Supporting Information

Synthesis, Characterization and Application in HeLa cells of NIR Light Responsive Doxorubicin Delivery System Based on $NaYF_4$:Yb,Tm@SiO2-PEG Nanoparticles

Paulino Alonso-Cristobal [(1)], *Olalla Oton-Fernandez* [(1)], *Diego Mendez-Gonzalez*[(1)], *J. Fernando Díaz*[(2)] *Enrique Lopez-Cabarcos*[(1)], *Isabel Barasoain*[(2)] *and Jorge Rubio-Retama*[(1)]*

[(1)] Department of Physical-Chemistry II, Pharmacy Faculty, Complutense University of Madrid, 28040 Madrid, Spain

[(2)] Department of Chemical and Physical Biology, Centro de Investigaciones Biológicas, Consejo Superior de Investigaciones Científicas, Ramiro de Maeztu 9, 28040 Madrid, Spain

Correspondence to: bjrubio@ucm.es

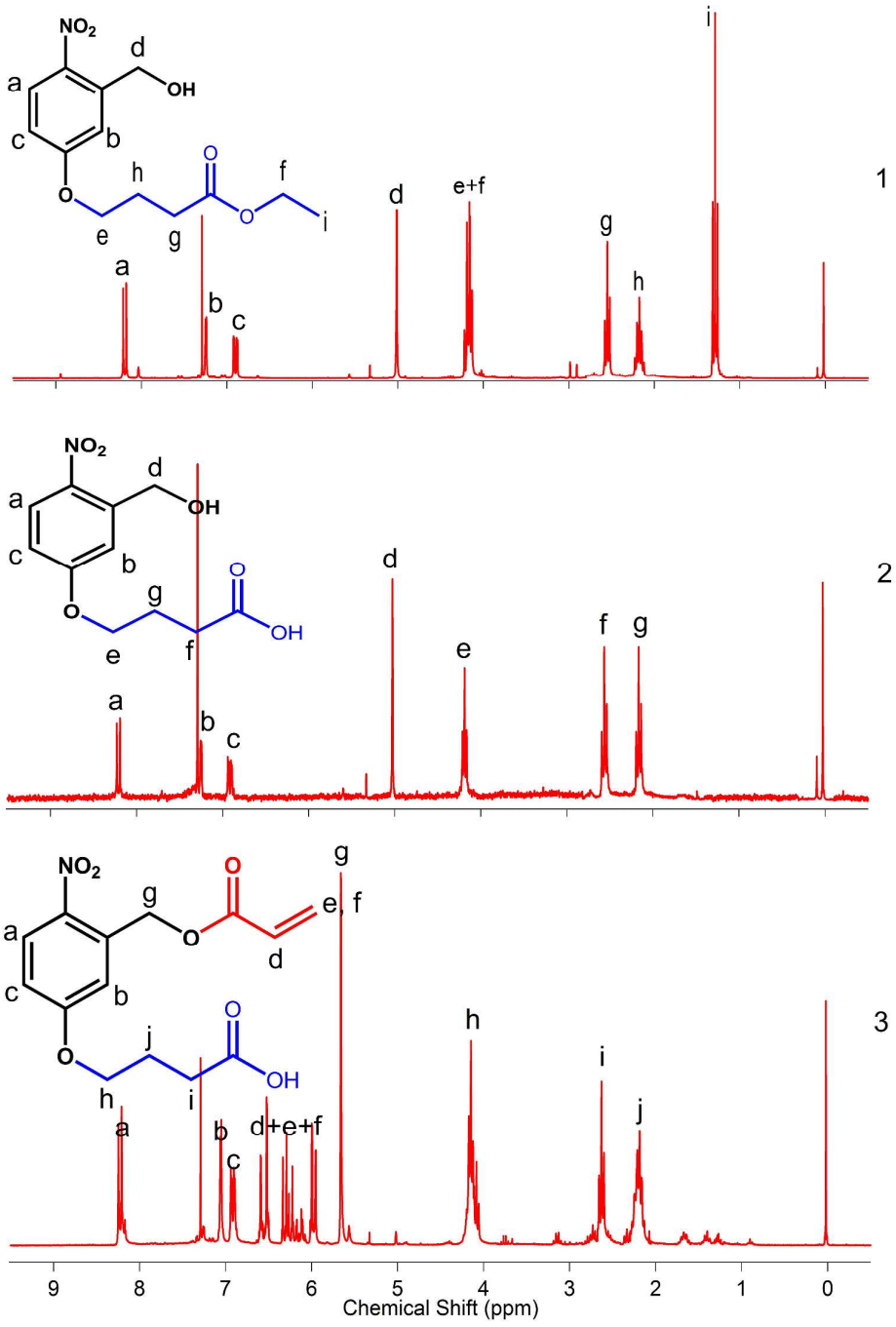

Figure S1. ^{1}H-NMR in $CDCl_3$ of the intermediates synthesized to produce the *o*-NBA derivate.

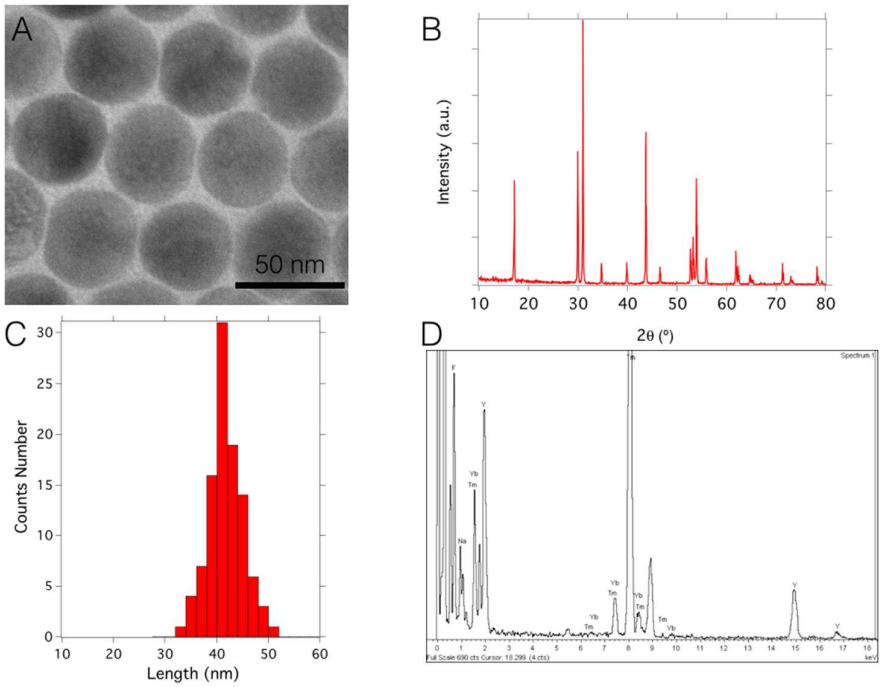

Figure S2. A) Magnified TEM micrograph, B) XRD pattern, C) Nanoparticles length distribution and D) EDX spectrum of the synthesized UCNPs

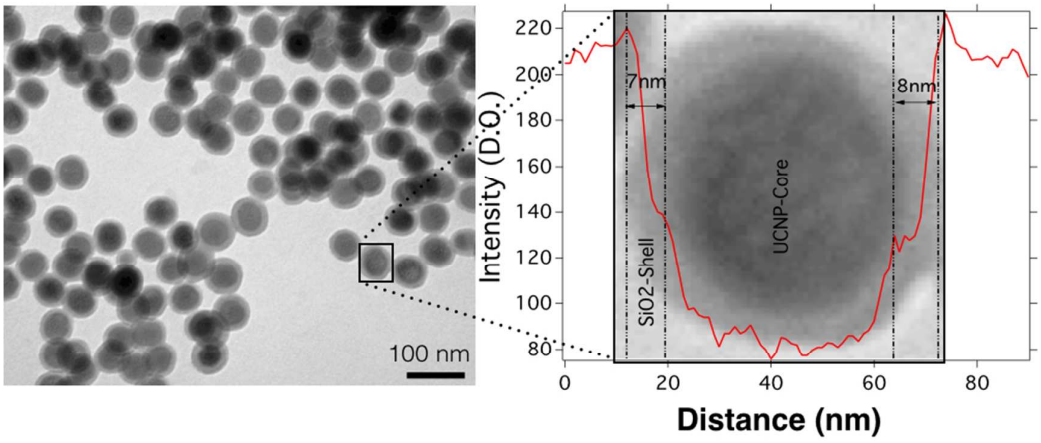

Figure S3. A) TEM micrograph of UCNPs@SiO_2 nanoparticles and B) magnified UCNP@SiO_2 nanoparticle with the profile plot.

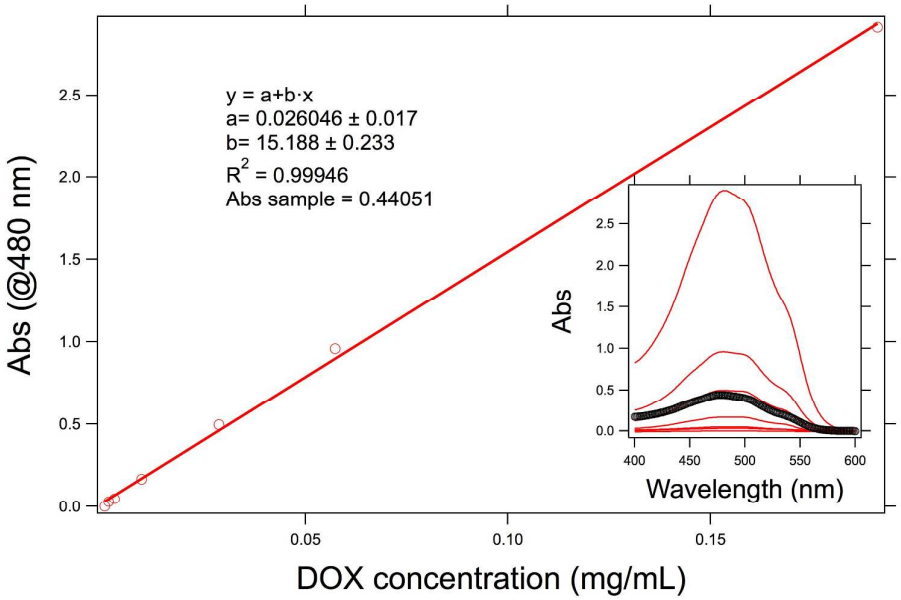

Figure S4. UV-Vis calibration curve of the concentration of doxorubicin in water at 480 nm. The inset shows the absorption spectra of different concentrations of doxorubicin (red curves) and the sample (black curve).

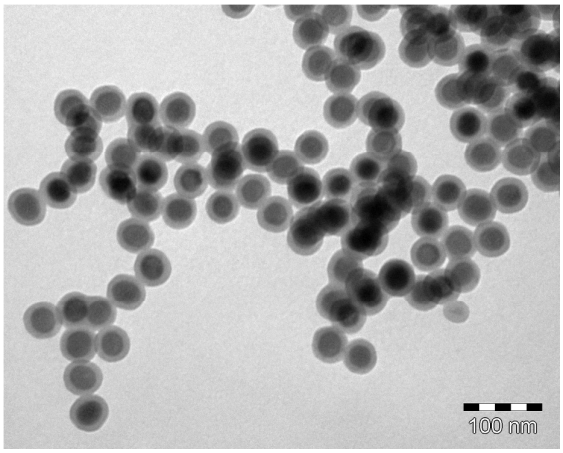

Figure S5. TEM micrograph of the Dox-loaded UCNPs@SiO_2 nanoparticles. The surface chemistry process did not affect the size or the shape of the system

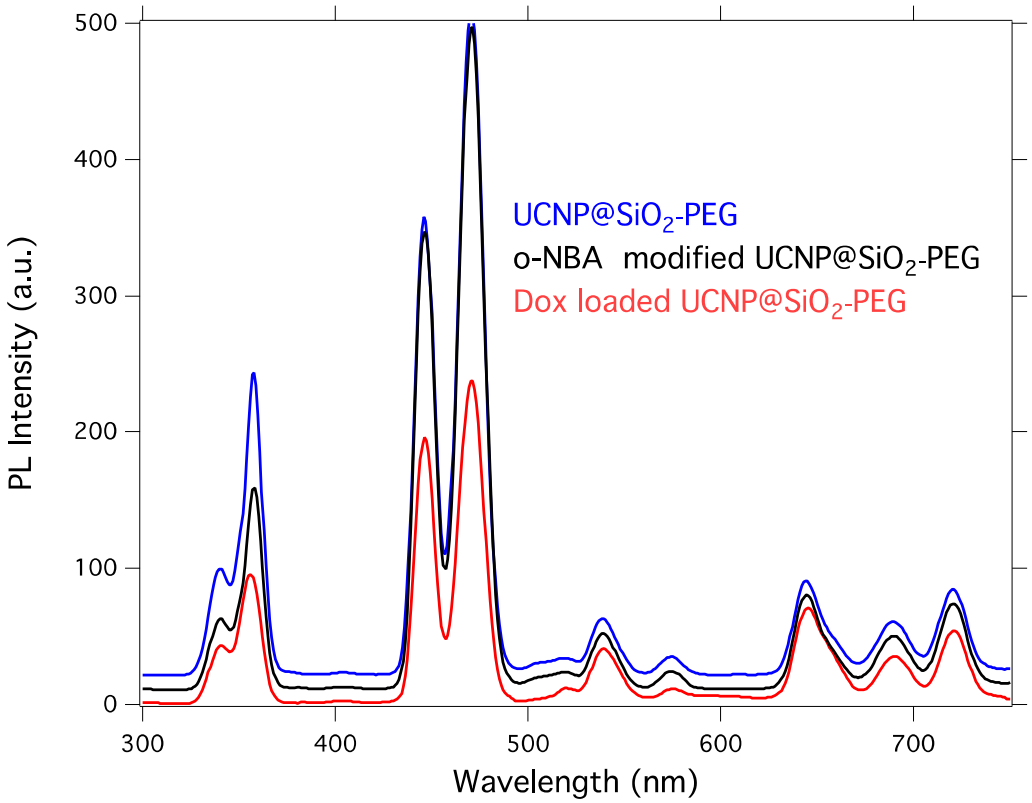

Figure S6. PL emission spectra of (blue) UCNP@SiO_2 nanoparticles, (black) o-NBA modified UCNP@SiO_2 nanoparticles and (red) Dox loaded UCNP@SiO_2 nanoparticles. The excitation wavelenght was 980 nm. All the spectra were normalized with the peak at 800 nm.