Nano-graphene oxide-UCNPs-Ce6 covalently constructed nanocomposite for NIR-mediated bioimaging and PTT/PDT combinatorial therapy

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Fig. S1 XRD pattern of core-shell UCNPs. The standard pattern of β -NaGdF₄ is given for comparison (JCPDS No.27-0699).



Fig. S2 Upconversion emission spectra of UCNPs and UCNPs-NH₂ excited with 808 nm laser.



Fig. S3 FT-IR spectra of NGO-PEG and NGO. The strong stretching vibration peak of C–H (\sim 2880 cm⁻¹) demonstrated the presence of PEG in the NGO-PEG. The appearance of the new absorption at \sim 1649 cm⁻¹ for –CONH– further indicated that PEG has been covalently boned on the surface of NGO.



Fig. S4 Temperature variation curves of NGO-PEG solution (0.4 mg/mL) subjected to the 808 nm laser (0.72 W cm⁻²).



Fig. S5 The UV-vis spectra of UCNPs-NGO aqueous solution, NUC aqueous solution and Ce6 in DMSO.



Fig. S6. Cell viability of L929 incubated with NUC.