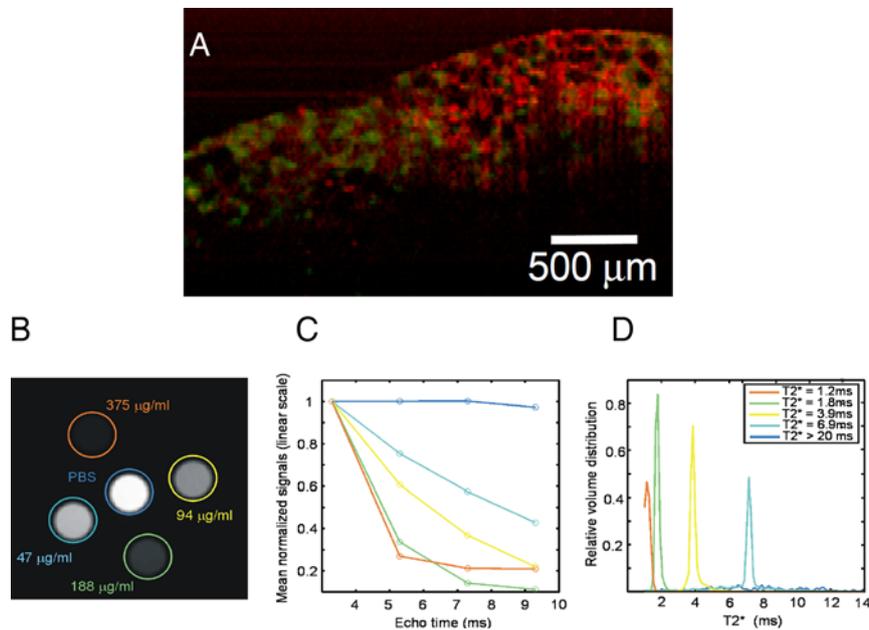
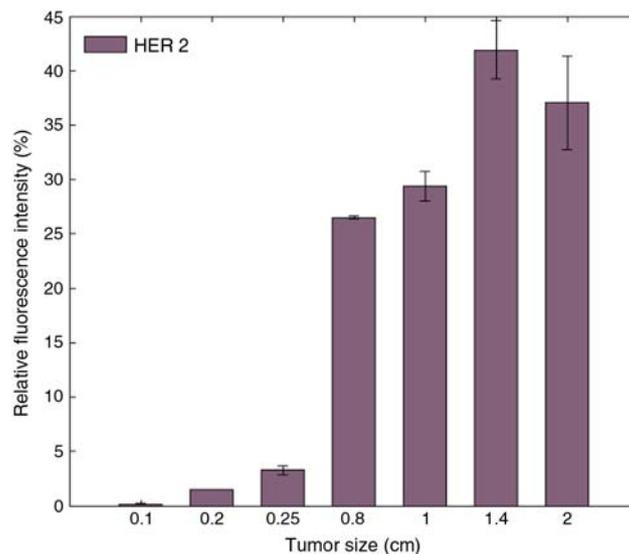


# Supporting Information

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**Fig. S1.** (A) Magnetomotive optical coherence tomography (MM-OCT) image of a mammary tumor soaked in 1 mg/mL solution of dextran-coated MNPs for 1 h. MM-OCT signal (green channel) is superposed over the structural optical coherence tomography image (red channel). (B) A transverse slice from an MRI 3D dataset of vials containing different concentrations of MNPs in PBS solution. (C) Normalized signal decay curves vs. echo time. (D) Corresponding plot of T2\* values present within the segmented 3D volumes marked in B. MRI was performed on a 14-T system. (Note that the decay curve for the pure PBS is too gradual to enable an accurate measurement for T2\*.)



**Fig. S2.** Tumor marker expression levels in MNU-induced rat mammary tumor model. Quantitative analysis of relative fluorescence intensity from immunostained tumor sections show *HER2* expression levels vs. tumor size. The error bars represent standard deviations from mean values.