Rare-Earth Doped Particles as Dual-Modality Contrast Agent for Minimally-Invasive Luminescence and Dual-Wavelength Photoacoustic Imaging

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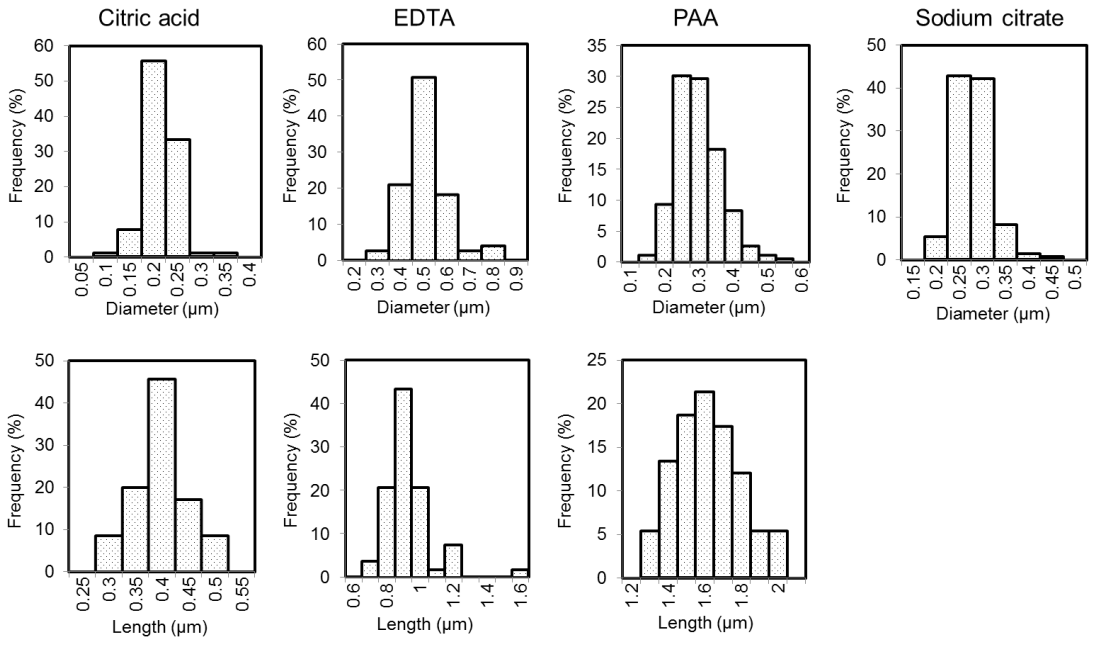

Figure S1 Size distribution of $NaYF_4$:Yb,Er particles synthesized with surfactants of citric acid, PAA, EDTA and sodium citrate (Ln:Surf = 1:10 mol/mol).

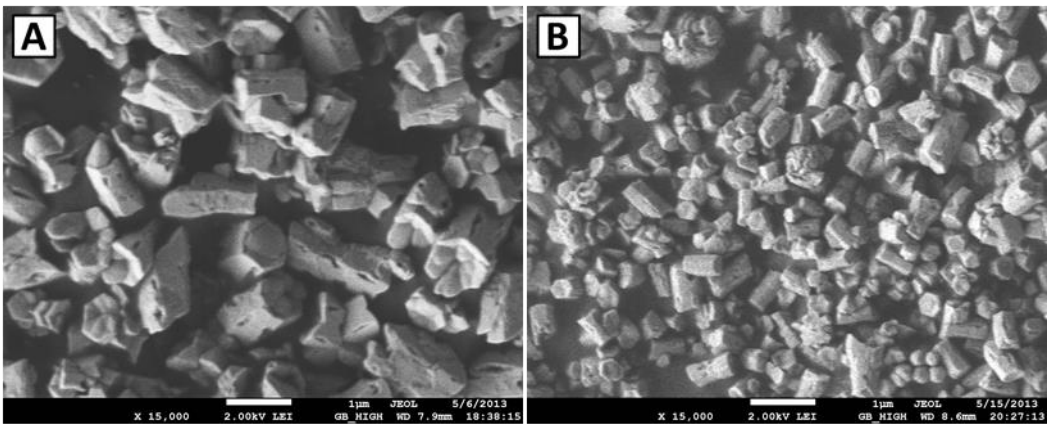

Figure S2 SEM images of $NaYF_4$:Yb,Er short rods prepared with citric acid, where Ln:citric acid = (A) 1:1 and (B) 1:5 mol/mol.

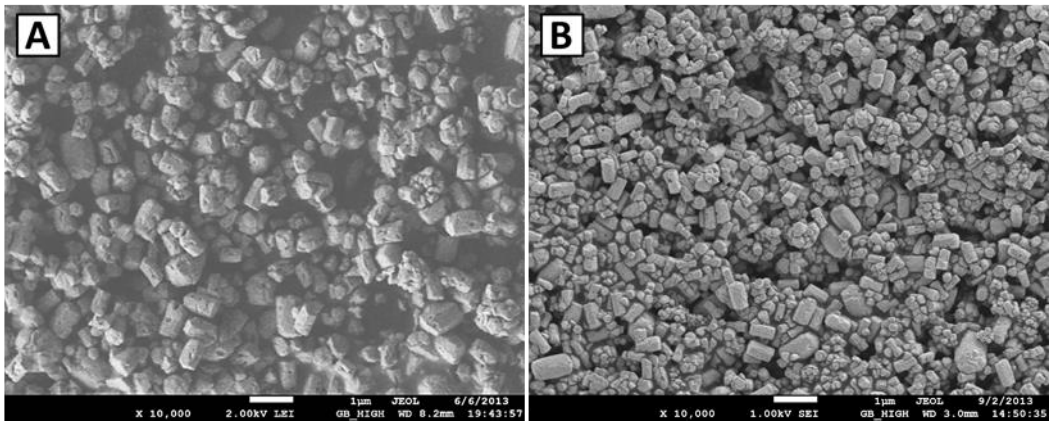

Figure S3 SEM images of $NaYF_4$:Yb,Er short rods prepared with EDTA, where Ln:EDTA = (A) 1:1 and (B) 1:5 mol/mol.

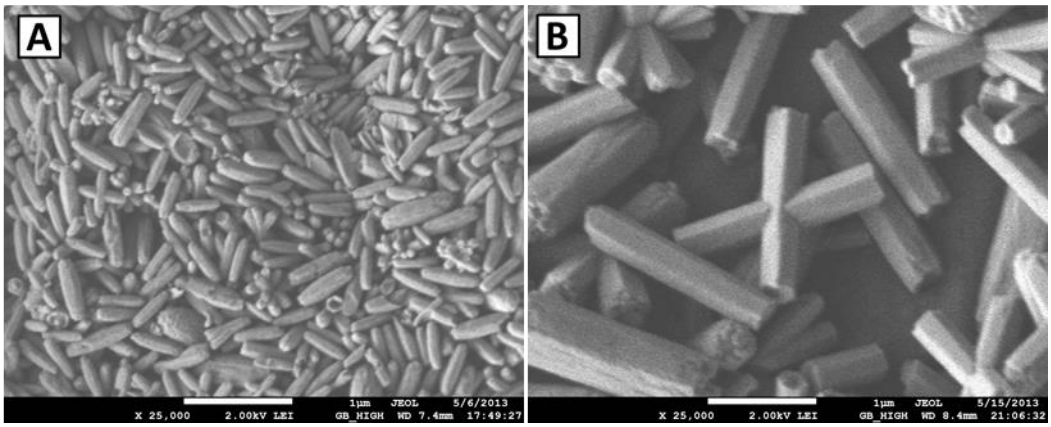

Figure S4 SEM images of $NaYF_4$:Yb,Er rods prepared with PAA, where Ln:PAA = (A) 1:1 and (B) 1:5 mol/mol.

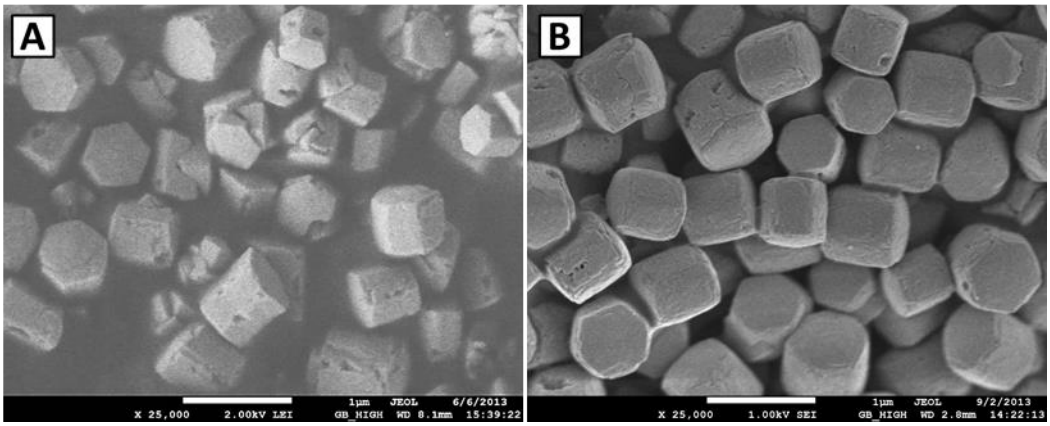

Figure S5 SEM images of $NaYF_4$:Yb,Er hexagons prepared with sodium citrate, where Ln:sodium citrate = (A) 1:1 and (B) 1:5 mol/mol.

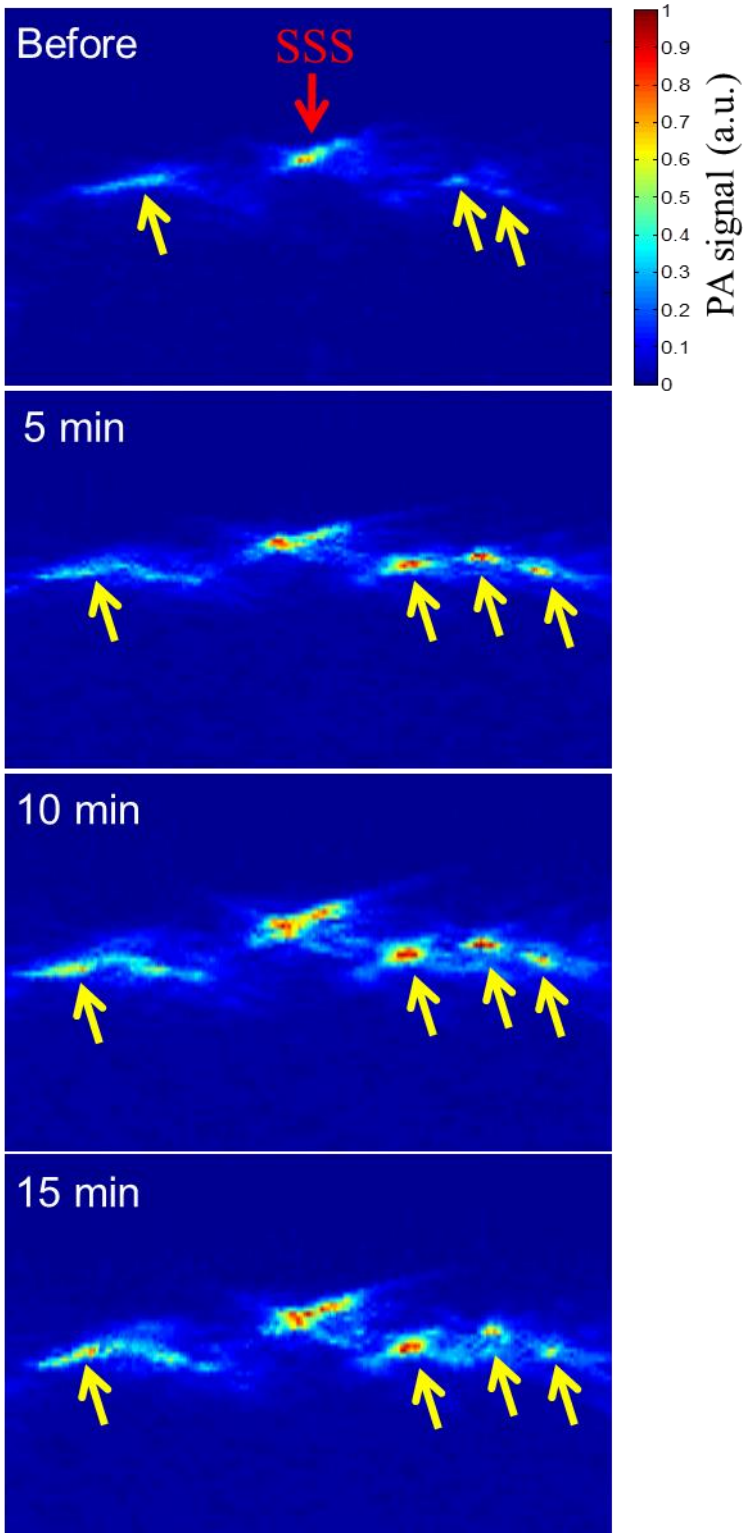

Figure S6 Photoacoustic images of the rat's blood vessels around the superior sagittal sinus (SSS) at different times after the injection of $NaYF_4$:Yb,Er particles.

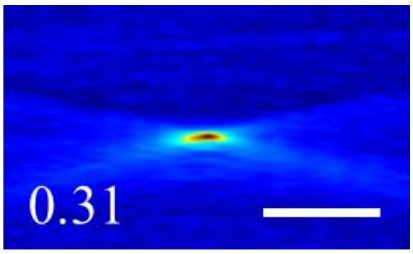

Figure S7 PA images and signals measured upon excitation at 975 nm for nano-sized $NaYF_4$:Yb,Er/$NaYF_4$ particles at the concentration of 33.3 mg/mL. (Scale bar: 100 μm)

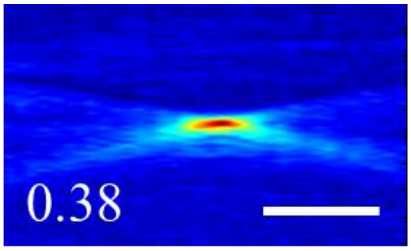

Figure S8 PA images and signals of $NaYF_4$:Yb,Tm particles measured upon excitation at 800 nm. (Scale bar: 100 μm)