Supporting Information

Gadolinium Labeled Ferritin Nanoparticles as T_1 Contrast Agents for Magnetic Resonance Imaging of Tumors

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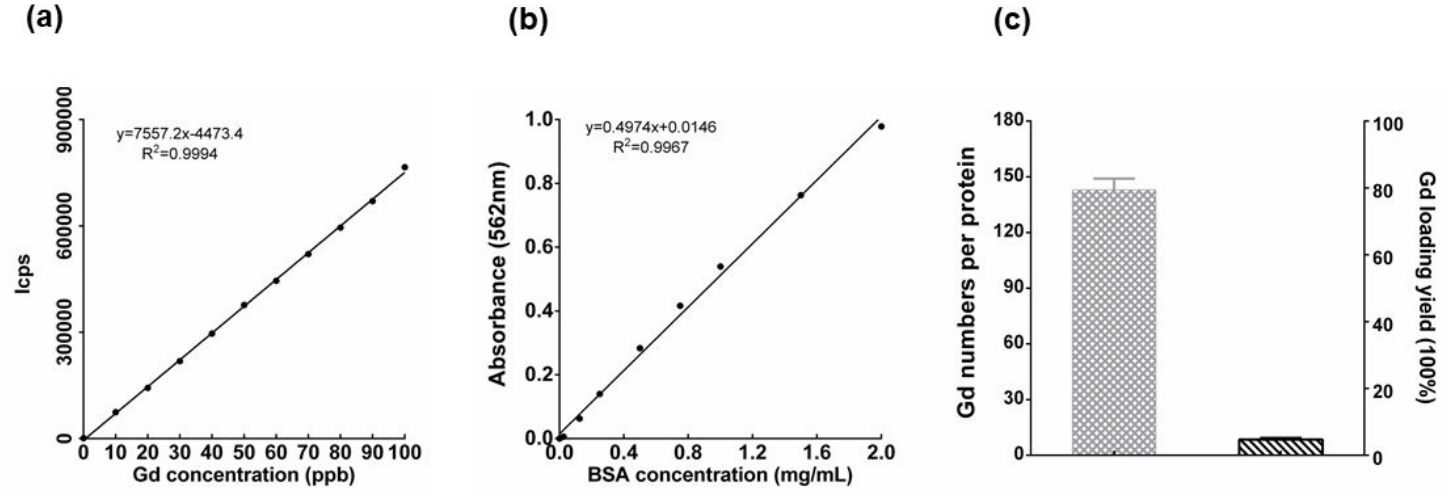

Figure S1. (a) Standard Gd calibration curve analyzed by ICP-MS. (b) Protein concentration measurment by using Bicinchoninic acid (BCA) protein assay reagent with bovine serum albumin as the standard. (c) Gd numbers per protein and Gd loading efficiency on HFn.

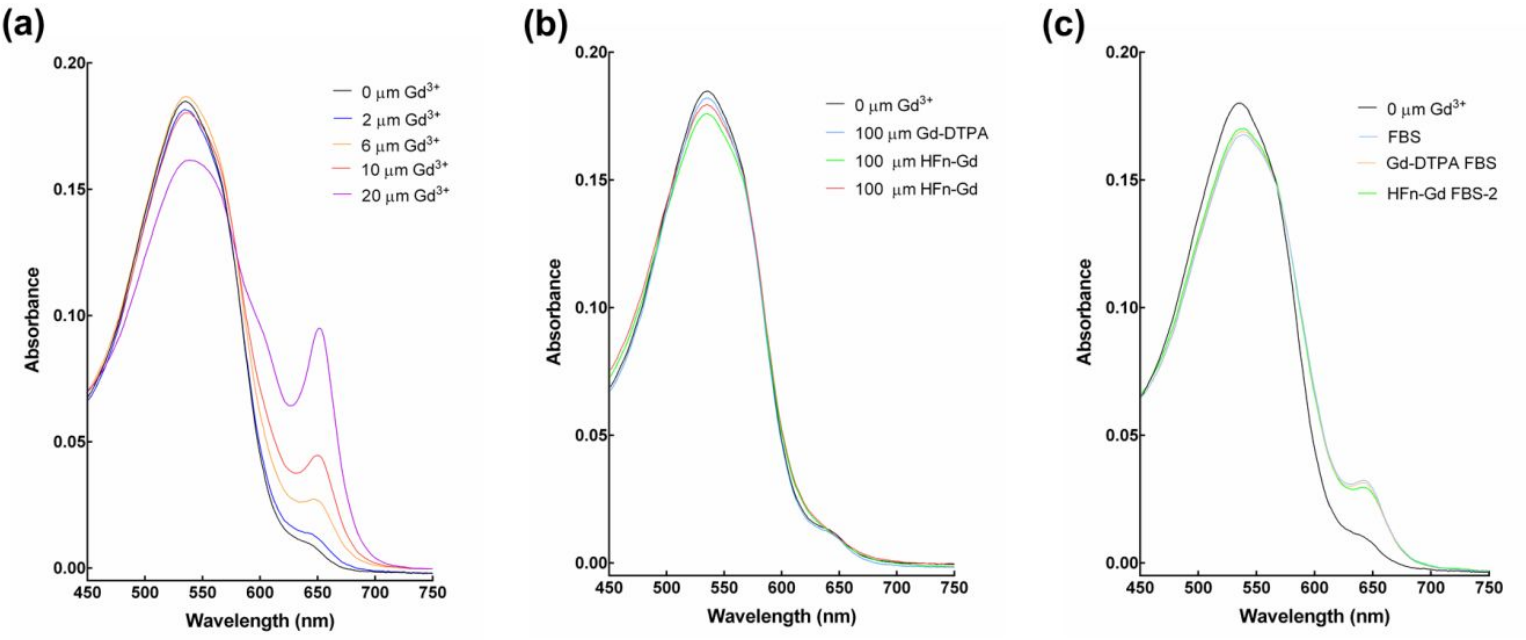

Figure S2. Absorption spectrum of arsenazo (III) solution with different mole ratios of Gd ions (a), and Gd-DTPA (blue); fresh prepared HFn-Gd (green); HFn-Gd kept in 4 ℃ for 2 months (orange) in (b), FBS (blue); Gd-DTPA incubated with FBS (orange); HFn-Gd incubated with FBS (green) in (d).

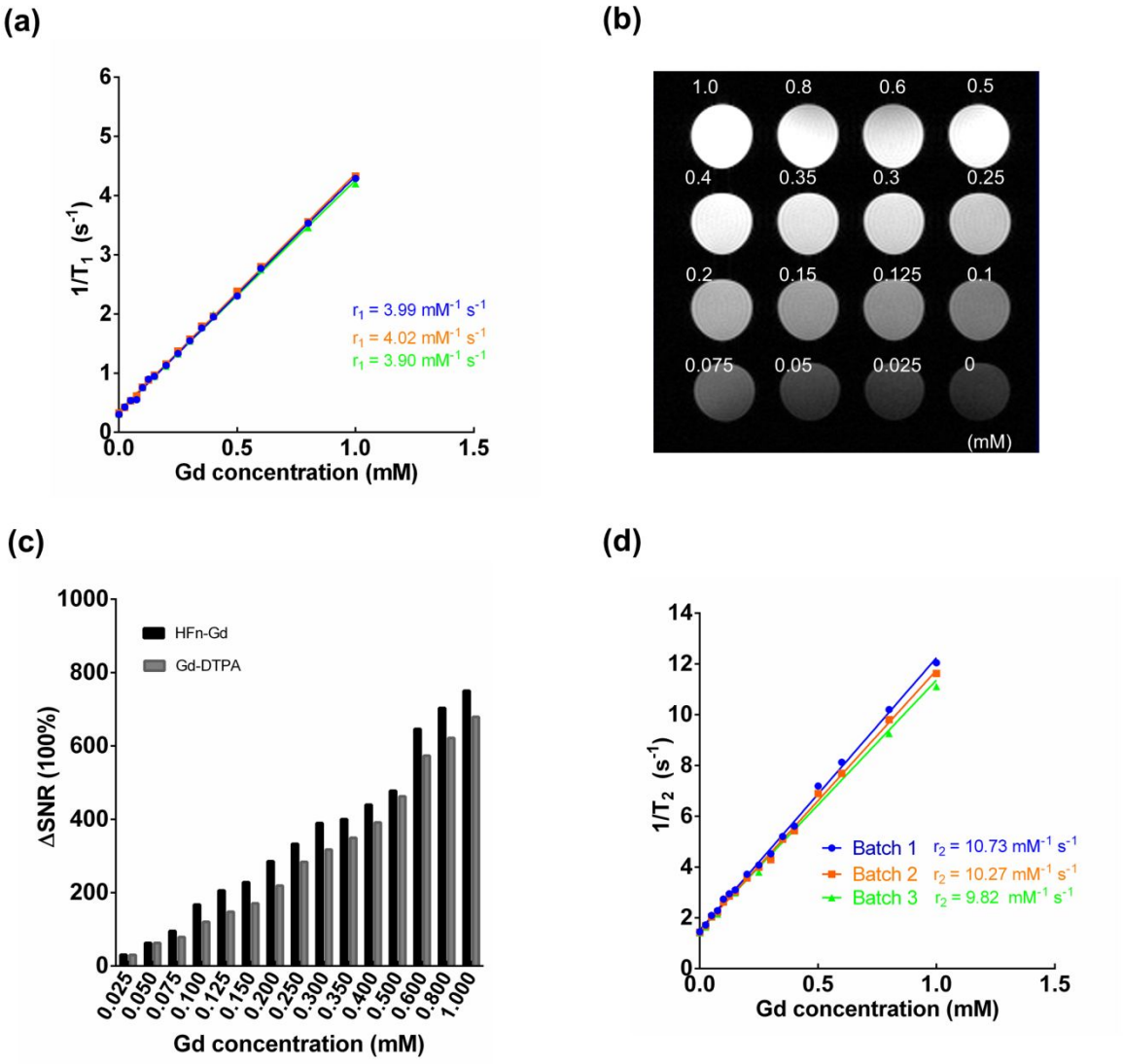

Figure S3. (a) Analysis of r_1 relaxivity of Gd-DTPA. (b) MRI imaging of Gd-DTPA. (c): ΔSNR of MR images of HFn-Gd and Gd-DTPA with various Gd concentrations. (d) r_2 relaxivity of HFn-Gd by linear mapping Gd concentration and relaxation rate.

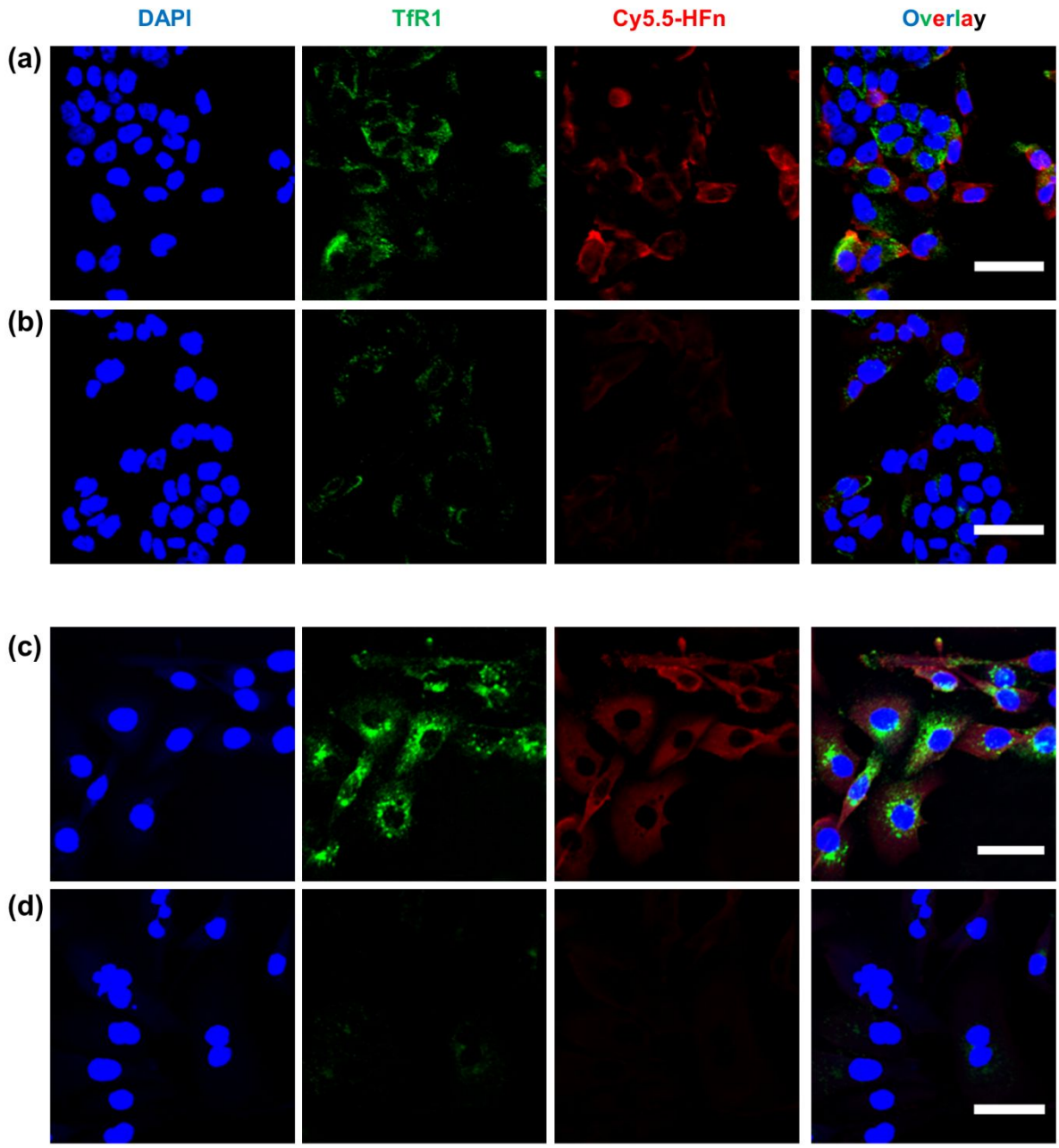

Figure S4. (a) Fluorescence images of CFPAC-1 cancer cells treated with FITC labeled TfR1 and Cy5.5 labeled HFn. (b) Fluorescence images of CFPAC-1 cancer cells which were first incubated with TfR1 antibody and then treated with FITC labeled TfR1 and Cy5.5 labeled HFn. (c) Fluorescence images of MDA-MB-231 cancer cells treated with FITC labeled TfR1 and Cy5.5 labeled HFn. (d) Fluorescence images of MDA-MB-231 cancer cells which were first incubated with TfR1 antibody and then treated with FITC labeled TfR1 and Cy5.5 labeled HFn. Cell nuclei were all counterstained with DAPI. Scale bar: 50 μm.

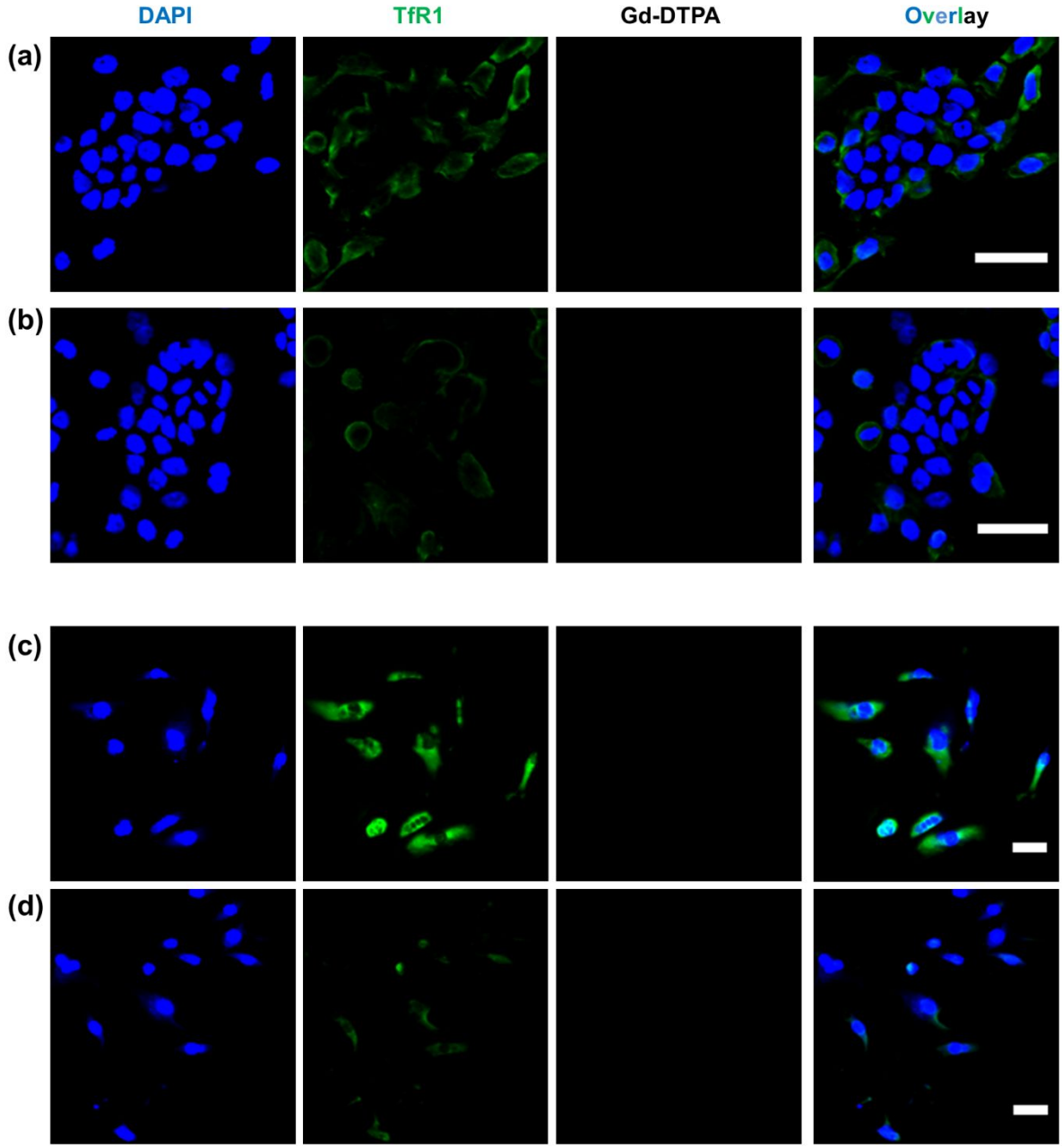

Figure S5. (a) Fluorescence images of CFPAC-1 cancer cells treated with FITC labeled TfR1 and Gd-DTPA. (b) Fluorescence images of CFPAC-1 cancer cells which were first incubated with TfR1 antibody and then treated with FITC labeled TfR1 and Gd-DTPA. (c) Fluorescence images of MDA-MB-231 cancer cells treated with FITC labeled TfR1 and Gd-DTPA. (d) Fluorescence images of MDA-MB-231 cancer cells which were first incubated with TfR1 antibody and then treated with FITC labeled TfR1 and Gd-DTPA. Cell nuclei were all counterstained with DAPI. Scale bar: 50 μm.

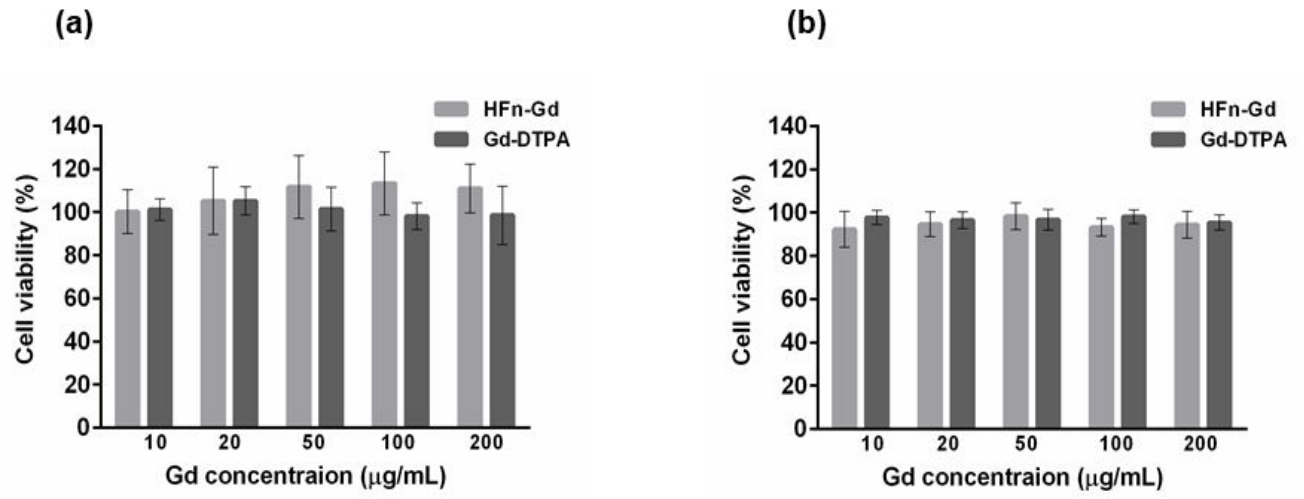

Figure S6. No obvious effects of HFn-Gd on cell viability in either CFPAC-1 (a) or MDA-MB-231cells (b) were observed. Cell viability was measured by using a cell counting kit. These experiments were performed in quintuplicate. Results are representative of three independent experiments. Error bars represent standard deviations.

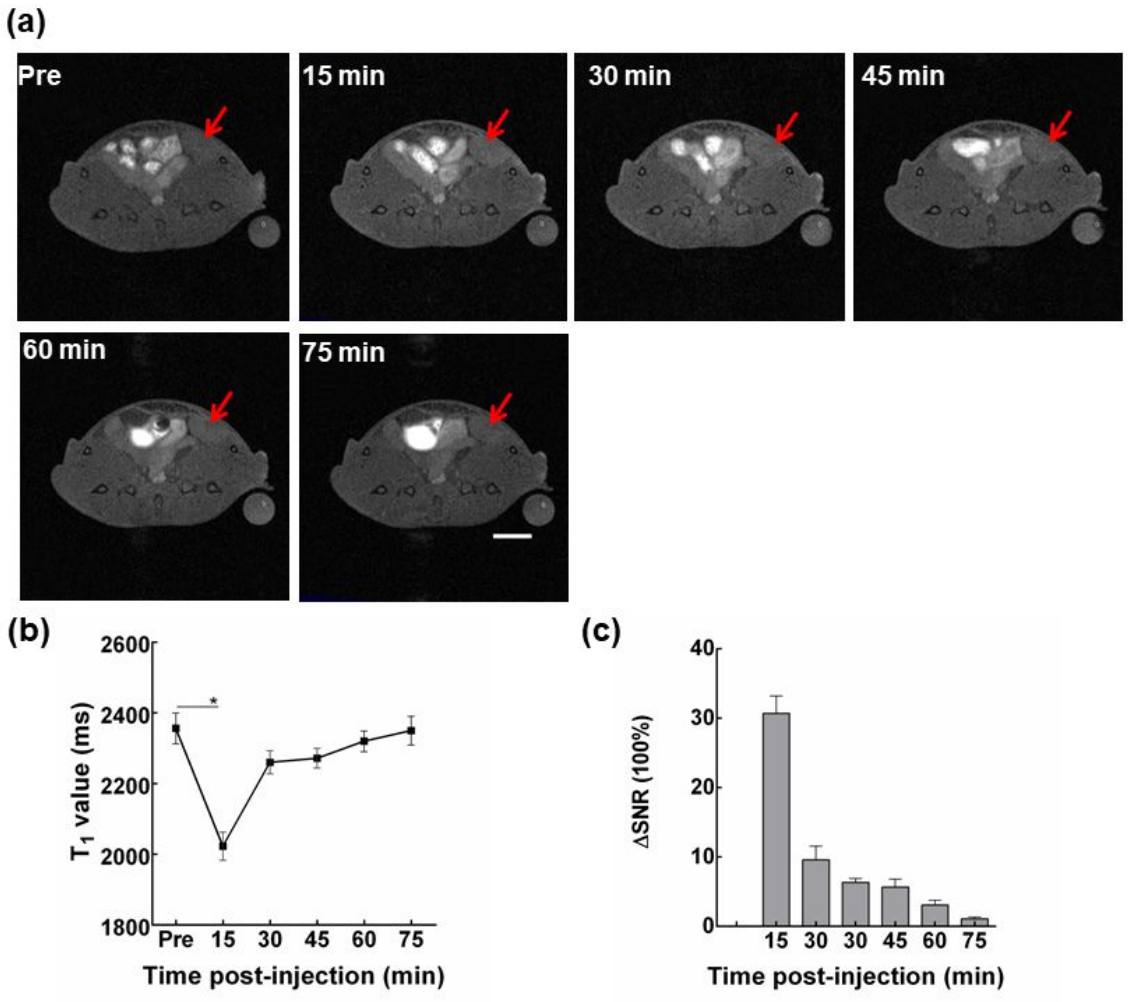

Figure S7. (a) Representative T_1-weighted MR images of a mouse exhibiting CFPAC-1 tumor before and after injection of HFn-Gd nanoparticles. (b) The Quantitative analysis of T_1 values of tumors. Scale bar: 0.5cm. (c) Signal changes which are quantified using ΔSNR in tumors at different time points after contrast administration of HFn-Gd nanoparticles.

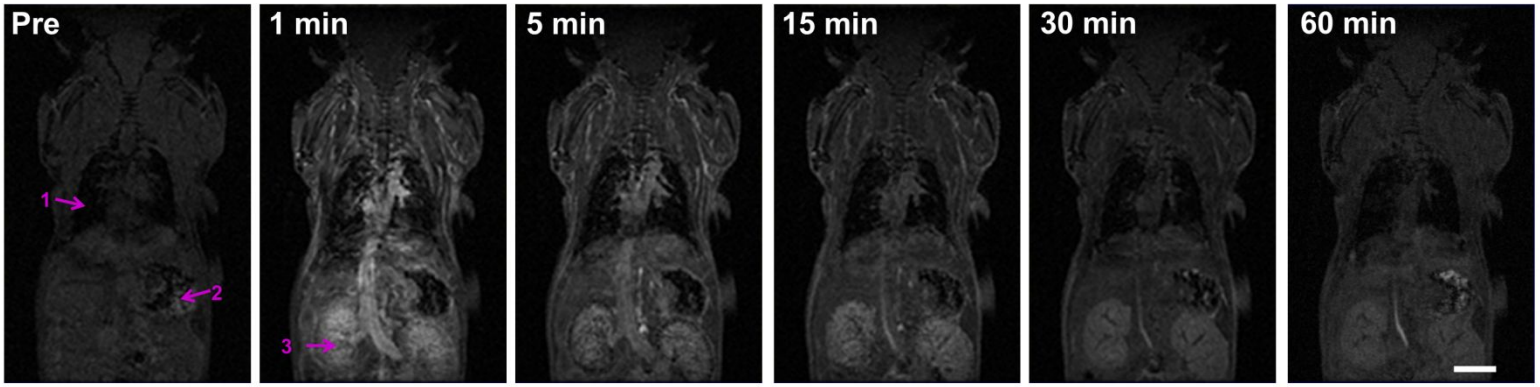

Figure S8. *In vivo* T_1-weighted MR images of the mice before and after the intravenous injection of Gd-DTPA. 1: lung, 2: stomach, 3: kidney. Scale bar: 0.5 cm.