

# Surface-Functionalized NdVO<sub>4</sub>:Gd<sup>3+</sup> Nanoplates as Active Agents for Near-Infrared-Light-Triggered and Multimodal-Imaging-Guided Photothermal Therapy

Kerong Deng <sup>1,2,3,†</sup>, Donglian Liu <sup>1,†</sup>, Ziyang Wang <sup>4,†</sup>, Zhaoru Zhou <sup>2</sup>, Qianyi Chen <sup>2</sup>, Jiamin Luo <sup>2</sup>, Yaru Zhang <sup>1,2,\*</sup>, Zhiyao Hou <sup>1,2,\*</sup> and Jun Lin <sup>1,3,\*</sup>

<sup>1</sup> The Sixth Affiliated Hospital of Guangzhou Medical University, Qingyuan People's Hospital, Qingyuan 511518, China; dengkr26@gmail.com (K.D.); ldl00987@163.com (D.L.)

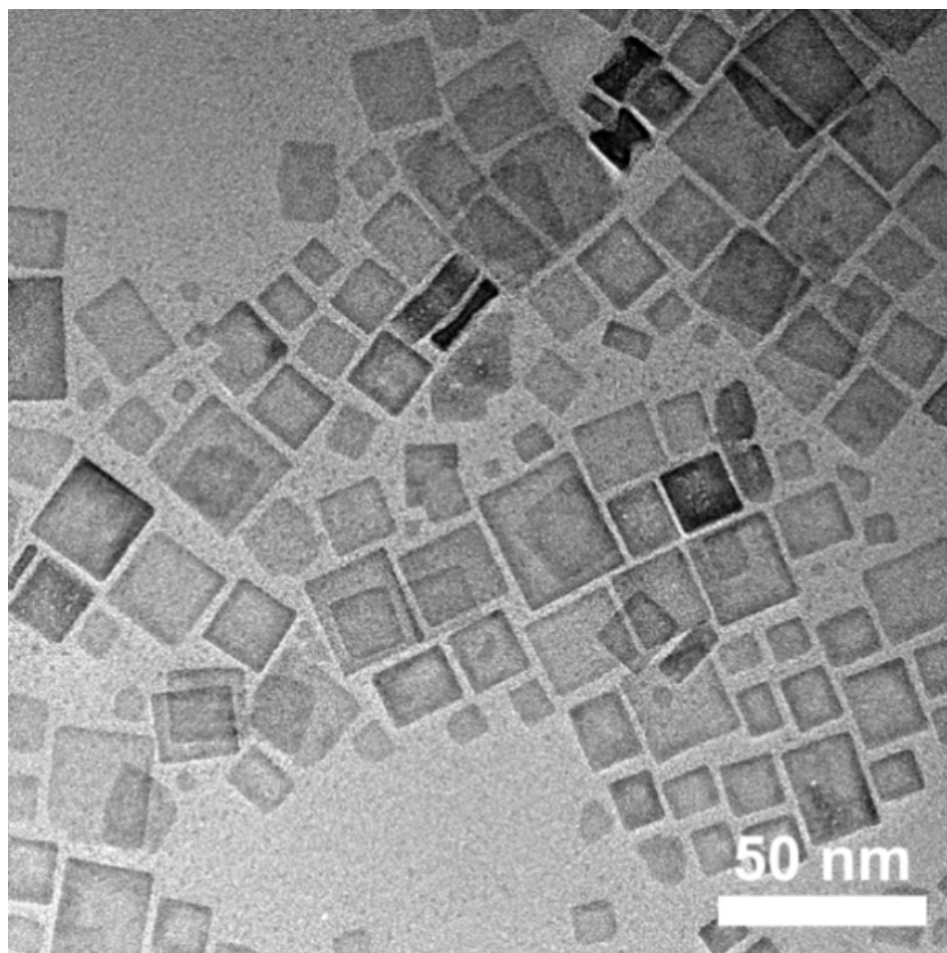
<sup>2</sup> Guangzhou Municipal and Guangdong Provincial Key Laboratory of Protein Modification and Degradation, School of Basic Medical Sciences, Guangzhou Medical University, Guangzhou 511436, China; 2019218158@stu.gzhmu.edu.cn (Z.Z.); 2019218157@stu.gzhmu.edu.cn (Q.C.); jiaminluo7@stu.gzhmu.edu.cn (J.L.)

<sup>3</sup> State Key Laboratory of Rare Earth Resource Utilization, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Changchun 130022, China

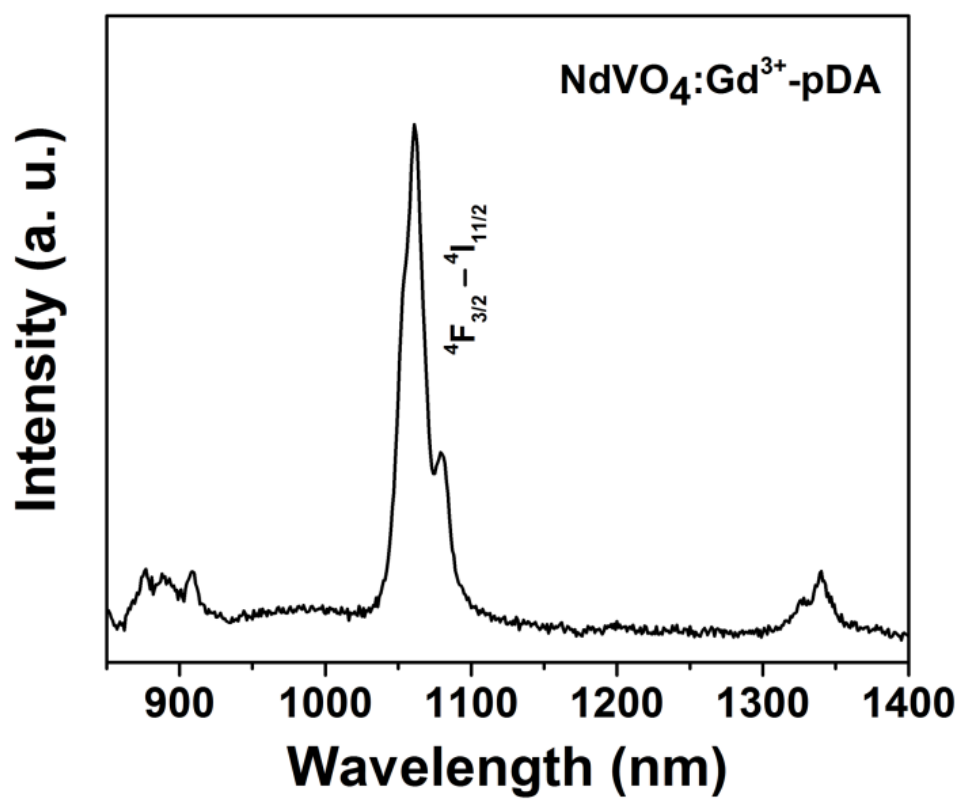
<sup>4</sup> The First Clinical School of Guangzhou Medical University, Guangzhou Medical University, Guangzhou 510120, China; wangzy2018@stu.gzhmu.edu.cn

\* Correspondence: zyr@gzhmu.edu.cn (Y.Z.); zyhou@gzhmu.edu.cn (Z.H.); jlin@ciac.ac.cn (J.L.)

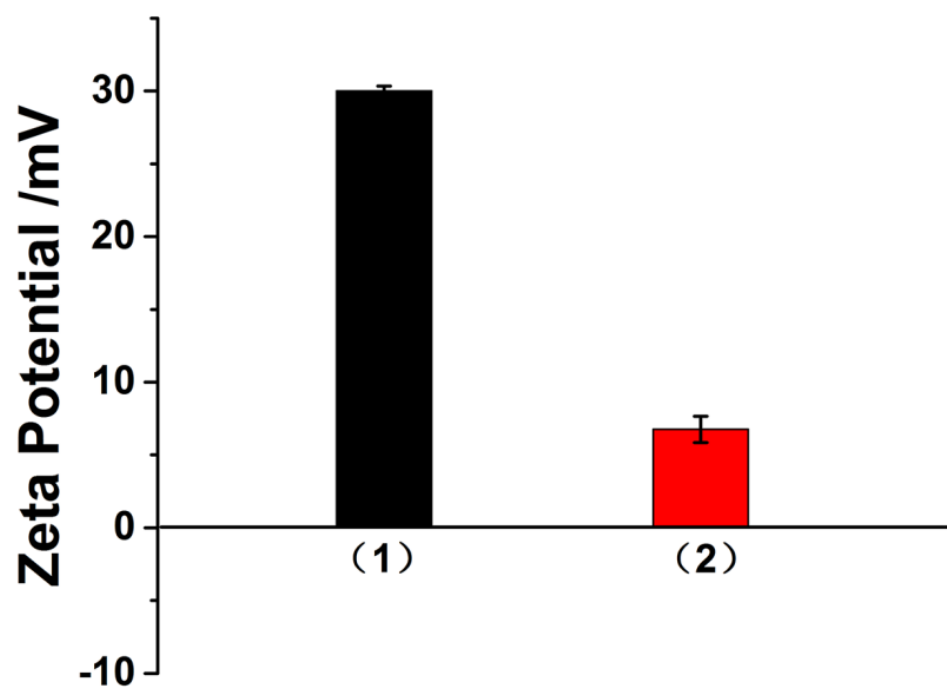
† These authors contributed equally to this work.



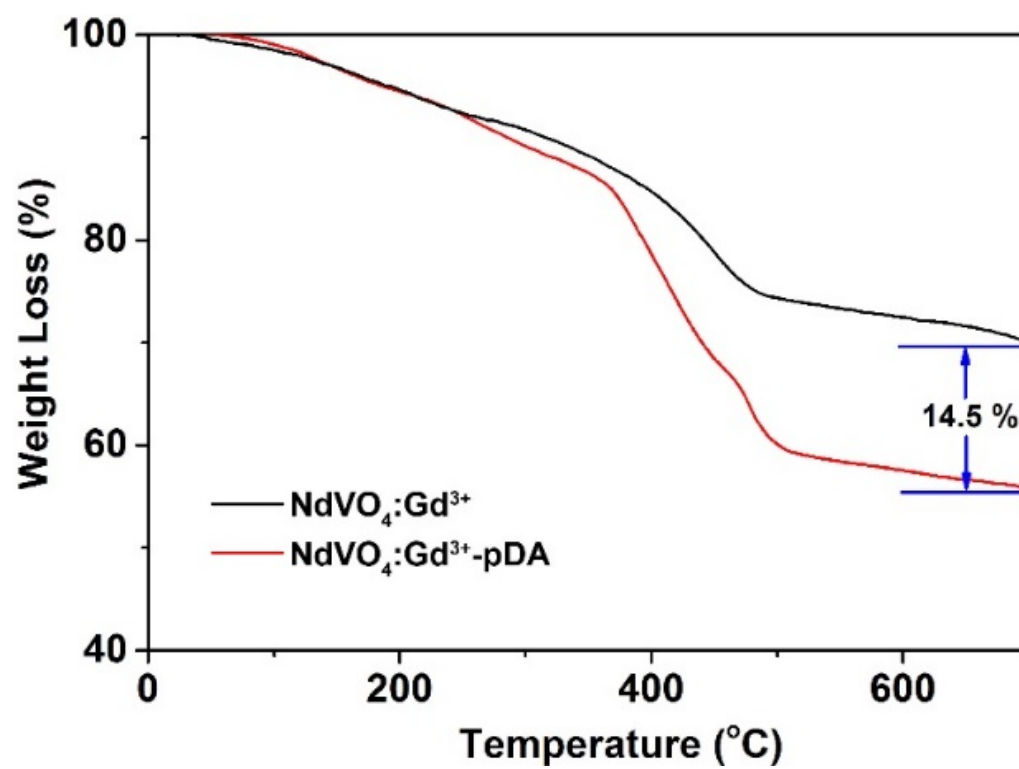
**Figure S1.** TEM image of as-obtained NdVO<sub>4</sub> nanoplates.



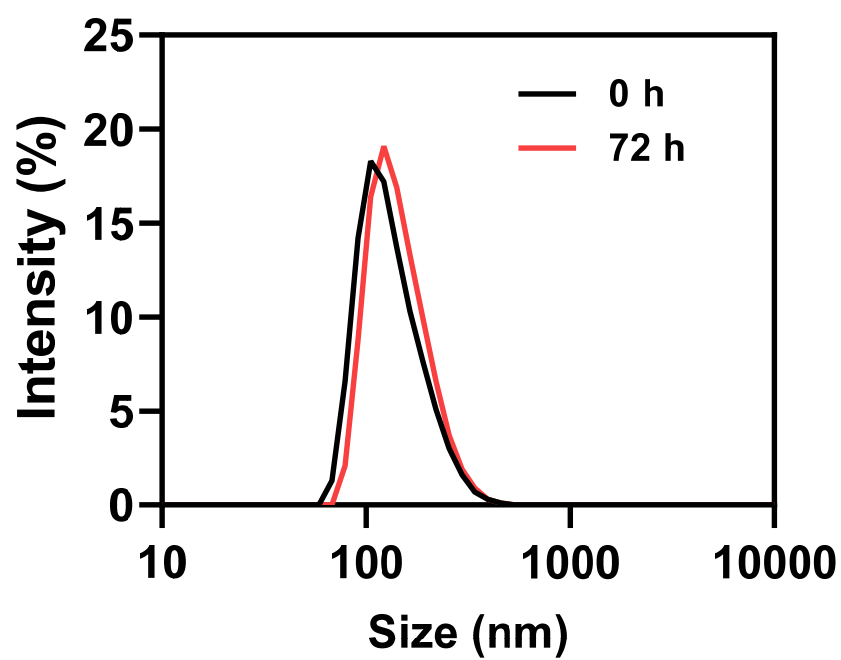
**Figure S2.** NIR-II emission spectrum of as-obtained  $\text{NdVO}_4:\text{Gd}^{3+}$ -pDA solution.



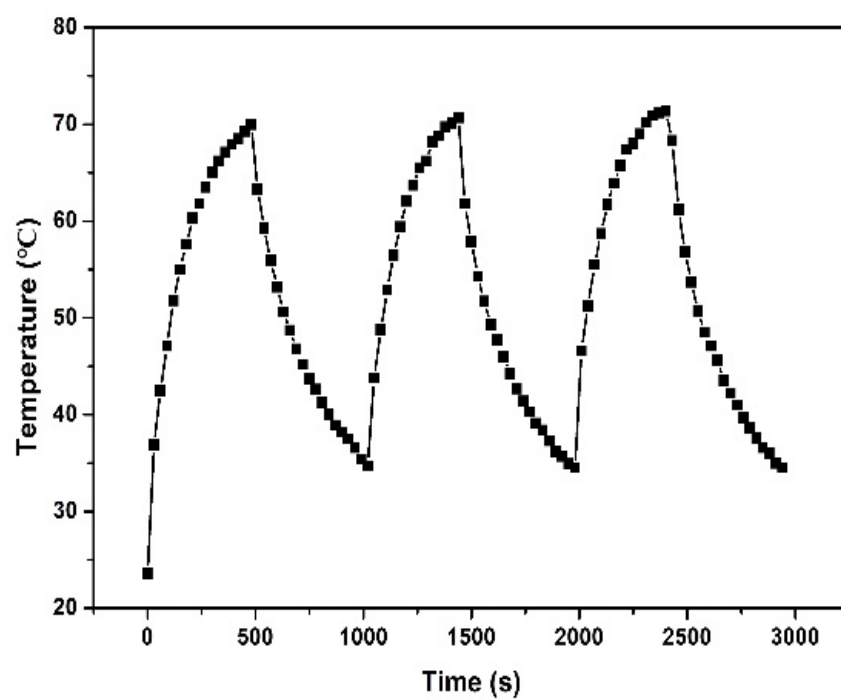
**Figure S3.** Surface charges of NdVO<sub>4</sub>:Gd<sup>3+</sup>-pDA (1) and NV-p@BSA (2) aqueous solution, respectively.



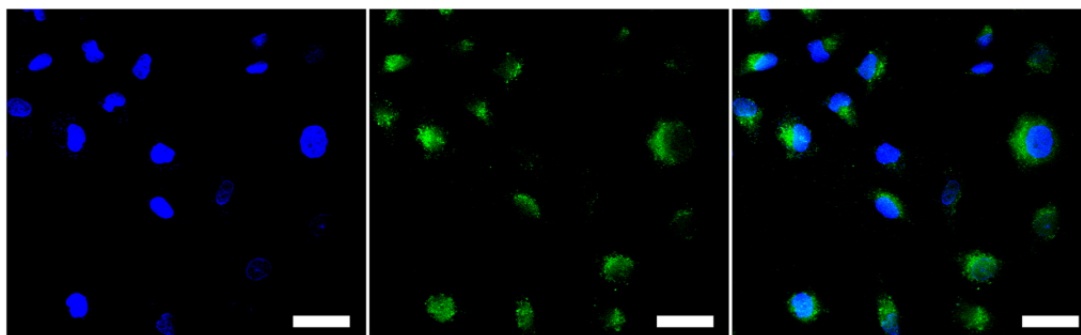
**Figure S4.** Typical thermal gravimetric analysis curve of  $\text{NdVO}_4:\text{Gd}^{3+}$  (black line)  $\text{NdVO}_4:\text{Gd}^{3+}\text{-pDA}$  (red line) nanoplates, respectively.



**Figure S5.** The particle size of NV-p@BSA NPs in PBS solution over 72 h.



**Figure S6.** Temperature increases by NV-p@BSA over three on/off cycles of 808-nm irradiation.



**Figure S7.** The confocal microscope images of HeLa cells after cultured with NV-p@BSA NPs for 24 h. Blue and green fluorescence in those images represent DAPI-stained cell nuclei and FITC-labeled NV-p@BSA NPs, respectively. All scale bars were 50  $\mu\text{m}$ .