and Engineering Nanyang Technological University Singapore, 50 Nanyang Avenue, 639798. E-mail: qczhang@ntu.edu.sg

b. Department of Chemistry, National University of Singapore, 3 Science Drive 3, Singapore 117543.

c. Division of Chemistry and Biological Chemistry, School of Physical and Mathematical Sciences,Nanyang Technological University,Singapore 637371.

d. Department of Biotechnology Engineering, Ben Gurion University of the Negev, Beer Sheva, Israel, 8410501

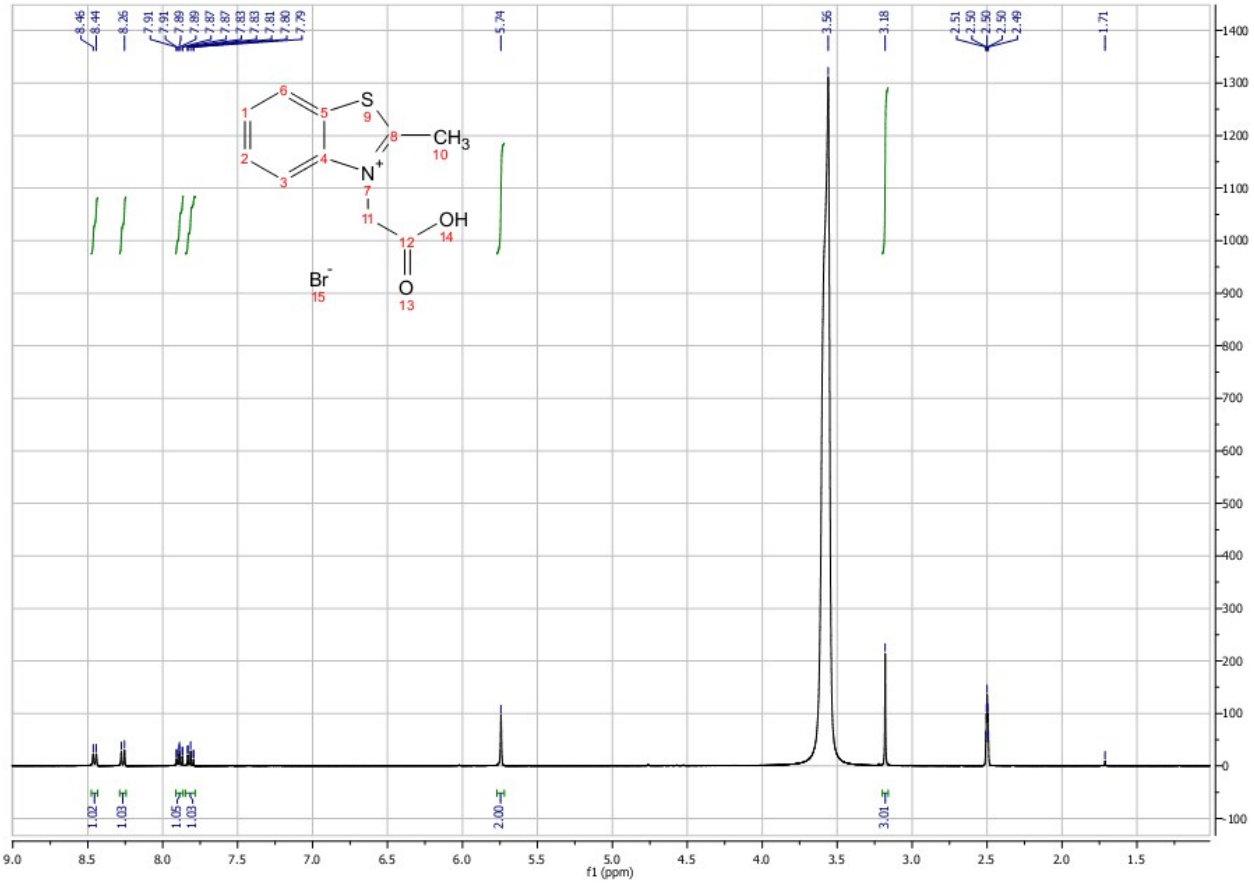

Fig S1. ^{1}H-NMR spectrum of compounds **1** in DMSO.

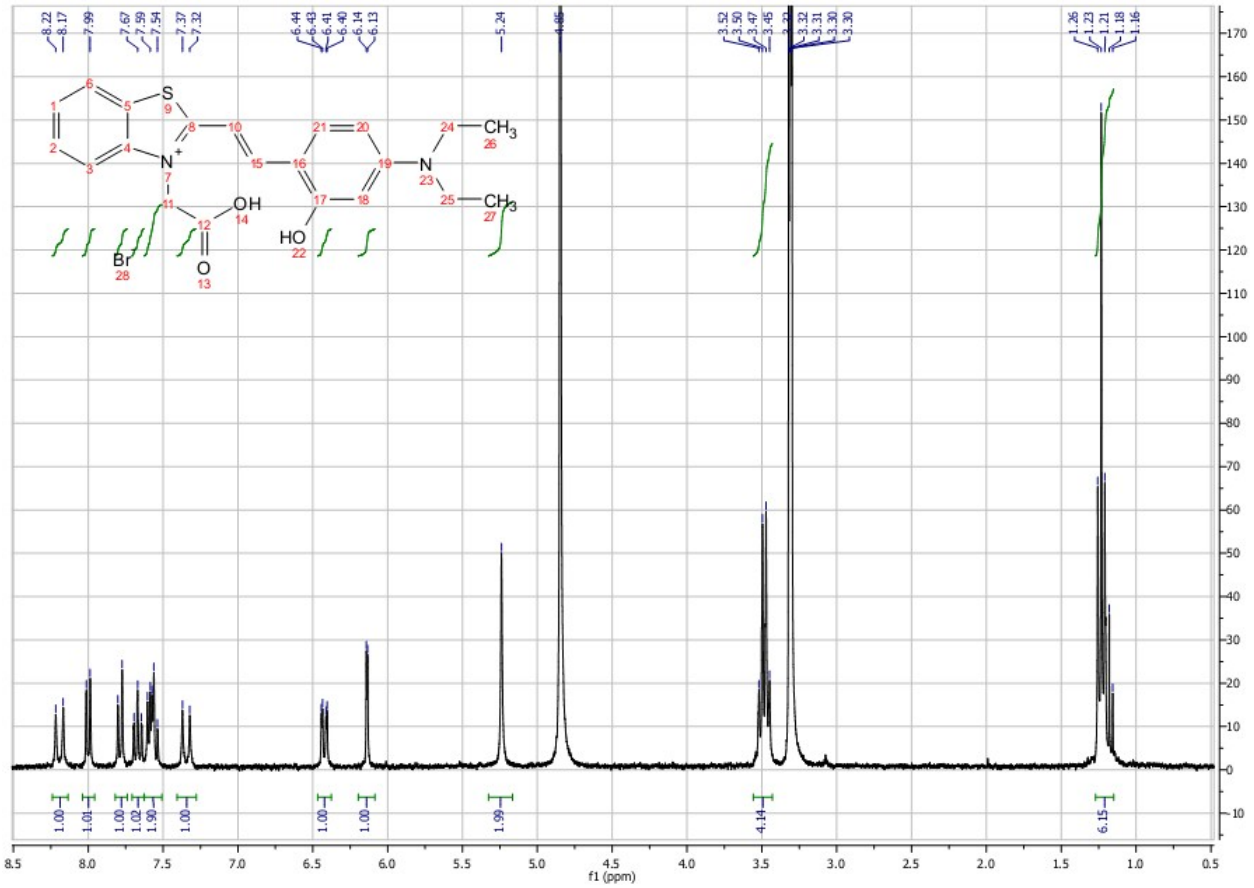

Fig S2. ^{1}H-NMR spectrum of compounds **2** in CD_3OD. We can't get ^{13}C-NMR of compound **2** because of its poor solubility in organic solvents.

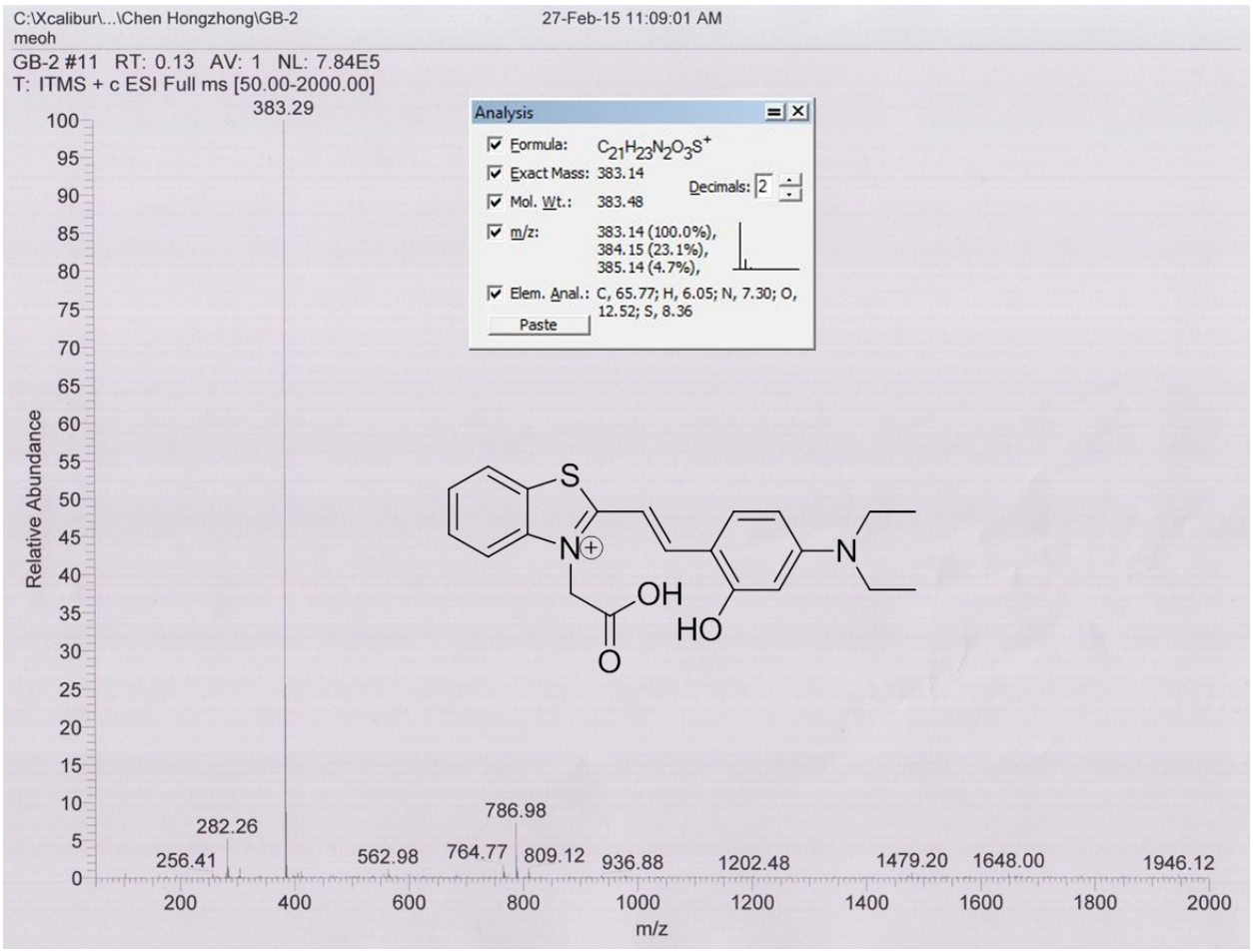

Fig S3. ESI-MS spectrum of compound **2**.

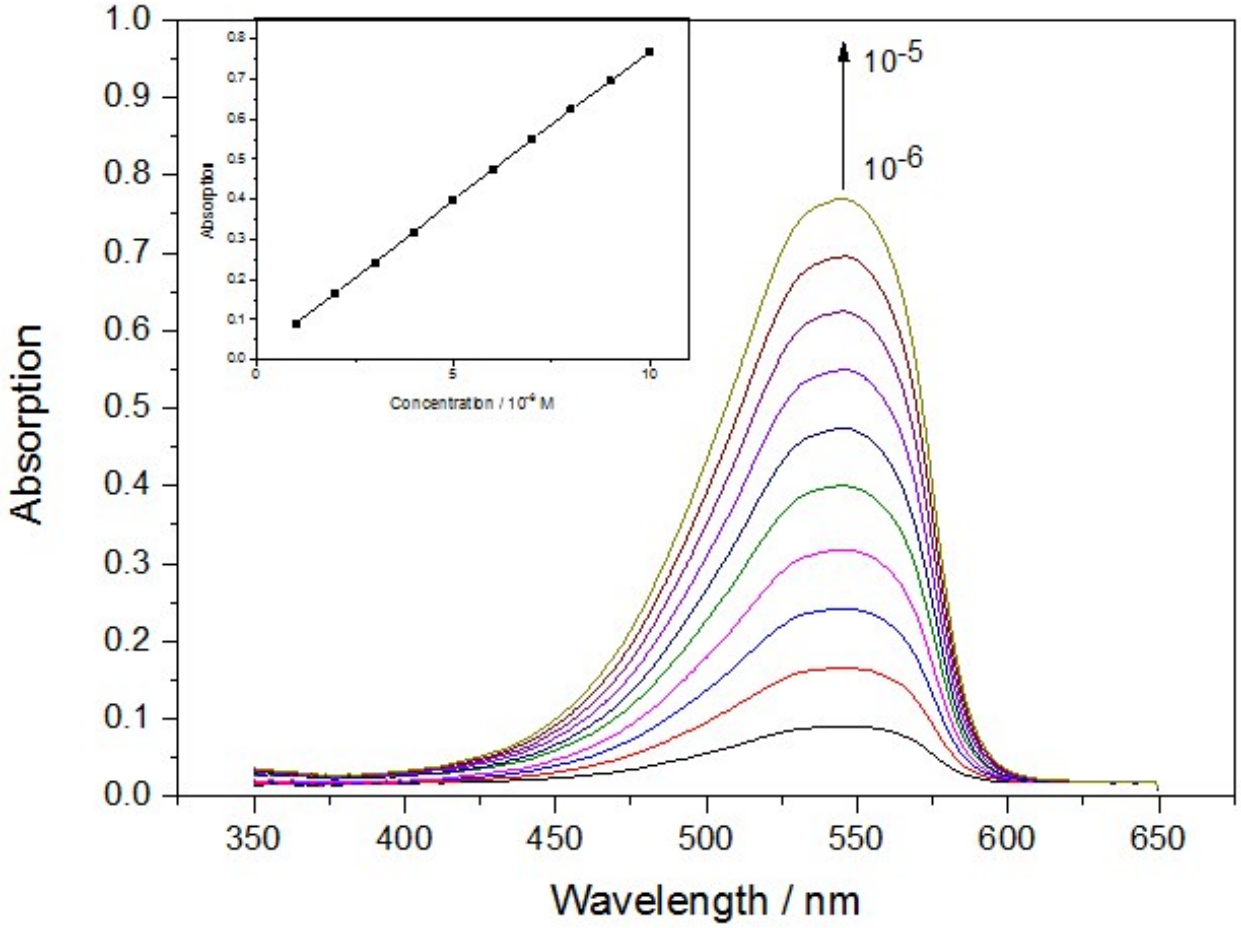

Fig S4. Molar Absorptivity of Compound **2** in DMSO/HEPES (1:9, v:v).

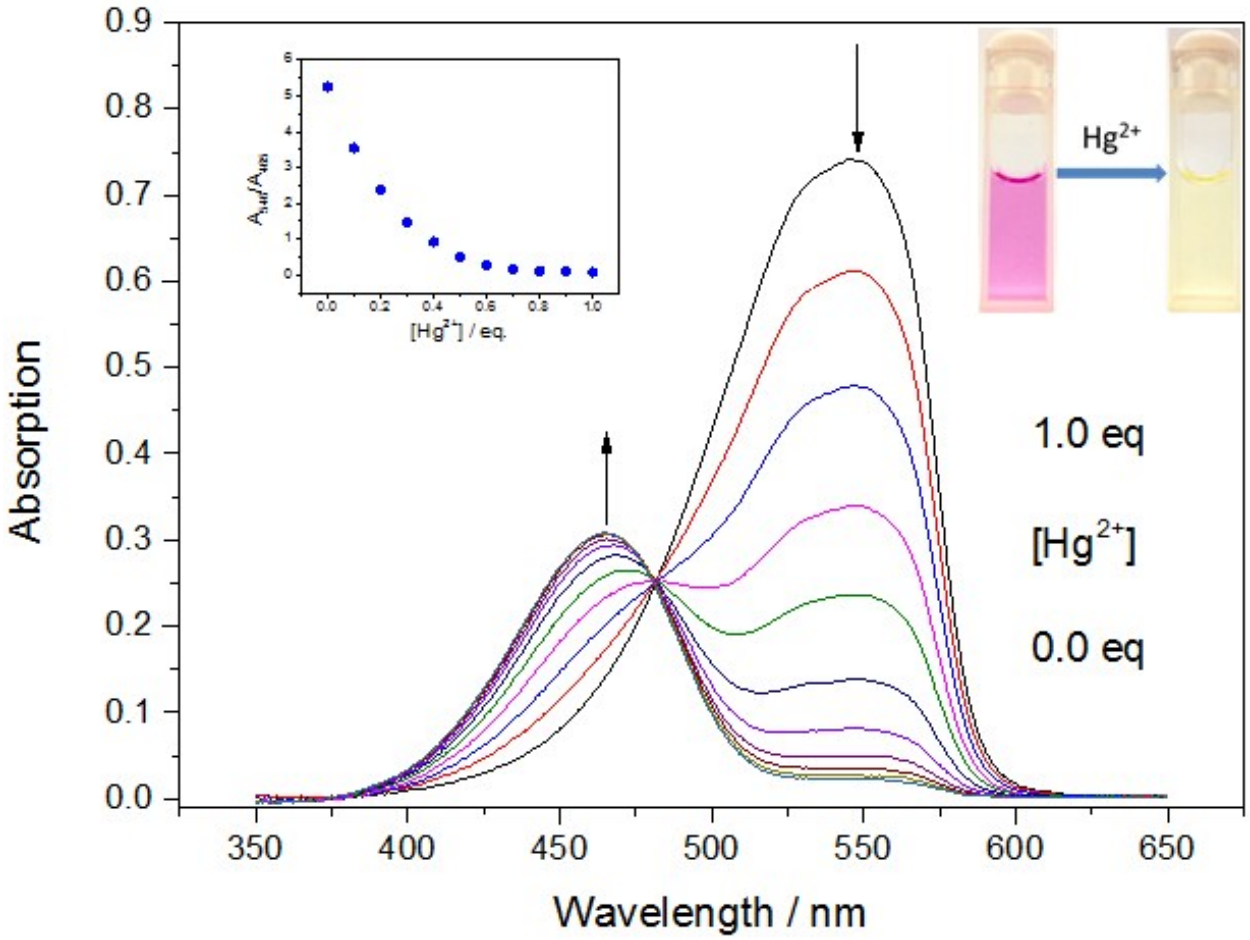

Fig S5. Absorption spectrum of compound 2 with the addition of Hg^{2+} from 0 to 1 eq in DMSO/HEPES (1:9, v:v). The inset is the color change from red to green and absorption ratio of 546 nm to 465 nm decreases with the addition of Hg^{2+}.

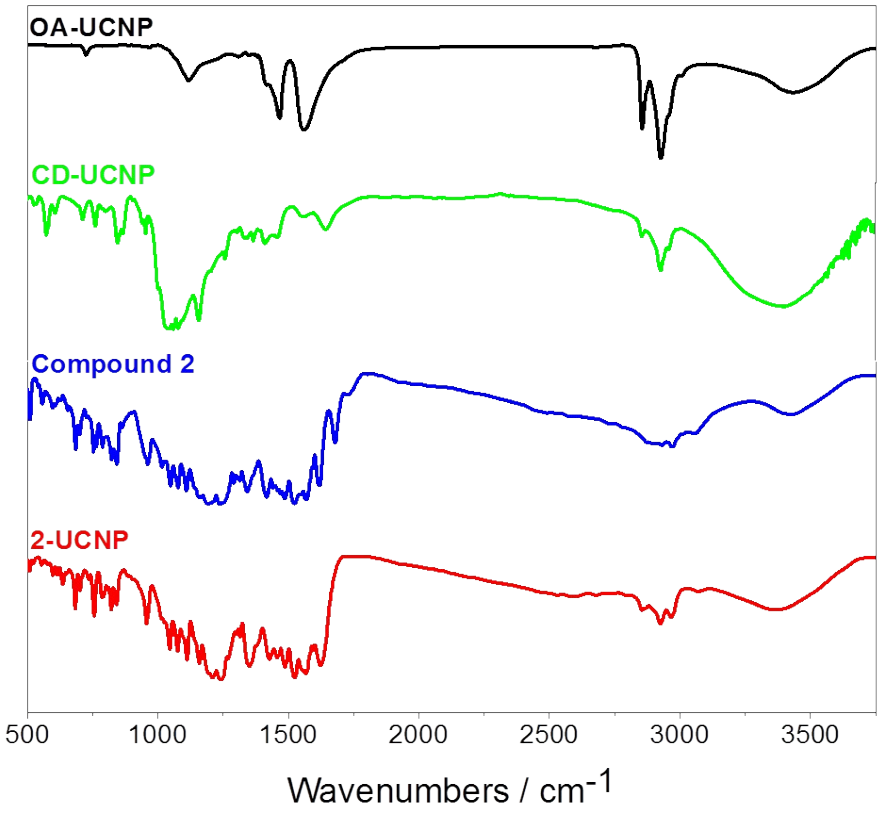

Fig S6. FTIR spectrum of OA-UCNP, α-CD UCNP, compound **2** and **2**-UCNP.

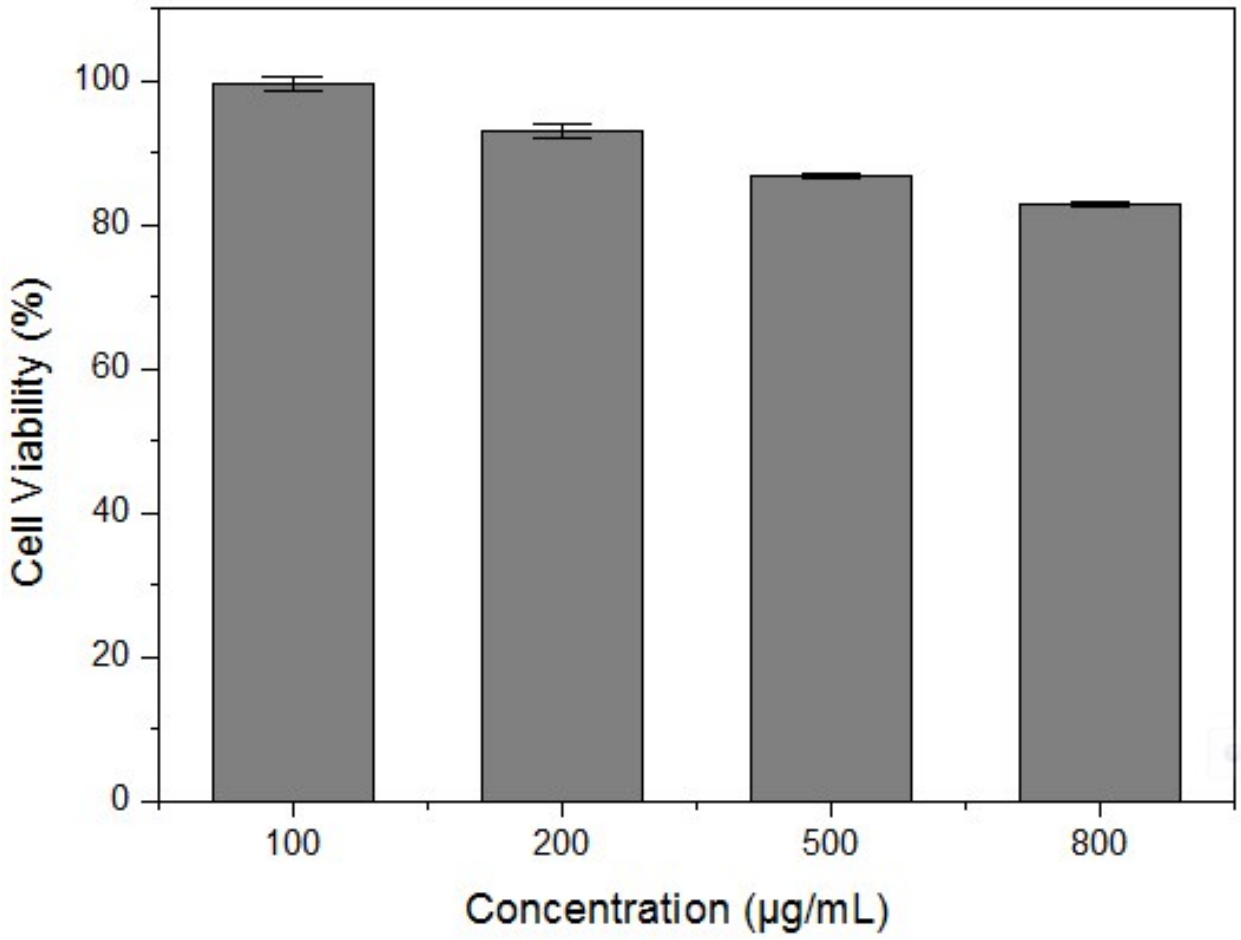

Fig S7. Cell viability was quantified by the MTT assay (Hela cells, 24h).

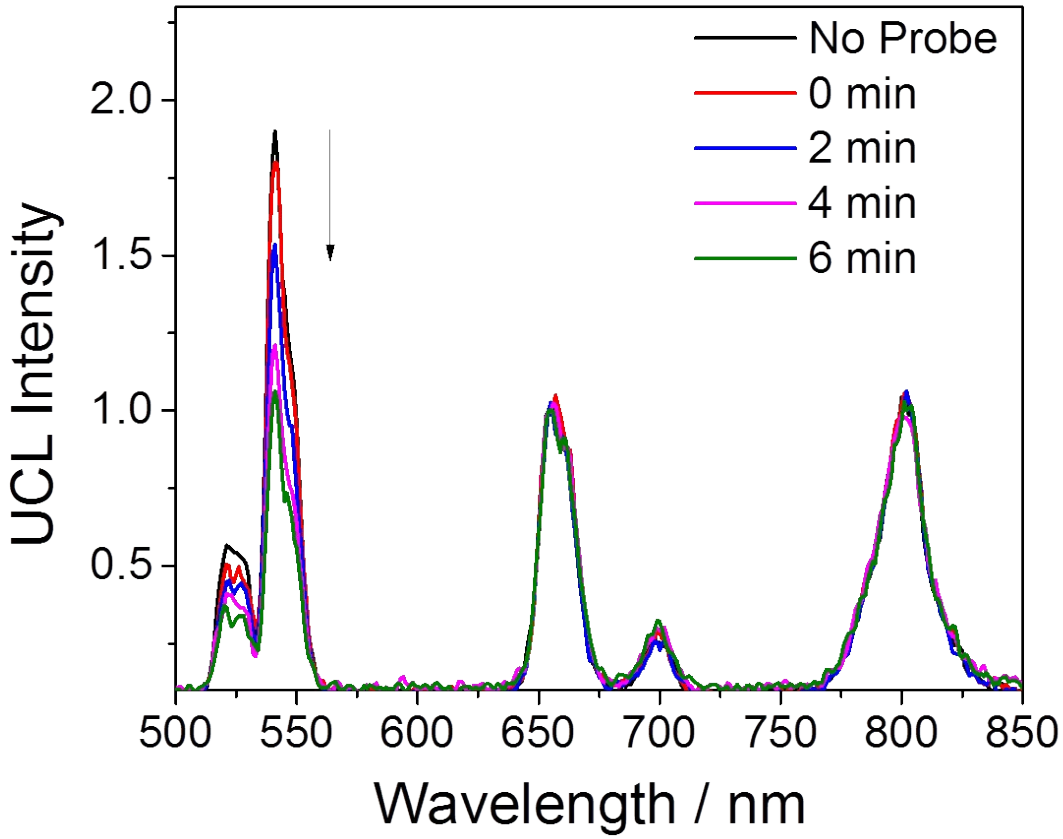

Fig S8. UCL intensity change after physical mixing of OA-UCNP with compound 2. The 540 nm band decreased about 45% in 6 minutes after the physical mixing at room temperature.

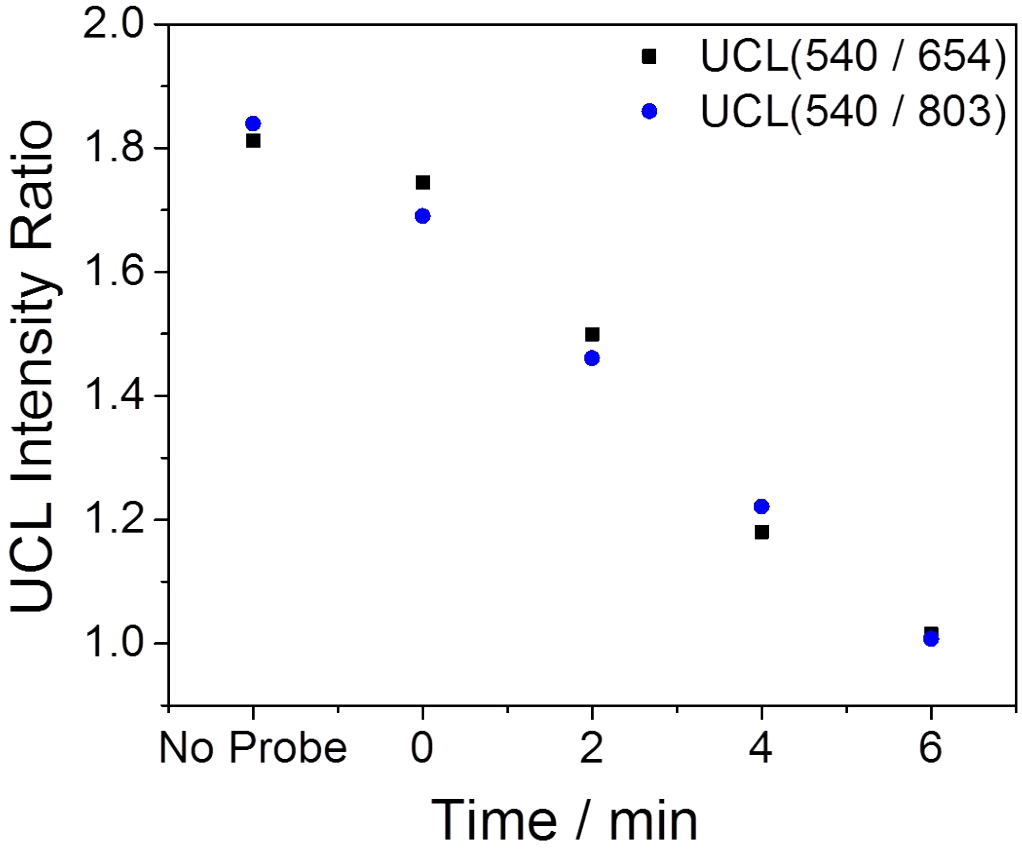

Fig S9. UCL intensity ratio of 540 nm to 654 nm and 540 nm to 803 nm.

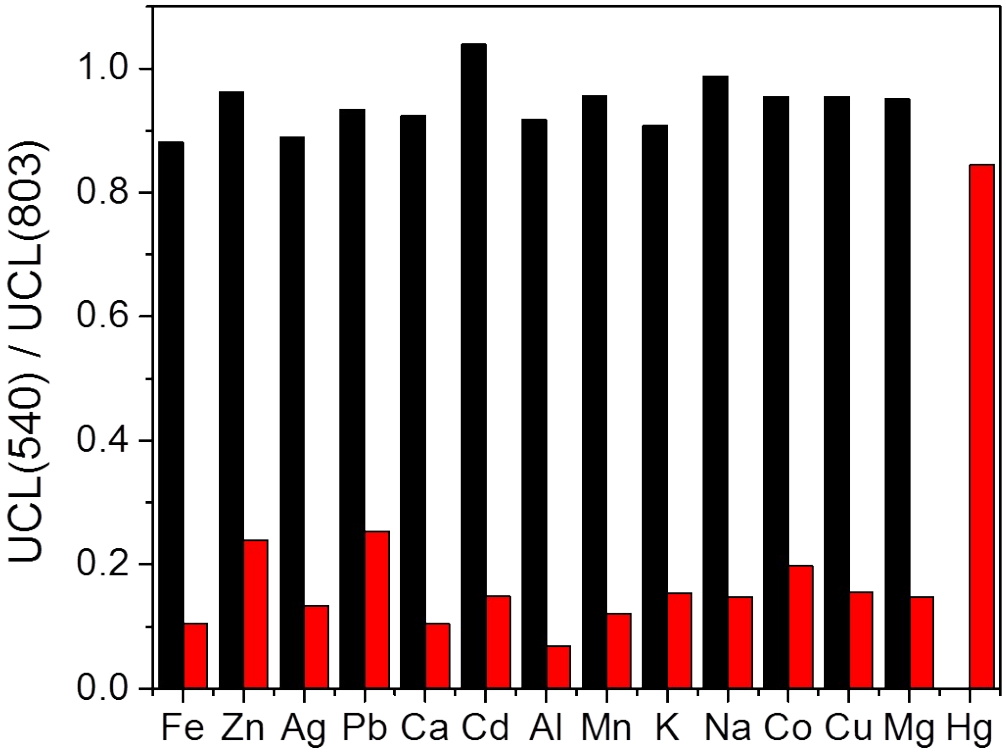

Fig S10. UCL intensity ratio of 540 nm to 803 nm of 2-UCNP, in the presence of various representative metal ions (3.5 mM).

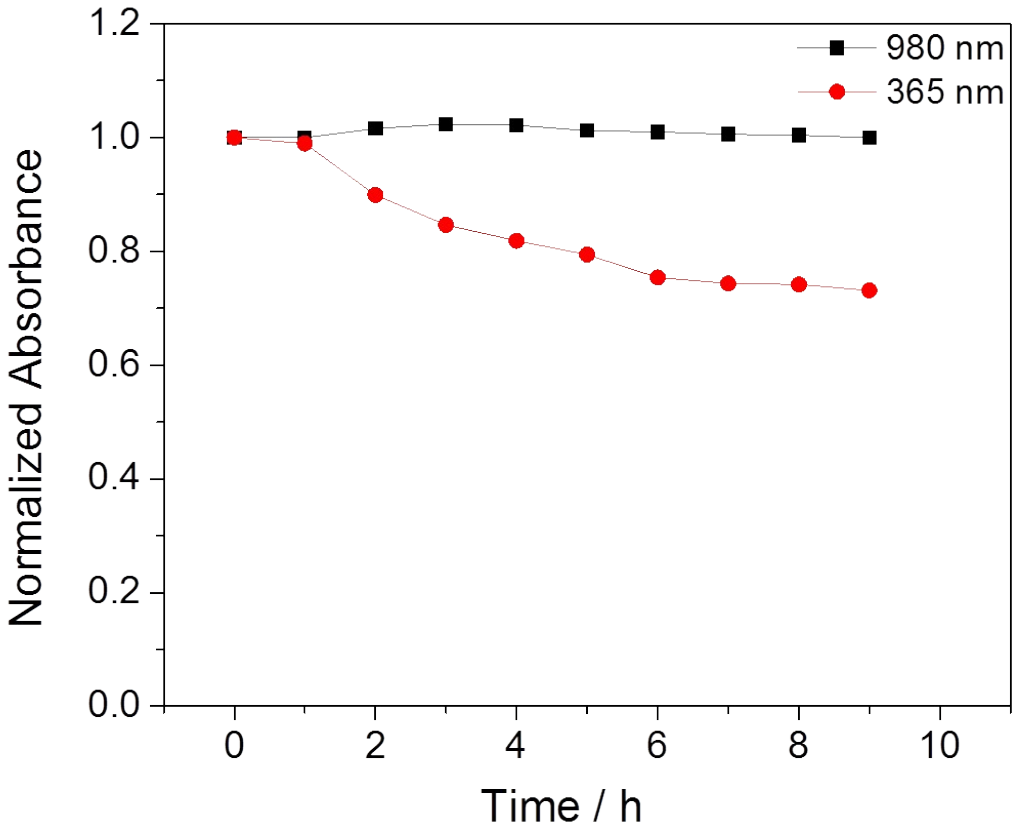

Fig S11. Photo stability of 2-UCNP under continuously illumination by 980 nm laser and 365 nm lamp for 9 hours.

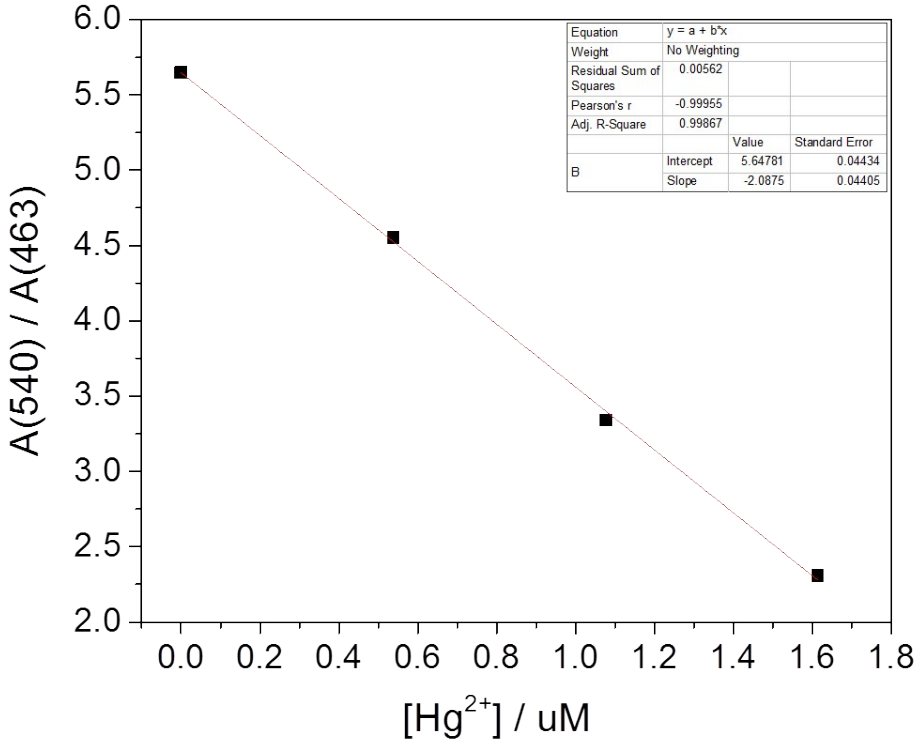

Fig S12. The analysis of detection limit of Hg^{2+} through absorption data.

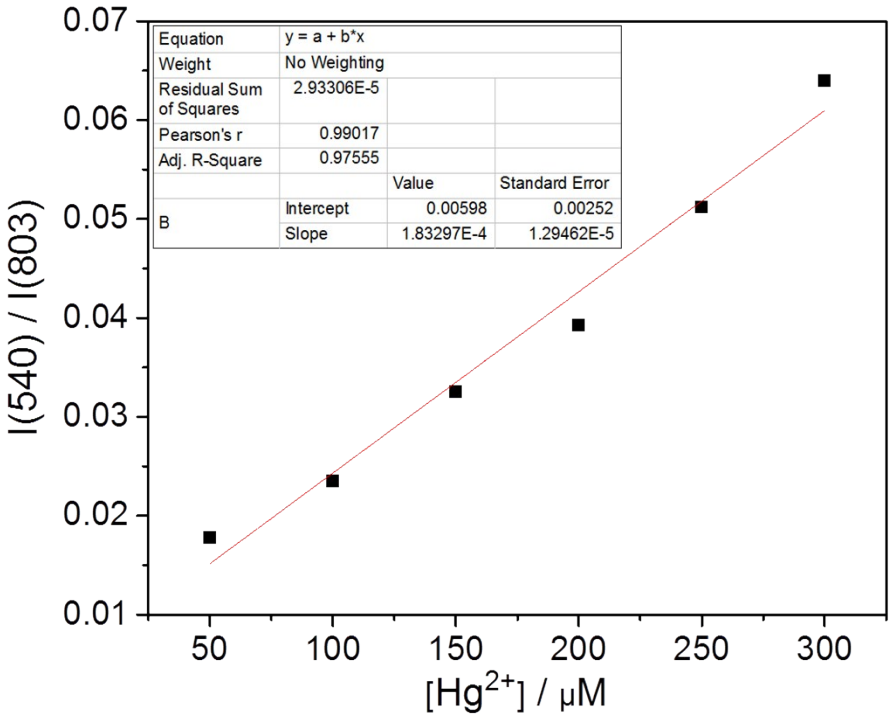

Fig S13. The analysis of detection limit of Hg^{2+} through UCL data.