Supporting Information

Beyond the Roles in Biomimetic Chemistry: An Insight into the Intrinsic Catalytic Activity of an Enzyme for Tumor-Selective Phototheranostics

Weitao Yang [a], Xiudong Shi [b], Yuxin Shi [b], Defan Yao [a], Shizhen Chen [c], Xin Zhou [c], and Bingbo Zhang [a,*]

[a] *Institute of Photomedicine, Shanghai Skin Disease Hospital, The Institute for Biomedical Engineering & Nano Science, Tongji University School of Medicine, Shanghai 200443, China*

[b] *Department of Radiology, Shanghai Public Health Clinical Center, Fudan University, Shanghai 201508, China*

[c] *Key Laboratory of Magnetic Resonance in Biological Systems, State Key Laboratory of Magnetic Resonance and Atomic and Molecular Physics, National Center for Magnetic Resonance in Wuhan, Wuhan Institute of Physics and Mathematics, Chinese Academy of Sciences, Wuhan 430071, China*

Corresponding Authors

* Bingbo Zhang, Email: bingbozhang@tongji.edu.cn

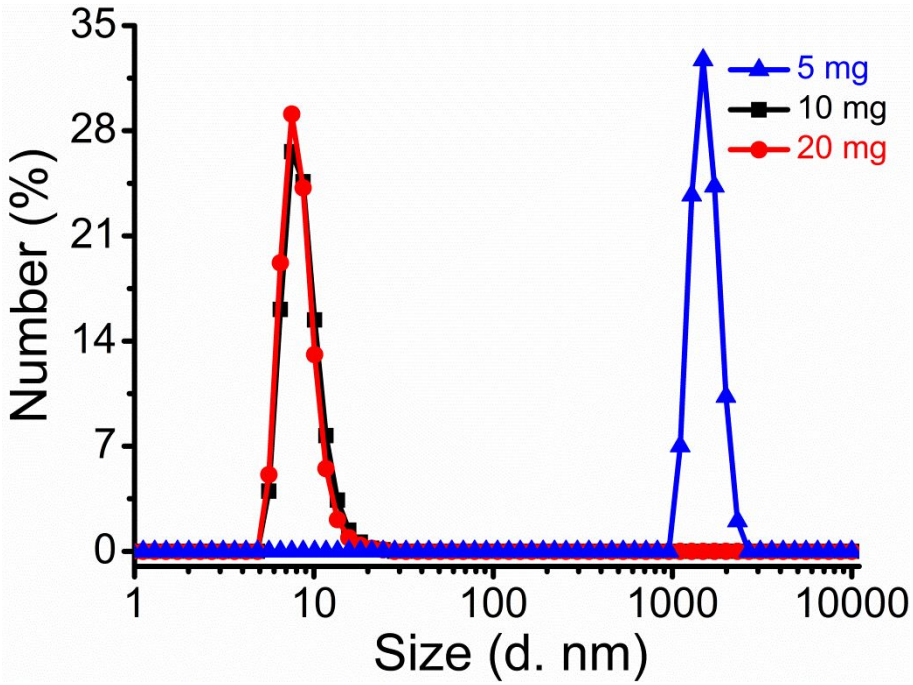

Figure S1. Hydrodynamic sizes of Gd@HRP^{ABTS} nanodots prepared at different amounts of HRP (5 mg, 10 mg, and 20 mg).

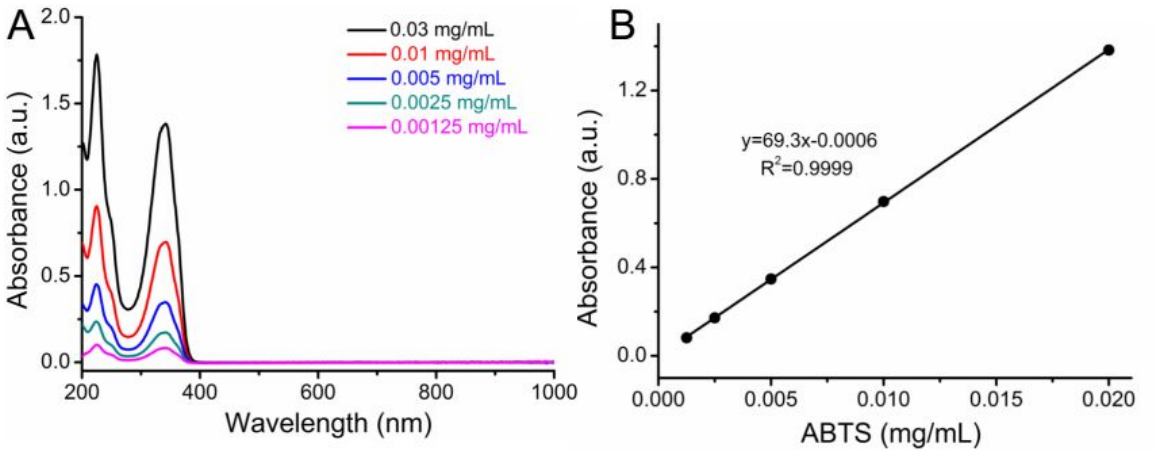

Figure S2. (A) UV-Vis absorption spectra of ABTS at different concentrations. (B) The linear fitting curve of ABTS concentration *versus* absorption at 342 nm.

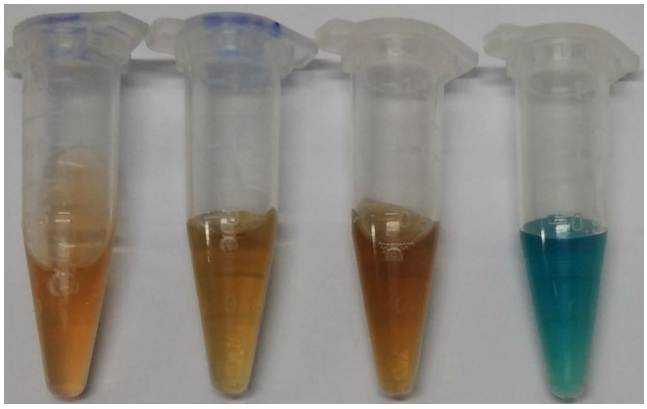

Figure S3. Digital pictures of HRP, Gd@HRP, Gd@HRP^{ABTS}, and Gd@HRP^{ABTS}+H_2O_2 (100 μM) from left to right.

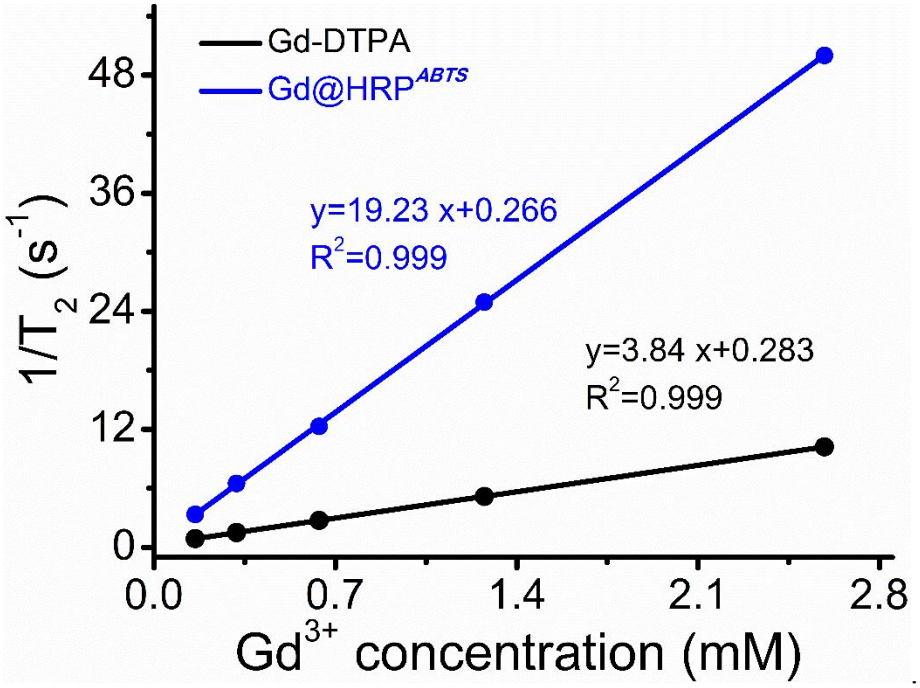

Figure S4. The transverse relaxation fitting curves of Gd@HRP^{ABTS} and the commercial contrast agent (Magnevist, Gd-DTPA).

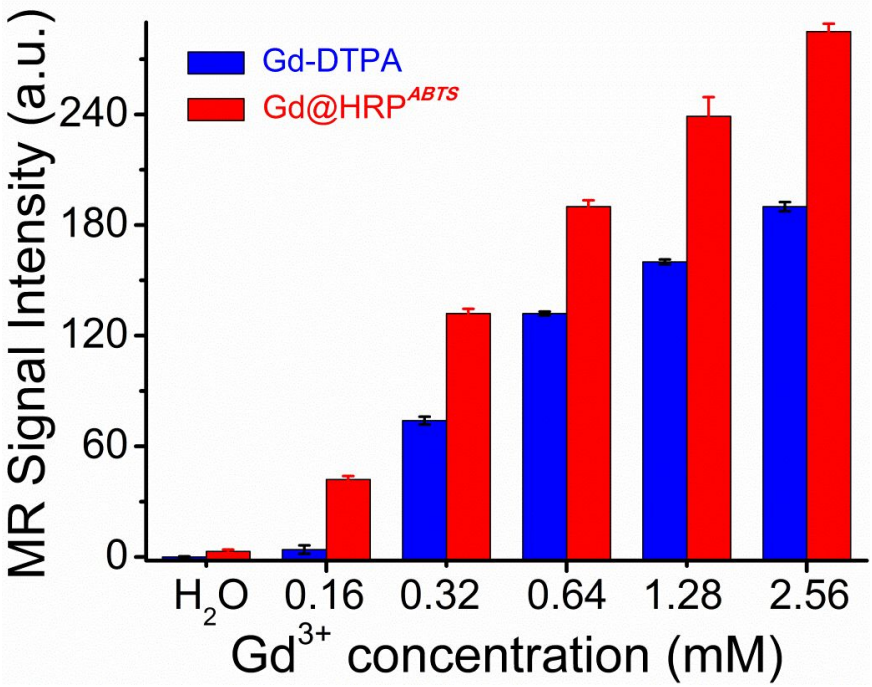

Figure S5. T_1-weighted MR signal intensities of the commercial Gd-DTPA and Gd@HRP^{ABTS} at the same Gd concentration.

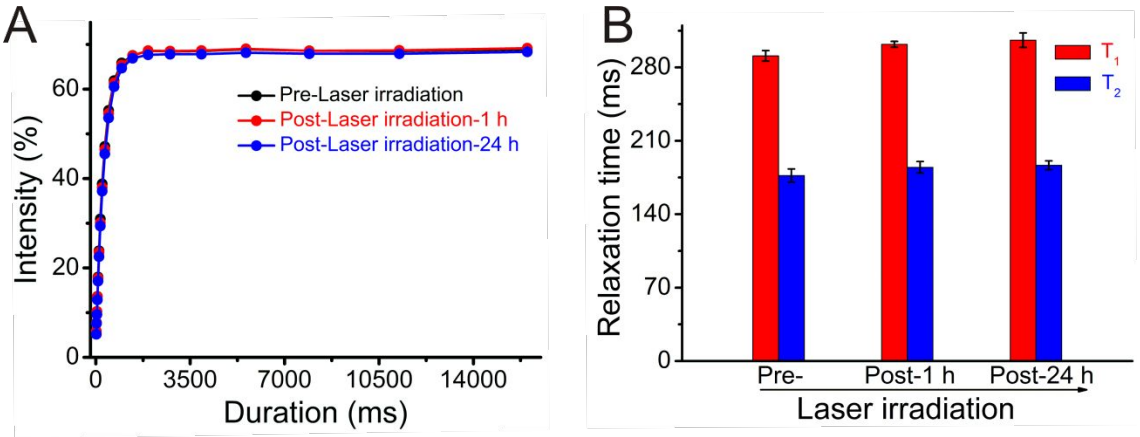

Figure S6. The (A) relaxation curve and (B) relaxation time of Gd@HRP^{ABTS} bafore and after laser irradiation for 1 h and 24 h.

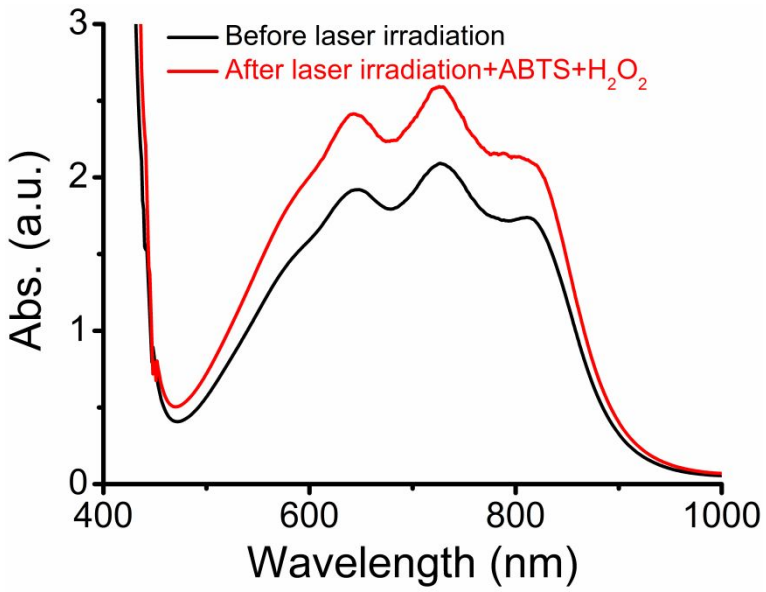

Figure S7 The absorption spectrum of Gd@HRP^{ABTS}+H_2O_2 before laser irradiation and re-addition of ABTS and H_2O_2 after laser irradiation

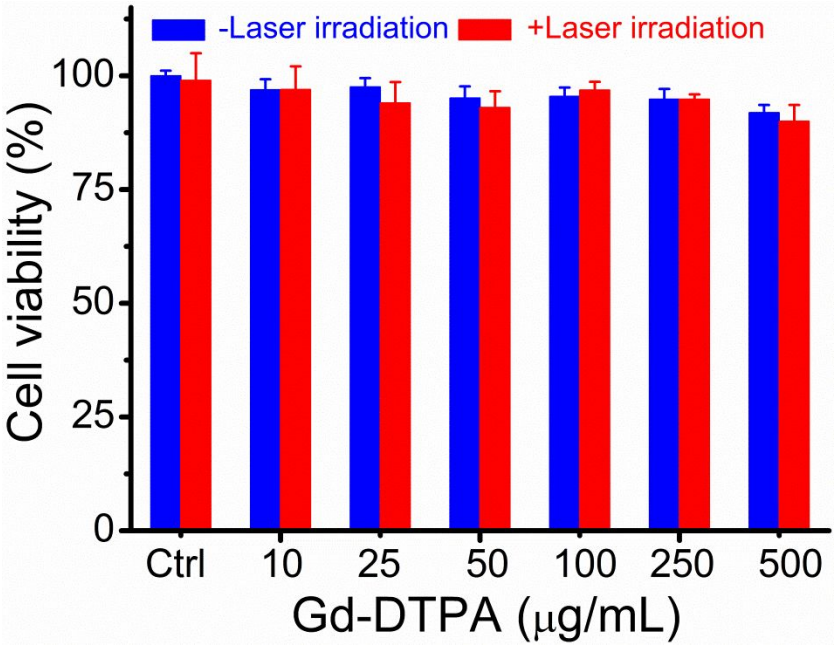

Figure S8. The cytoxicity of Gd-DTPA before and after laser irradiation.

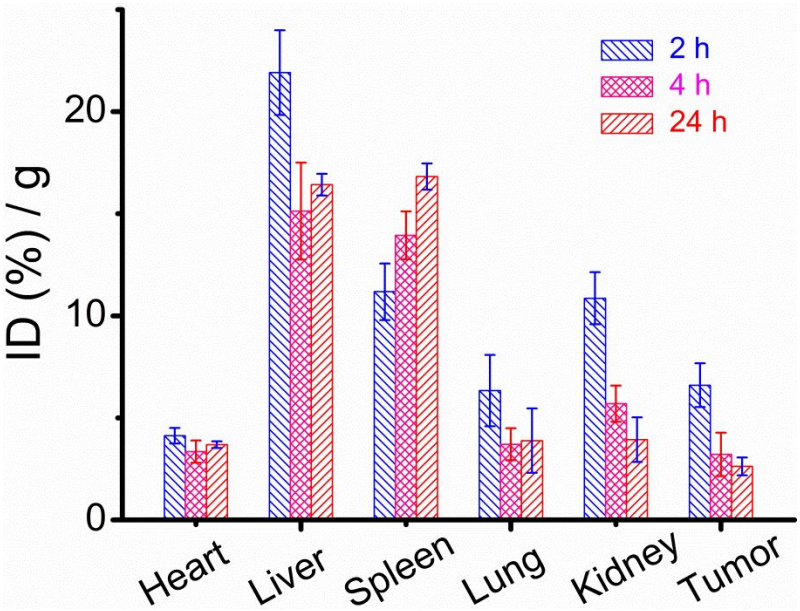

Figure S9 Biodistribution (heart, liver, spleen, lung, kidney, and tumor) of Gd@@HRP^{ABTS} nanodots in the 4T1 tumor-bearing mice at different post-injection time points (2 h, 4 h, and 24 h).