

Supplementary materials

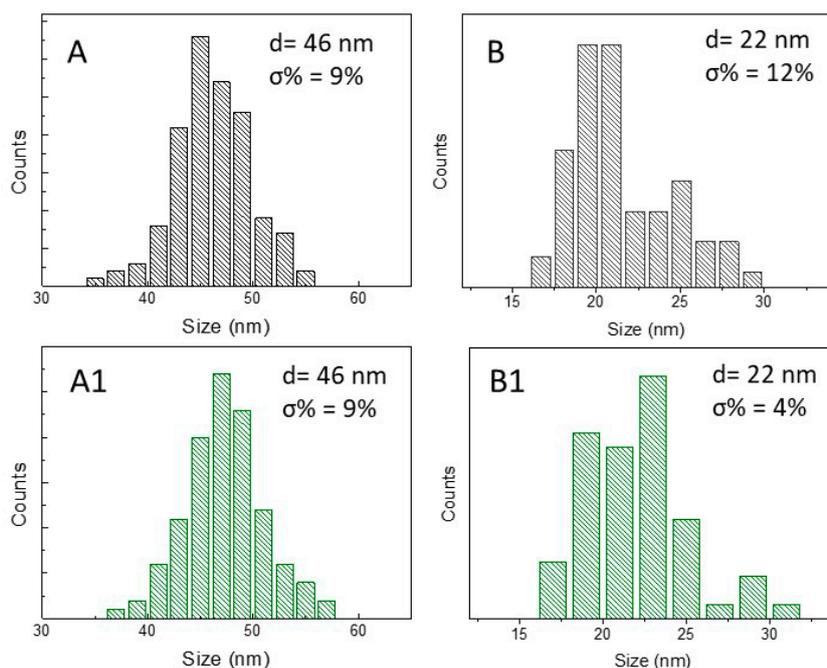


Figure S1. Statistical analysis of the size of the Tb^{III}-TCAS doped SN NP samples measured from TEM micrographs. Amino functionalized silica sample SN46 (A), SN22 (B) and TSPO ligand conjugated SN 46 (A1) and SN22 (B1).

Table S1. ICP-OES data of the synthesized Tb(III) doped silica nanoparticles ($C_{SNs}=0.2 \text{ g L}^{-1}$).

Sample	Element content mg L^{-1} , $\pm 10\%$	
	Si (251.611 nm)	Tb (350.917 nm)
SN22	89.5	1.18
SN46	75.5	3.22

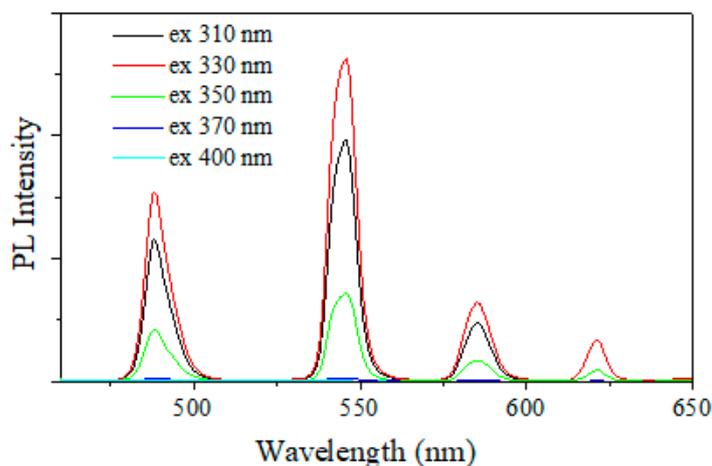


Figure S2. PL spectra of Tb^{III} doped silica nanoparticles at different excitation wavelength

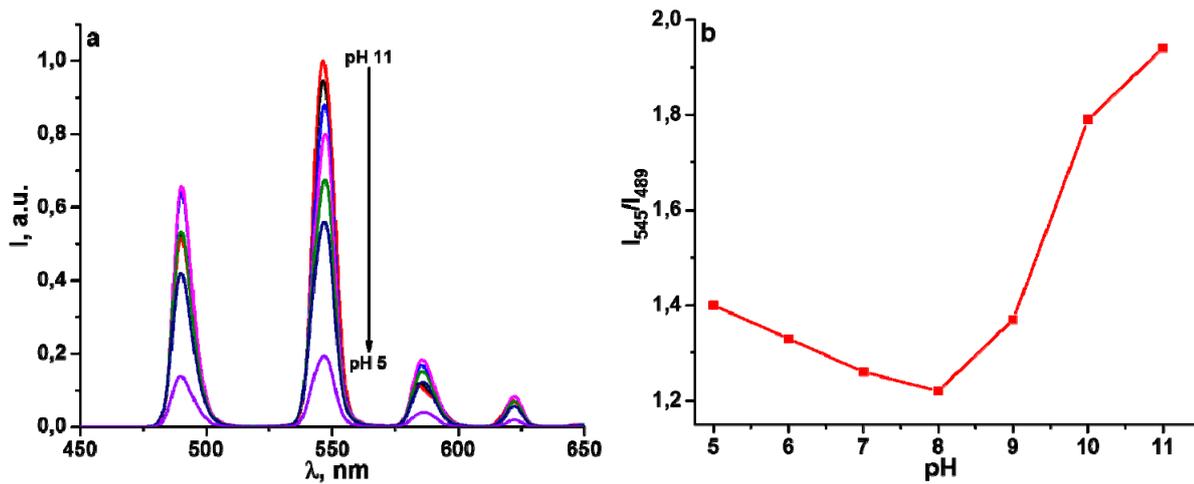


Figure S3. Luminescence spectra (a) and ratio of luminescence intensity at 545 and 489 nm (b) of Tb^{III}-TCAS complex (0.1 mM) at various pH of aqueous solution (pH was adjusted by NaOH).

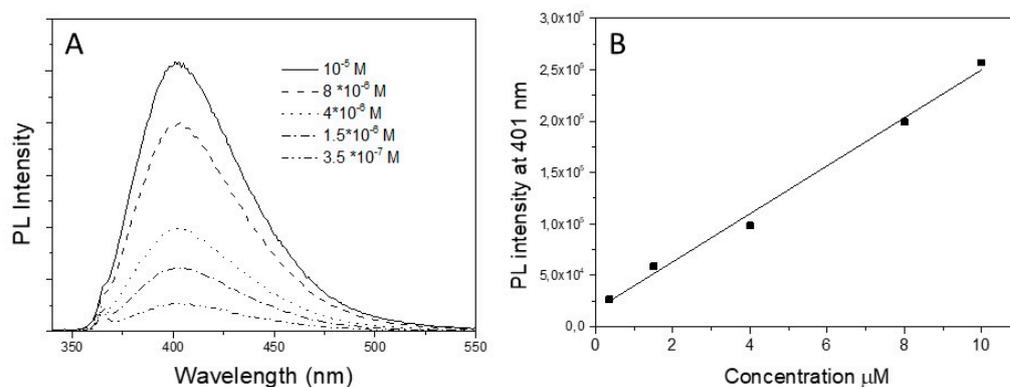


Figure S4. PL spectra (A) and calibration curve (B) reporting the PL intensity at 401 nm versus the TSPO ligand concentration.