



## Supporting Information

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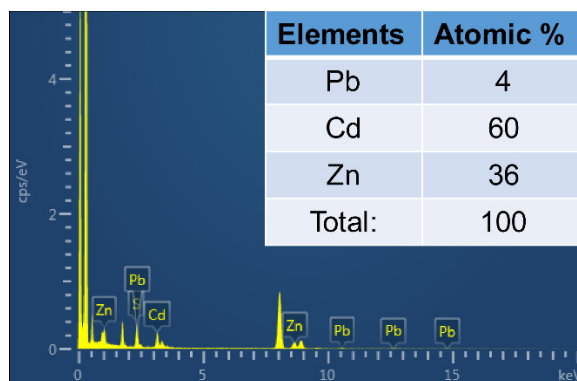
Near-Infrared Upconversion Luminescence and Bioimaging In Vivo Based on Quantum Dots

*Xiaochen Qiu, Xingjun Zhu, Xianlong Su, Ming Xu, Wei Yuan, Qingyun Liu, Meng Xue, Yawei Liu, Wei Feng,\* and Fuyou Li\**

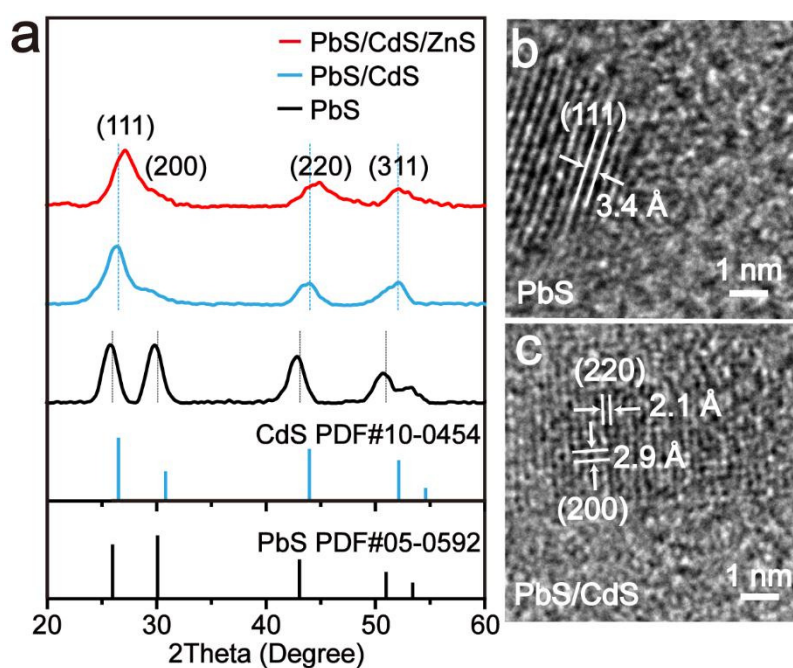
## Supporting Information

### **Near-Infrared Upconversion Luminescence and Bioimaging in vivo Based on Quantum Dots**

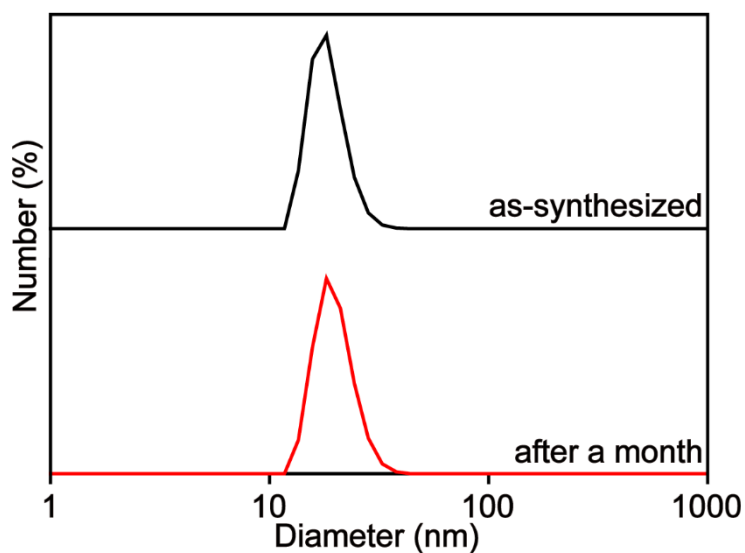
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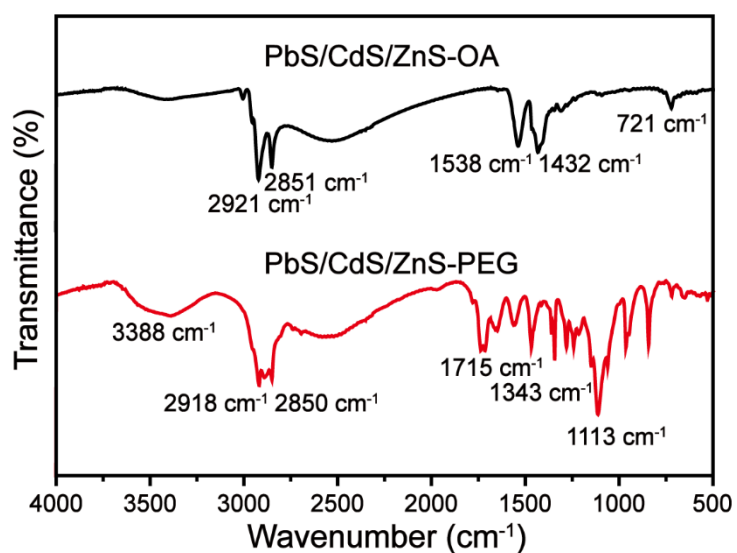
**Figure S1.** EDS spectrum of PbS/CdS/ZnS QDs.



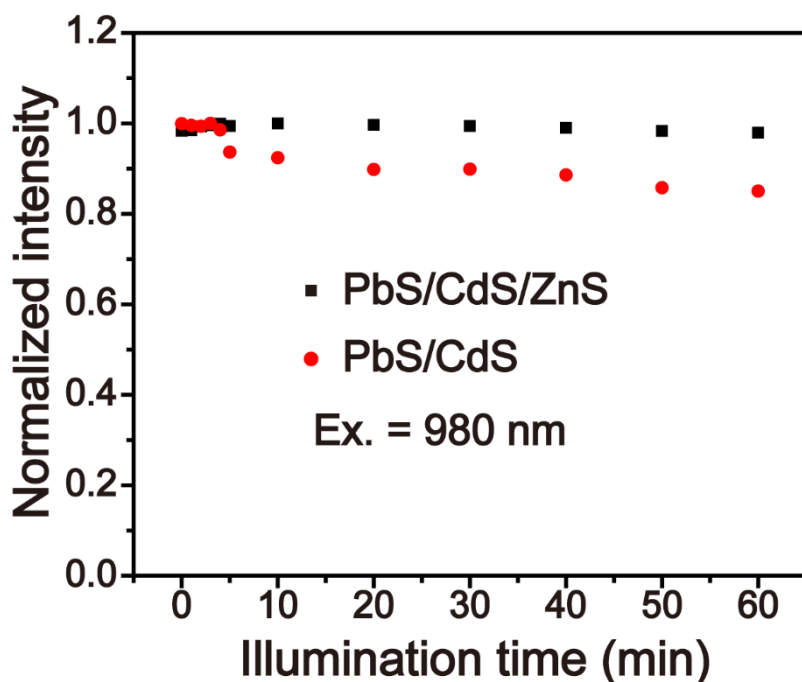
**Figure S2.** (a) XRD patterns of PbS, PbS/CdS, and PbS/CdS/ZnS QDs powders. Vertical bars (bottom) correspond to reference data of the rock-salt cubic crystalline structure of PbS (black) and zinc blende structure of CdS (blue) (PDF#05-0592 and PDF#10-0454, respectively). High-resolution TEM images of (b) the as-prepared PbS QDs and (c) PbS/CdS QDs.



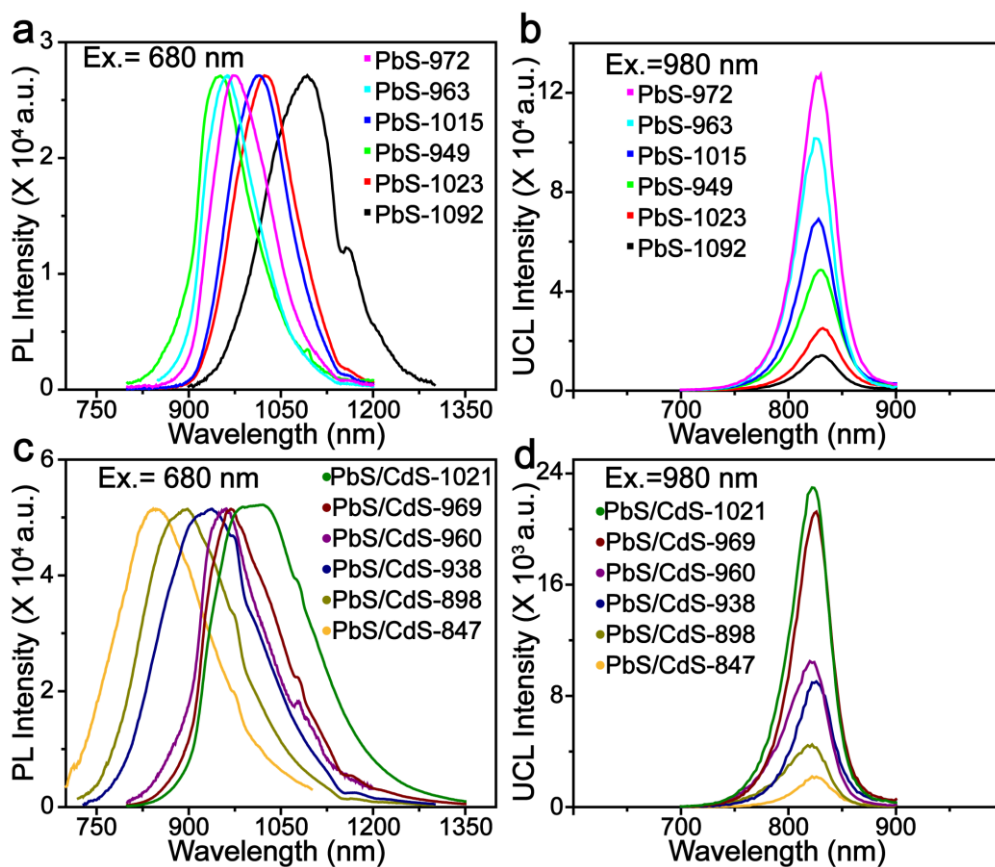
**Figure 3.** Dynamic light scattering patterns of PbS/CdS/ZnS-PEG in DI water as-synthesized and after storage for a month.



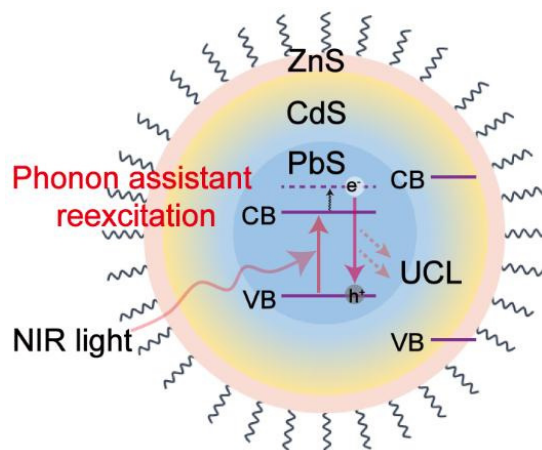
**Figure S4.** FT-IR spectra of the as-synthesized UCL-QDs-OA and UCL-QDs-PEG.



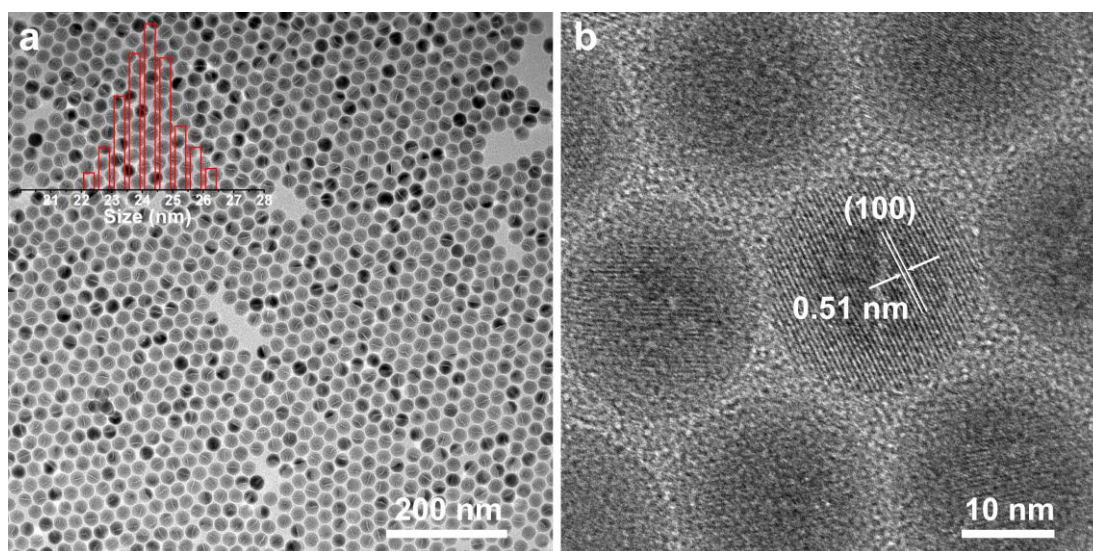
**Figure S5.** Time-dependent UCL intensity of PbS/CdS and PbS/CdS/Zn QDs aqueous solution excited under 980 nm, 200 mW/cm<sup>2</sup> laser.



**Figure S6.** PL spectra (a and c) and corresponding UCL spectra (b and d).

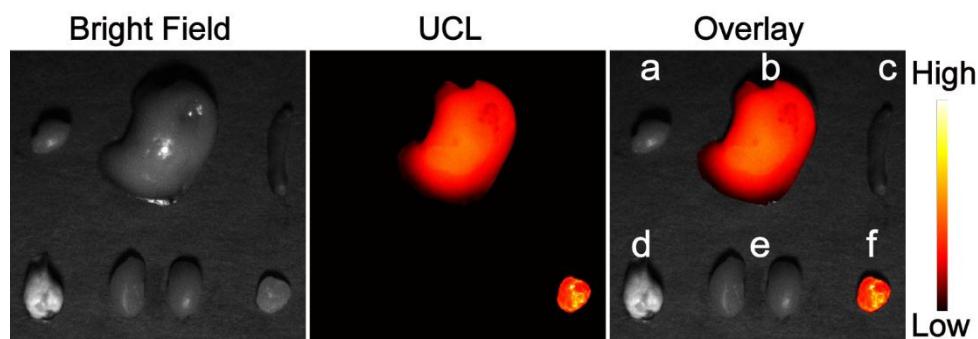


**Figure S7.** Schematic diagram of phonon-assisted single photon UCL of UCL-QDs.

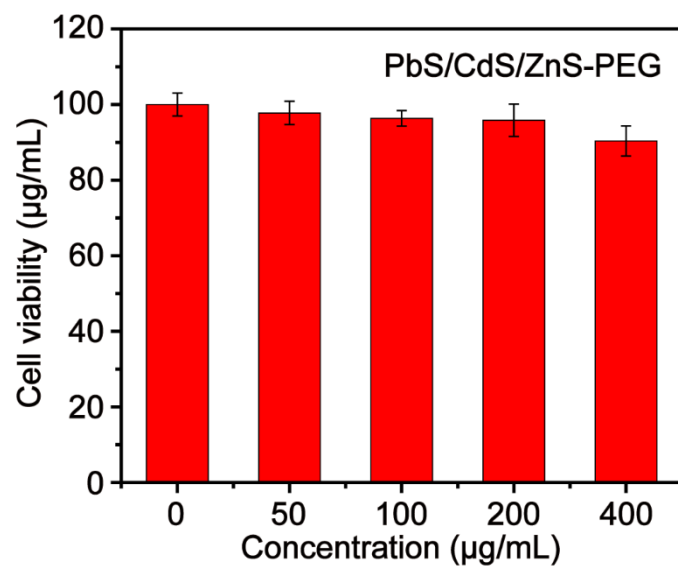


**Figure S8.** (a) TEM image and (b) HR-TEM image of NaYbF<sub>4</sub>:0.5%Tm@NaYF<sub>4</sub> UCNPs.

Inset of (a) shows the corresponding size distributions.



**Figure S9.** Ex vivo UCL imaging of tumor nude mice with intravenous injection of UCL-QDs (200  $\mu$ L, 3 mg/mL) after 6 h. a: heart; b: liver; c: spleen; d: lung; e: kidney and f: tumor.



**Figure S10.** Cell viability values (%) estimated by the MTT proliferation test after incubation with different concentrations of UCL-QDs (0–400 µg/mL) for 24 h at 37 °C.