

Supplementary Information

Noninvasive Dynamic Imaging of Tumor Early Response to Nanoparticle-mediated Photothermal Therapy

Fan Zhang^{1§*}, *Jianbo Cao*^{1§}, *Xiao Chen*², *Kai Yang*³, *Lei Zhu*¹, *Guifeng Fu*¹, *Xinglu Huang*^{4*},
Xiaoyuan Chen^{4*}

¹State Key Laboratory of Molecular Vaccinology and Molecular Diagnostics & Center for Molecular Imaging and Translational Medicine, School of Public Health, Xiamen University, Xiamen, Fujian, 361005, China.

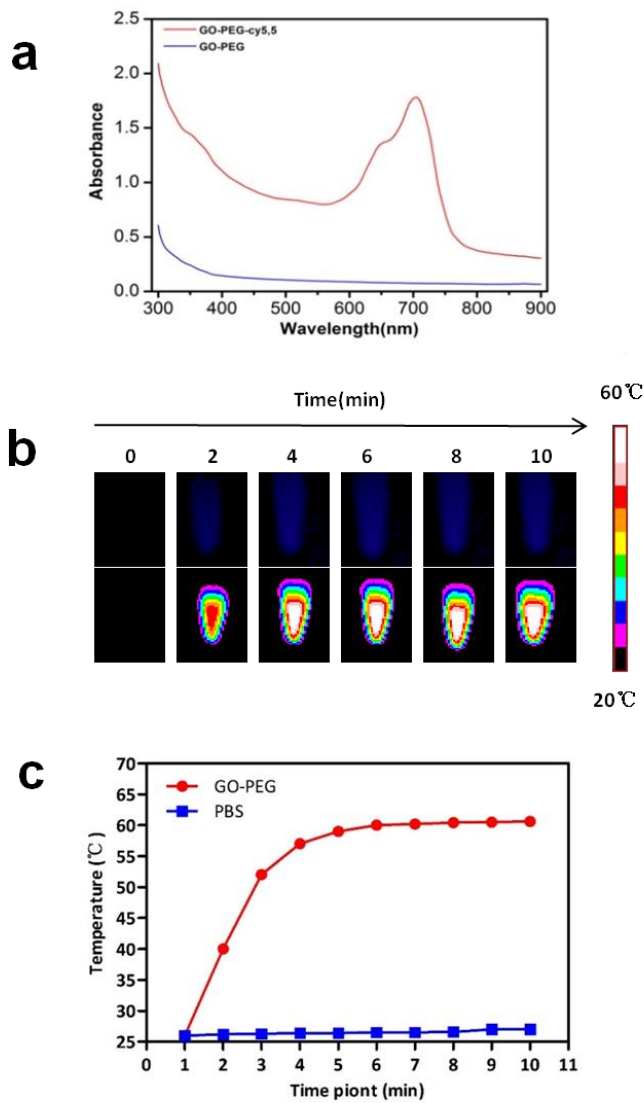
²Department of Pathology, Xinjiang Medical University, Urumqi, Xinjiang 830011, China.

³Jiangsu Key Laboratory for Carbon-Based Functional Materials and Devices, Institute of Functional Nano and SoftMaterials Laboratory (FUNSOM), Soochow University, Suzhou, Jiangsu, 215123, China.

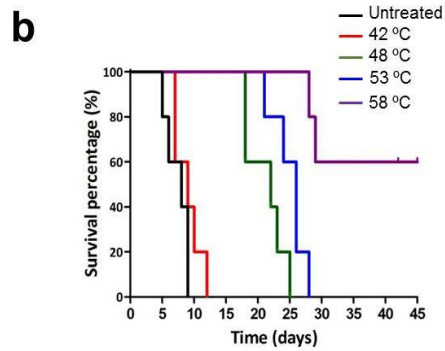
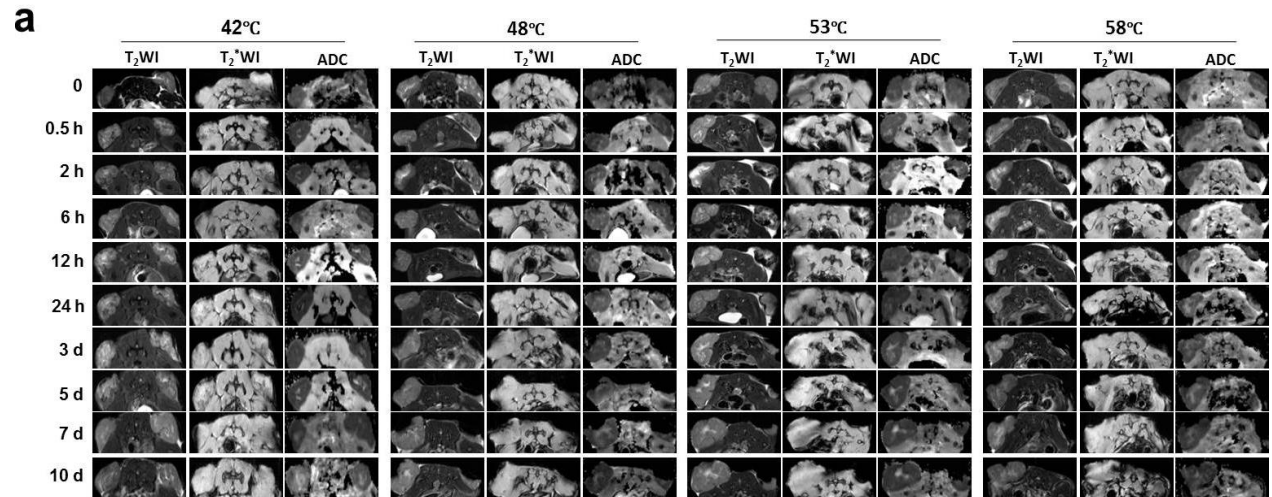
⁴Laboratory of Molecular Imaging and Nanomedicine (LOMIN), National Institute of Biomedical Imaging and Bioengineering (NIBIB), National Institutes of Health (NIH), Bethesda, Maryland 20892, United States.

§These authors contributed equally to this work.

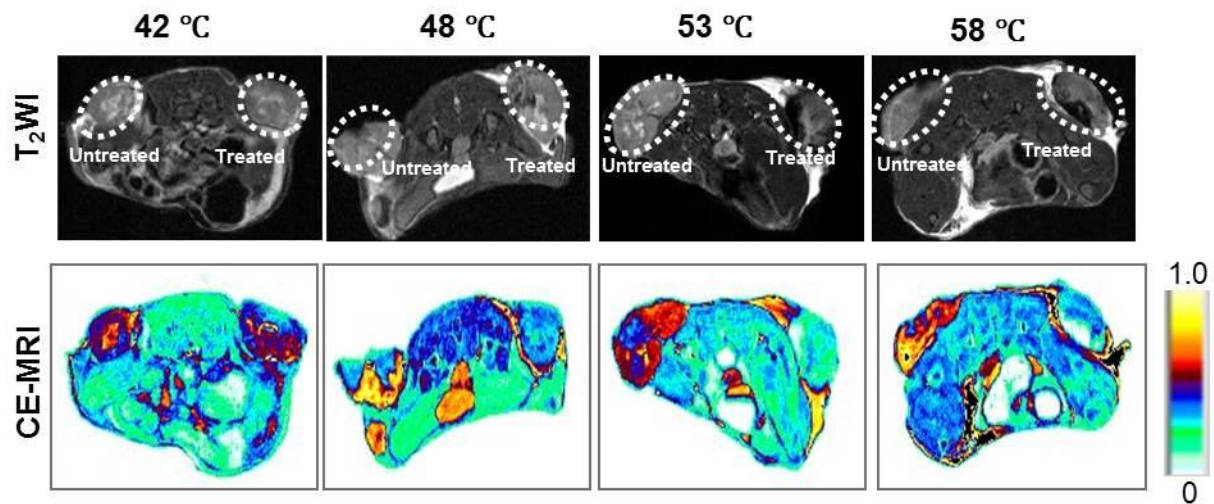
*Correspondence should be addressed to F. Z. (sailfmri@hotmail.com); X. H. (xhuang33@jhmi.edu); Xiaoyuan Chen (shawn.chen@nih.gov)



Supplementary Fig. 1. (a) UV-VIS-NIR spectra of GO-PEG and GO-PEG-Cy5.5. The photothermal effect of GO-PEG in PBS solution ($60\mu\text{g/ml}$) was examined in vitro by irradiating NIR light ($0.5\text{w/cm}^2, 10\text{min}$). (b) In vitro real-time thermal imaging map and (c) temperature change curve of GO-PEG.



Supplementary Fig. 2. *In vivo* MRI of 4T1 tumor-bearing mice before and after PTT. (a) Representative T_2 WI, T_2^* WI, and ADC map were shown before and 30 min after PTT at 42°C, 48°C, 53°C and 58°C ($n=5$ /group), respectively. Left tumor, untreated; right tumor, treated. Quantification analysis of tumor volume, T_2^* and ADC values were shown in Fig. 2.(b) Kaplan-Meier survival curves of untreated and treated mice with nanoparticle-mediated PTT at different temperatures ($n=5$ /group).



Supplementary Fig. 3. A T2-weighted (up) and CE T1-weighted (down) in vivo MR image acquired minutes after different temperatures thermal ablation. The dark regions observed in host-tumor interface at 48 °C, 53 °C and 58°C treated tumor on T2-weighted imaging. CE-MR images were immediately acquired by gadolinium contrast agent injection, which shows significantly blood perfusion changes in high temperature treated tumor (.Left tumor, untreated; right tumor, treated).