

Electronic Supplementary Information

An upconversion nanoparticle/Ru(II) polypyridyl complex assembly for NIR-activated release of a DNA covalent-binding agent

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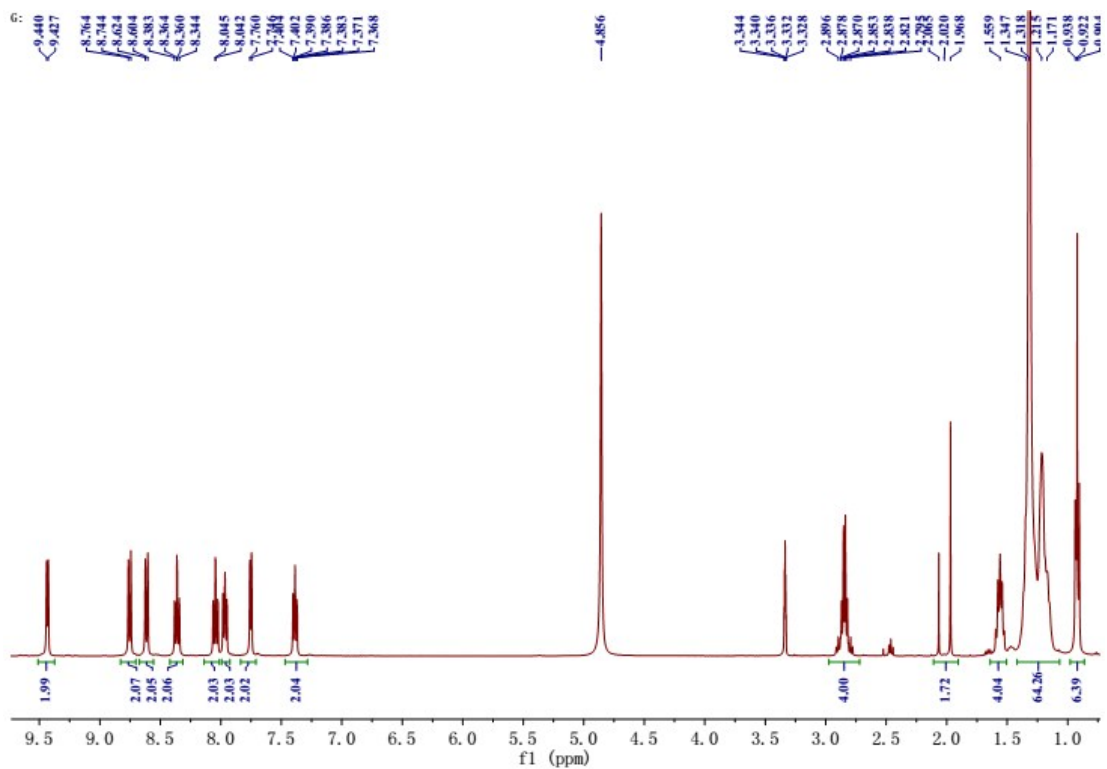


Figure S1. ^1H NMR spectrum of **1** in CD_3OD .

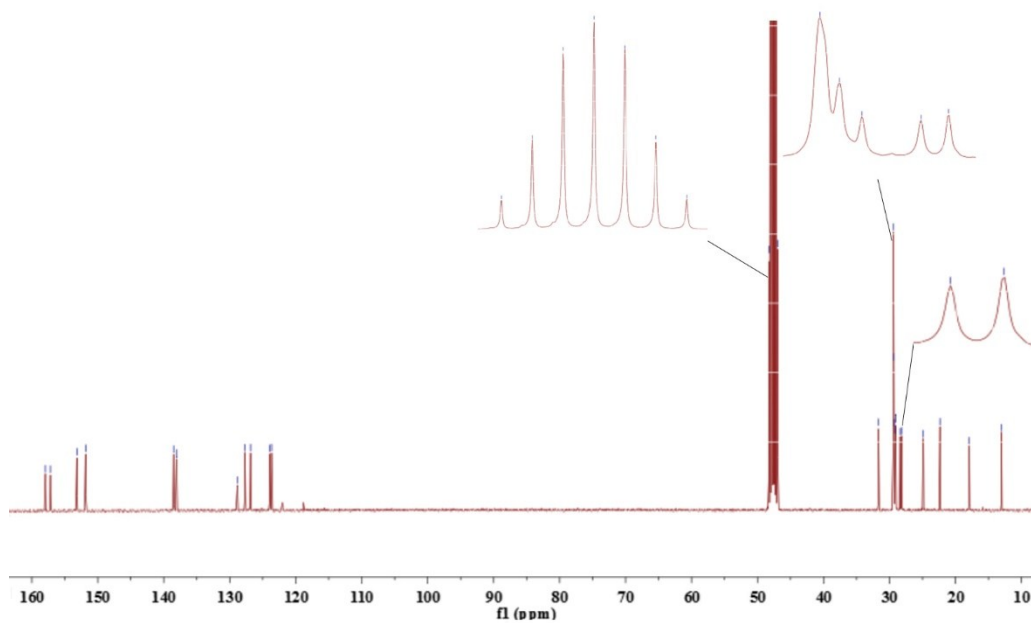


Figure S2. ^{13}C NMR spectrum of **1** in CD_3OD .

Cheryumeng-3 #11 RT: 0.11 AV: 1 NL: 4.07E8
T: FIMS+pESI Full ms [100.00-1500.00]

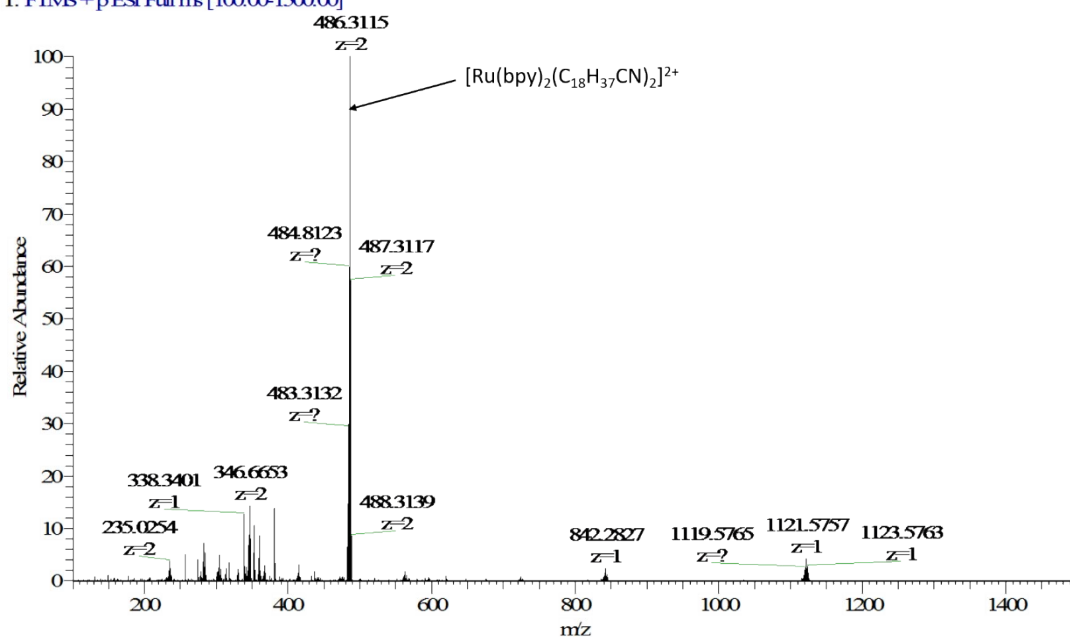


Figure S3. HR ESI-MS spectrum of 1 in H₂O (10 % C₂H₅OH).

Cheryumeng-8 160120151641 #11-13 RT: 0.11-0.13 AV: 2 NL: 4.24E7
T: FIMS+pESI Full ms [50.00-750.00]

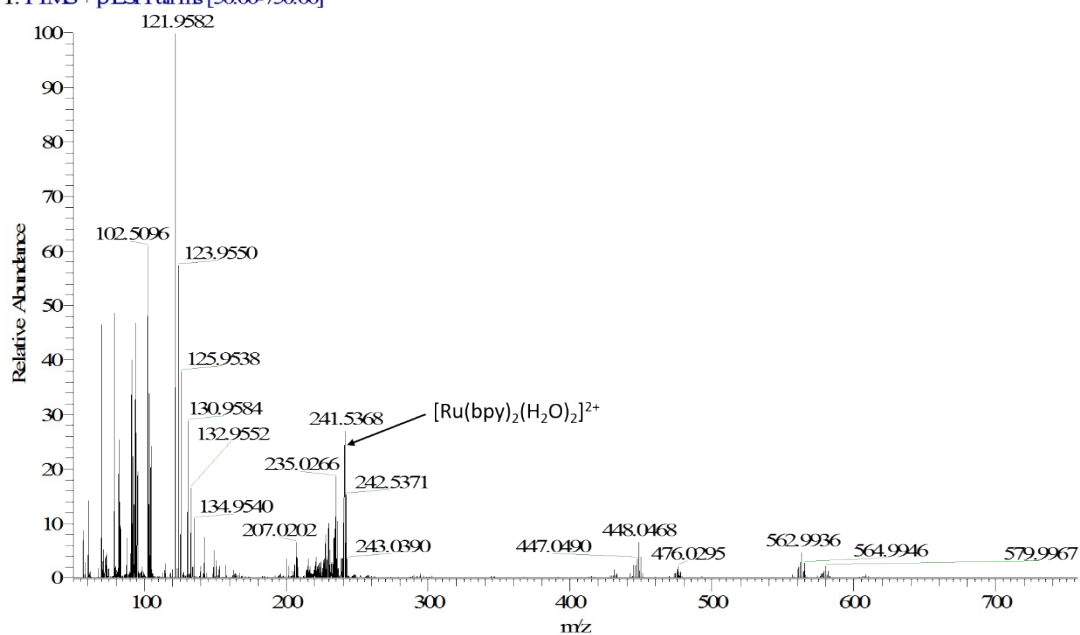


Figure S4. HR ESI-MS spectrum of 1 in H₂O (10 % C₂H₅OH) after photolysis.

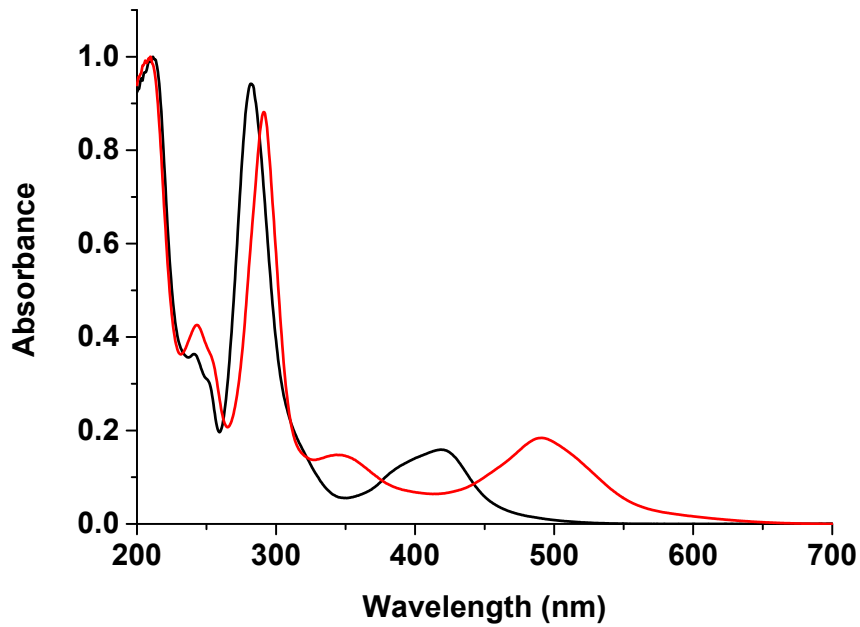


Figure S5. UV-visible absorption spectra of **1** in water (10 % C₂H₅OH) before (black) and after photolysis (red).

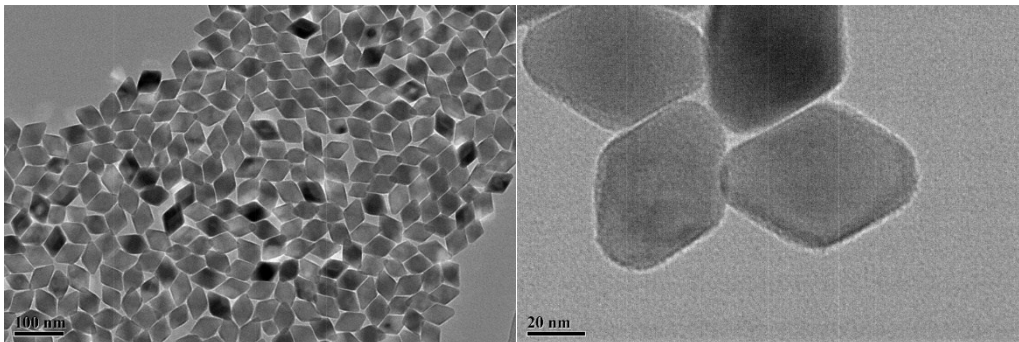


Figure S6. TEM images of oleic acid-capped LiYF₄: Yb/Tm UCNPs.

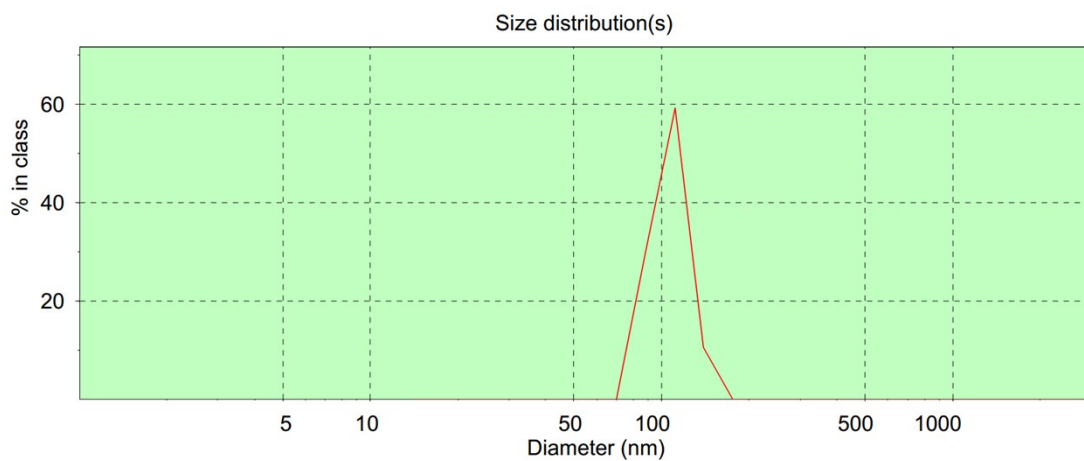


Figure S7. Dynamic light scattering profile of oleic acid-capped LiYF₄: Yb/Tm UCNPs.

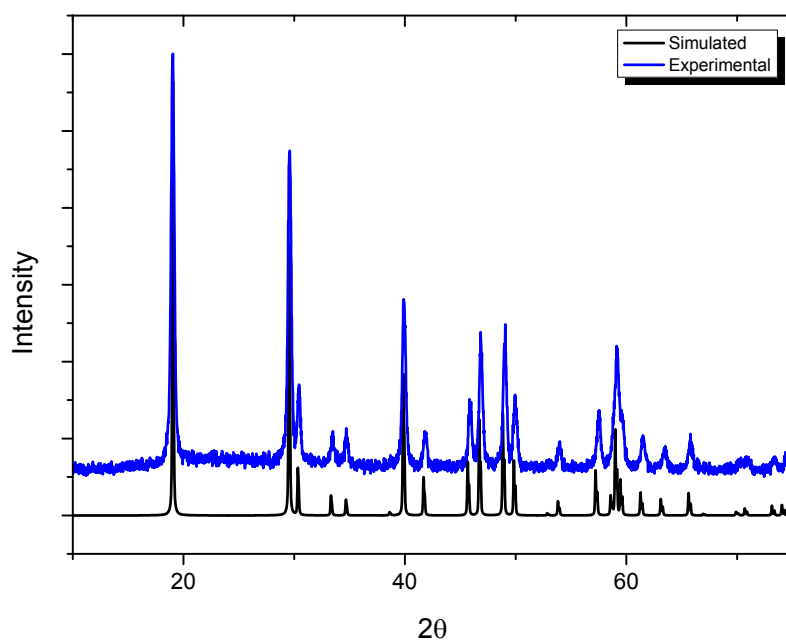


Figure S8. Experimental (blue line) and standard (black line) X-ray diffraction patterns for oleic acid-capped LiYF_4 : Yb/Tm UCNPs.

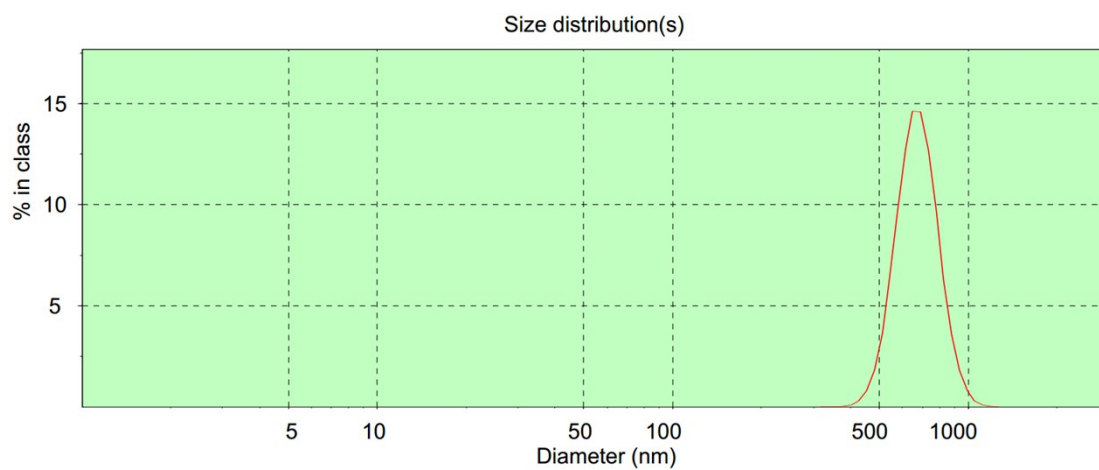


Figure S9. Dynamic light scattering profile of UCNPs@PEG/Ru.

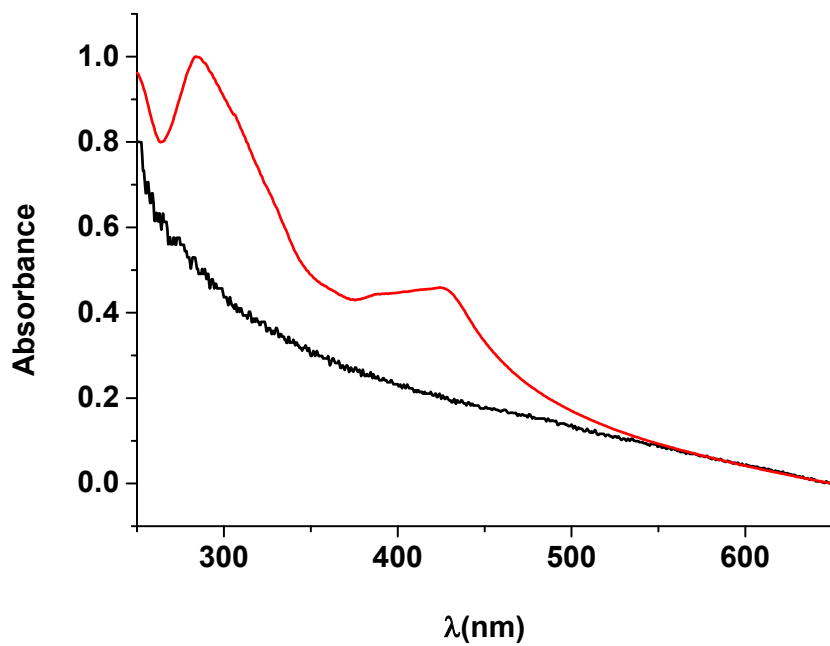


Figure S10. UV-visible absorption spectra of UCNP@PEG (black) and UCNPs@PEG/Ru (red).

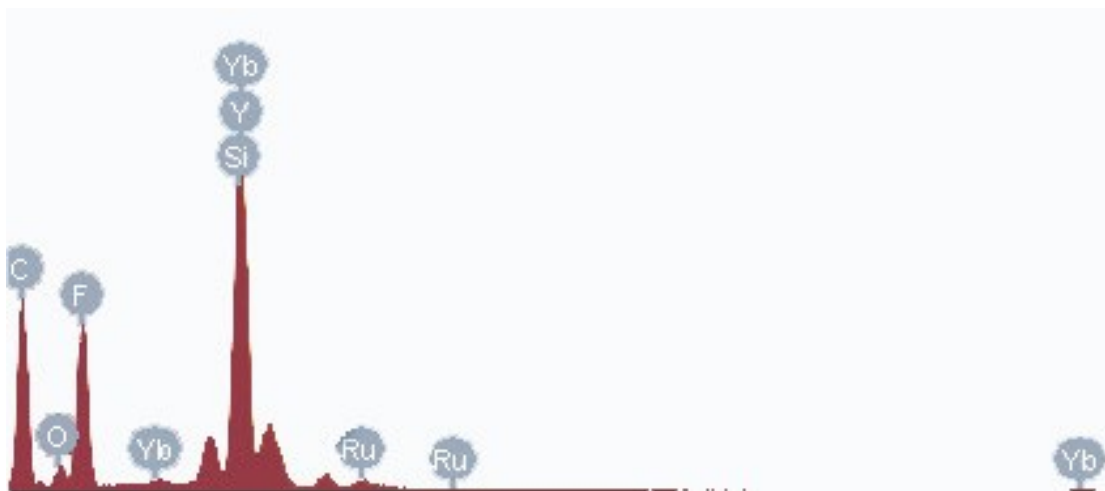


Figure S11. EDS images of UCNPs@PEG/Ru (Si is the base in EDS).

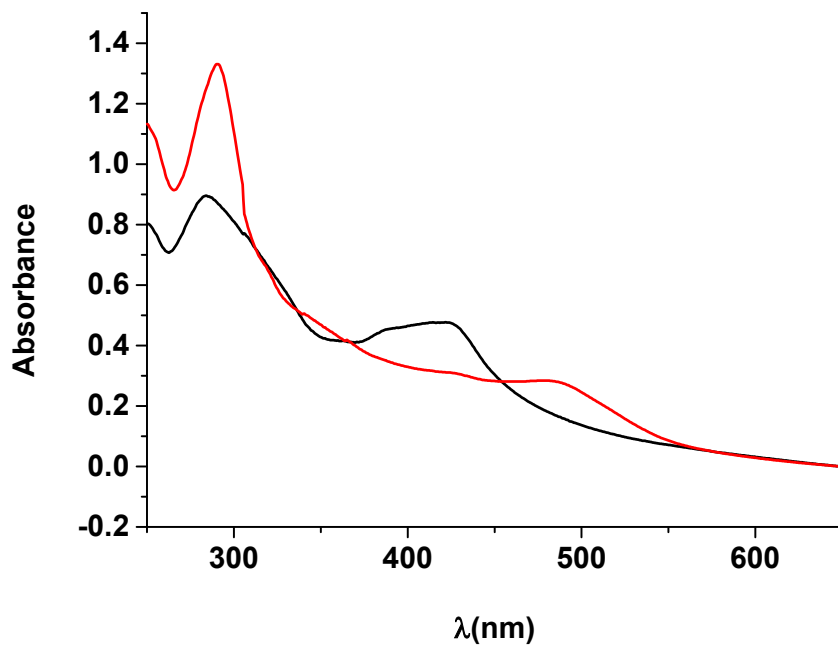


Figure S12. Absorption spectra of **UCNPs@PEG/Ru** before and after visible or NIR light irradiation.

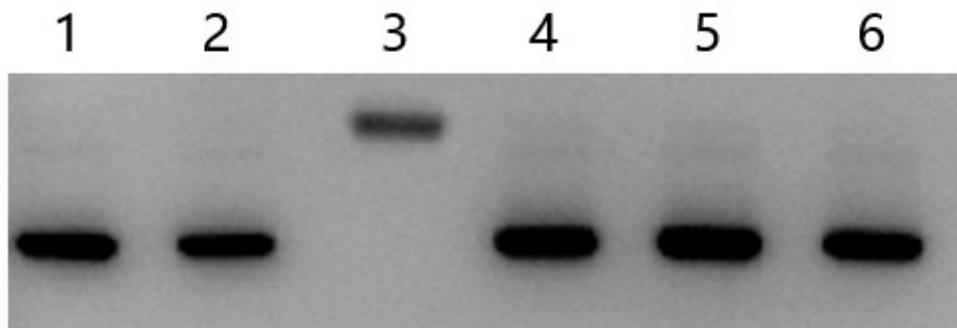


Figure S13. Agarose gel electrophoresis pattern of pUC19 DNA (25 $\mu\text{g}/\text{mL}$ in base pairs) in Tris-EDTA (5 mM, pH = 7.5). Lane 1, DNA alone (dark); lane 2, **1** (dark); lane 3, **1** + light ($\lambda > 400$ nm); lane 4, **UCNPs@PEG** (dark); lane 5, **UCNPs@PEG** + light ($\lambda > 400$ nm); lane 6, DNA alone + light ($\lambda > 400$ nm, $0.07 \text{ W}\cdot\text{cm}^{-2}$).