Supporting Information

Formation of phosphonate coatings for the improved chemical stability of upconverting nanoparticles under physiological conditions

Maša Vozlič,[a,b] Tina Černič, [a,c] Sašo Gyergyek,[a] Boris Majaron,[d,e] Maja Ponikvar-Svet,[f] Uliana Kostiv,[g] Daniel Horák,[g] and Darja Lisjak* [c]

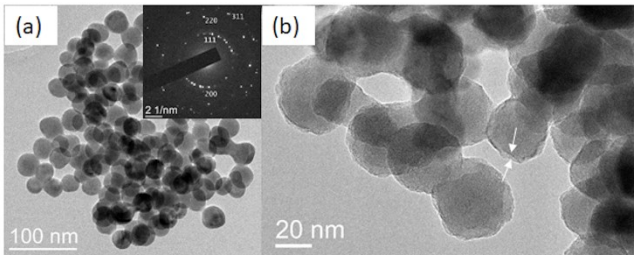

Fig. S1 TEM images of the as-synthesized α-NPs with the corresponding SAED (a), and of the α-NPs coated with the nominal ligand fraction of 10 EDTMP/nm^2 using US agitation for 2 h (b). The indices in the SAED (a) correspond to cubic S.G. $Fm\bar{3}m$ (225). The arrows in (b) indicate the amorphous coating.

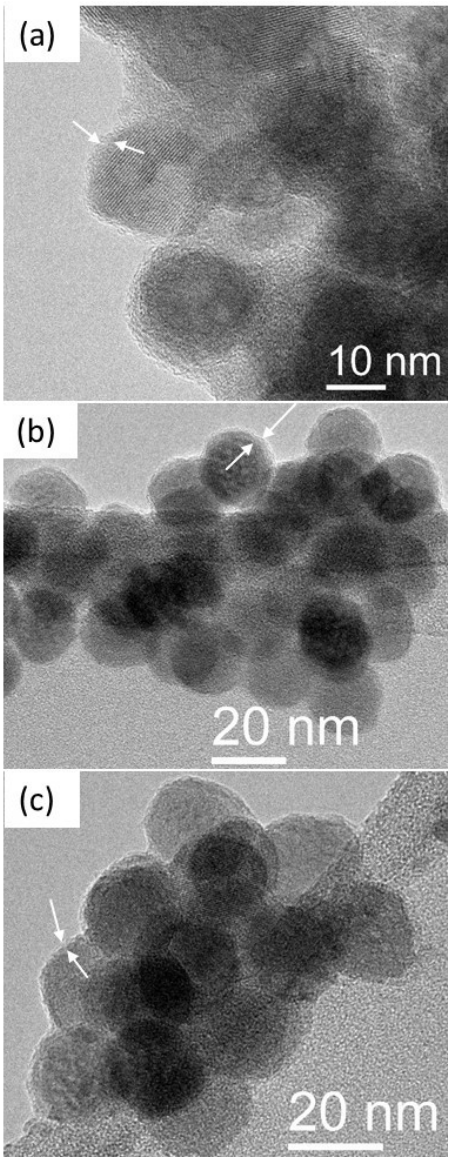

Fig. S2 TEM images of coated β-UCNPs with EDTMP (a), AL (b) and PEG-Ner (c). All β-UCNPs were coated with nominal ligand fraction 10 molecules/nm^2. The EDTMP coating (a) was prepared in US bath and the other two coatings (b and c) were obtained at 80 °C. Arrows point to the amorphous coating.

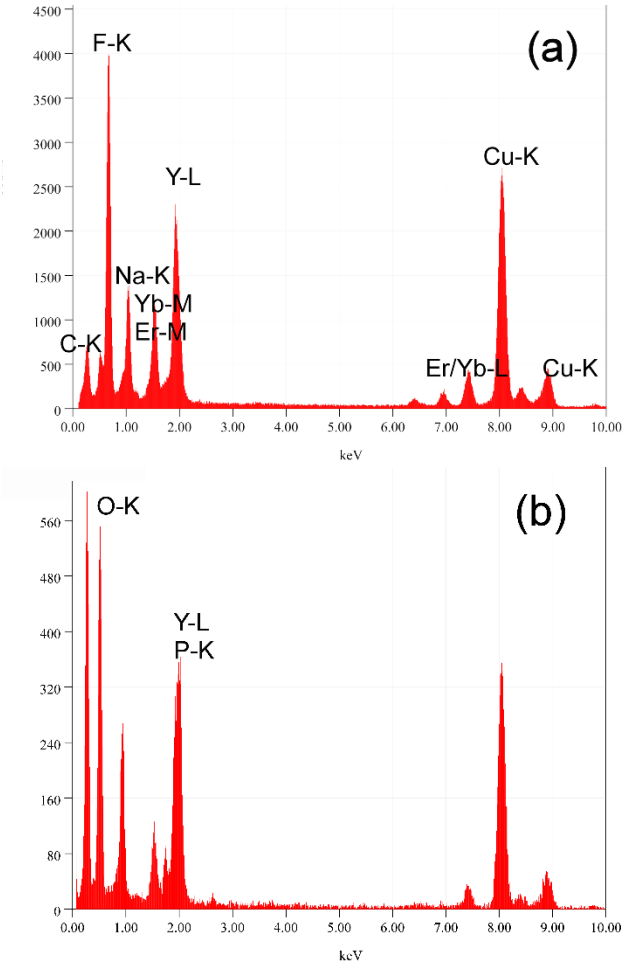

Fig. S3 EDXS spectra of the bare β-UCNPs (a) and β-UCNPs@EDTMP (b). Cu-K and C-K peaks originate from the TEM supporting grid but in the panel (b) C-K peak also originates from the coating.

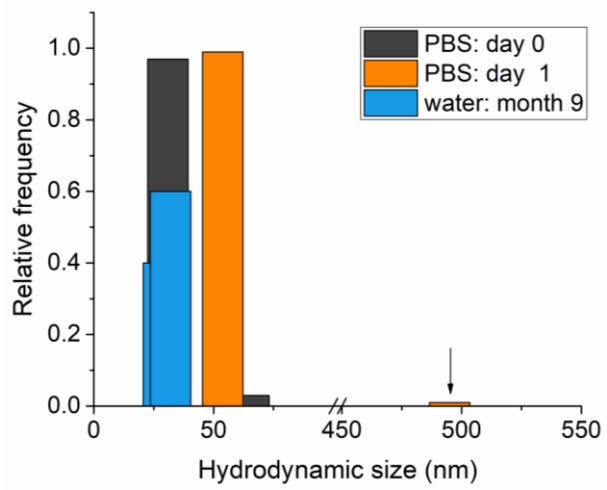

Fig. S4 Number-weighted hydrodynamic-size distribution of the UCNPs@PEG-Ner (made at 80 °C) in PBS and water. An arrow points at the large size fraction, measured 1 day after the immersion of UCNPs@PEG-ner in PBS.