

Supporting information for

A multifunctional nanoplatfom based on black phosphorus quantum dots for bioimaging and photodynamic/photothermal synergistic cancer therapy

Yi Li, Zhiming Liu*, Yuqing Hou, Guangcun Yang, Xixi Fei, Henan Zhao, Yanxian Guo, Chengkang Su, Zhen Wang, Huiqing Zhong, Zhengfei Zhuang and Zhouyi Guo*

MOE Key Laboratory of Laser Life Science & SATCM Third Grade Laboratory of Chinese Medicine and Photonics Technology, College of Biophotonics, South China Normal University, Guangzhou 510631, Guangdong, China.

Corresponding Author

*E-mail: liuzm021@126.com (Dr. Z.M. Liu); ann@scnu.edu.cn (Prof. Z.Y. Guo)

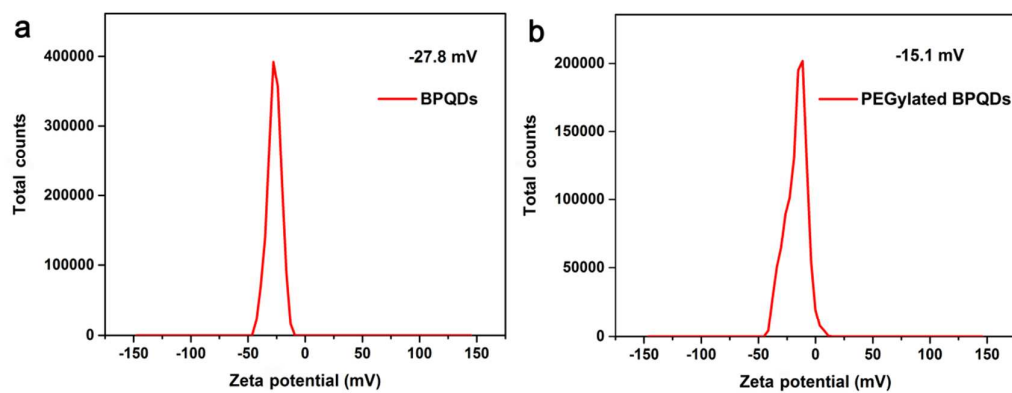


Figure S1. Zeta potentials of BPQDs (a) and PEGylated BPQDs (b).

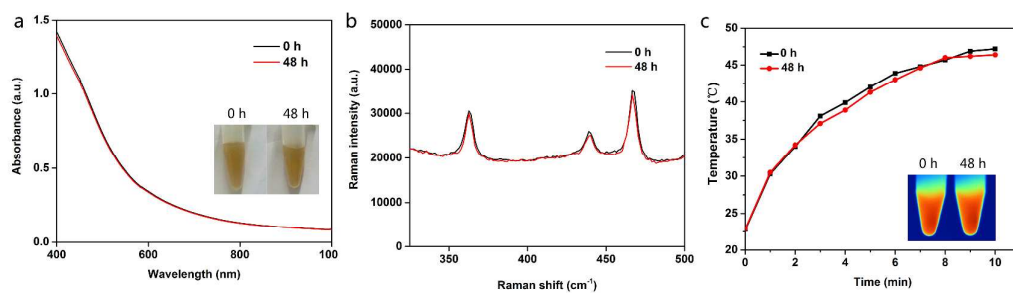


Figure S2. The UV-VIS absorbance spectrum (a) Raman spectrum (b) and temperature curves of PEG-BPQDs under 808 nm laser (c) at 0 h and 48 h.

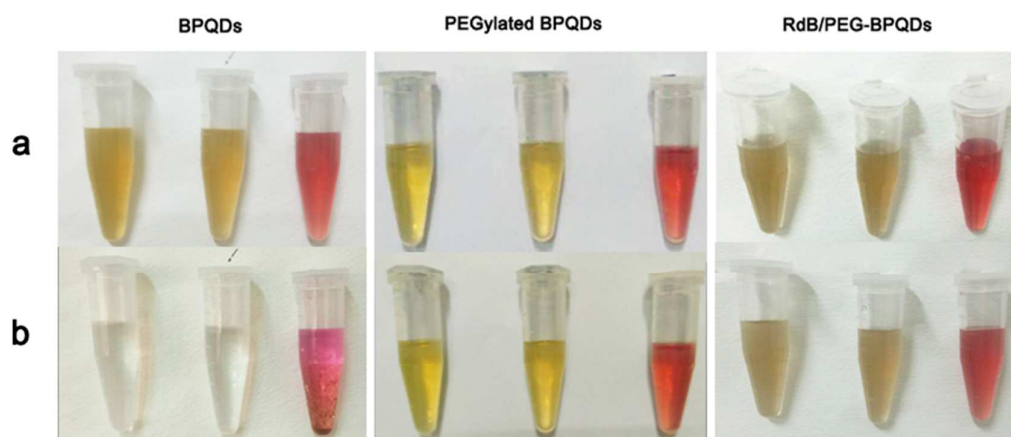


Figure S3. Photographs of BPQDs, PEGylated BPQDs and RdB/PEG-BPQDs dispersed in water, PBS and DMEM cell medium 10% fetal bovine serum (FBS) for 0 h (a) and 24 h (b).

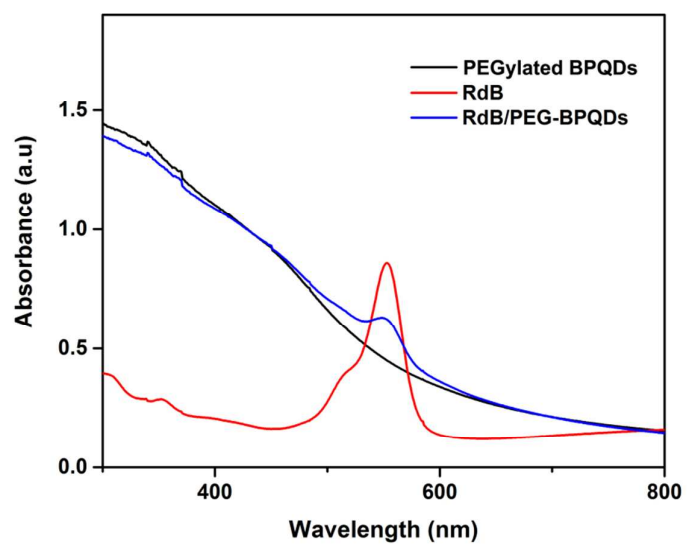


Figure S4. The UV-Vis-NIR absorbance spectra of PEGylated BPQDs, RdB and RdB/PEG-BPQDs.

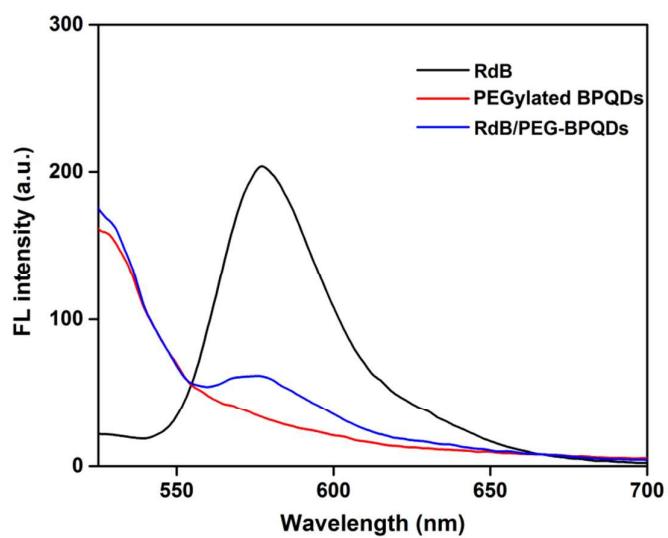


Figure S5. The fluorescence spectra of PEGylated BPQDs, RdB and RdB/PEG-BPQDs.

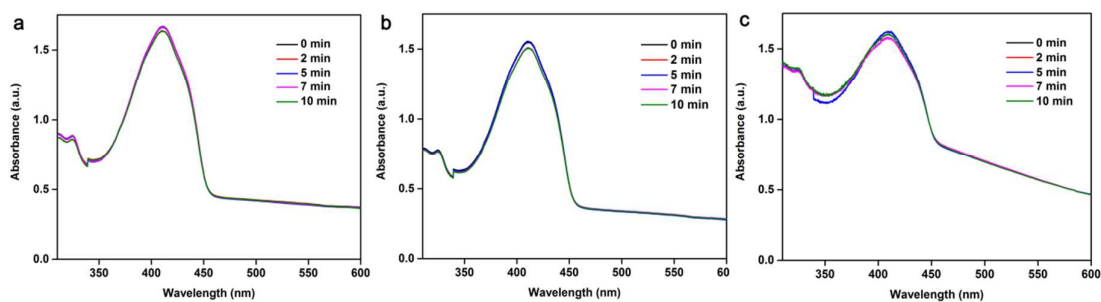


Figure S6. Time-course absorption spectra of DPBF solution when treated with BPQDs ($60 \mu\text{g/mL}$) (a) in dark, (b) added with NaN_3 and irradiated with 625 nm light, and (c) irradiated with 808 nm laser at a power density of 2 W/cm^2 .

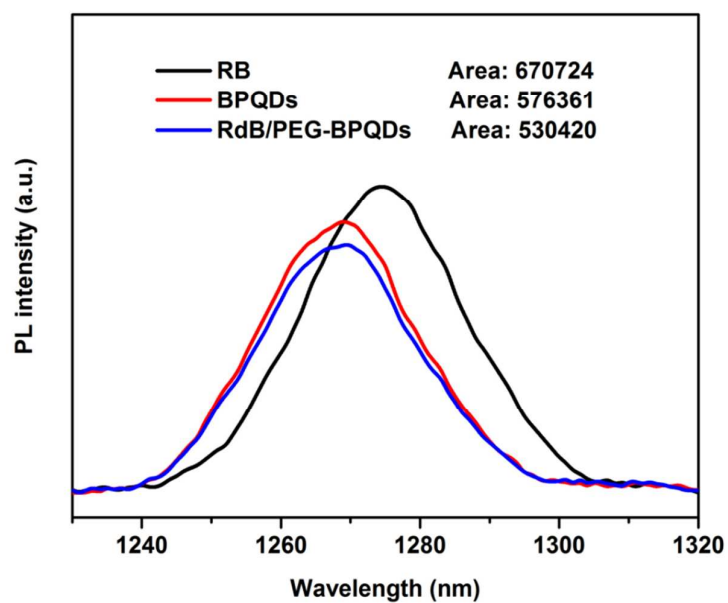


Figure S7. $^1\text{O}_2$ emission at ~ 1270 nm induced by RB, BPQDs, and RdB/PEG-BPQDs in ethanol under 530 nm laser excitation.

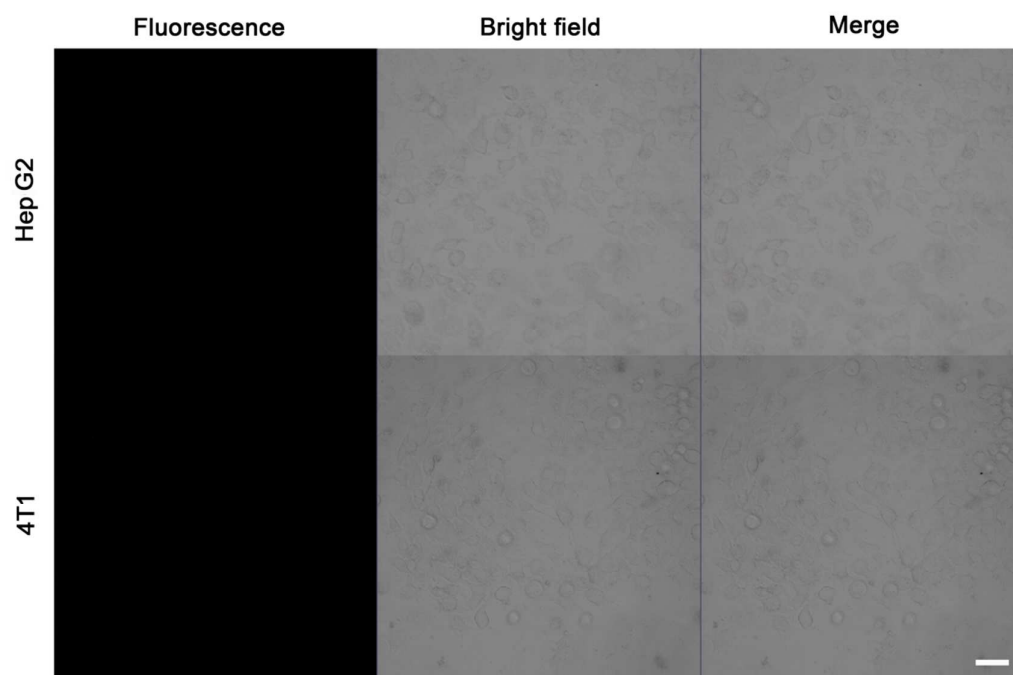


Figure S8. Confocal images of Hep G2 cells and 4T1 cells without RdB/PEG-BPQDs

(scale bar: 50 μm).

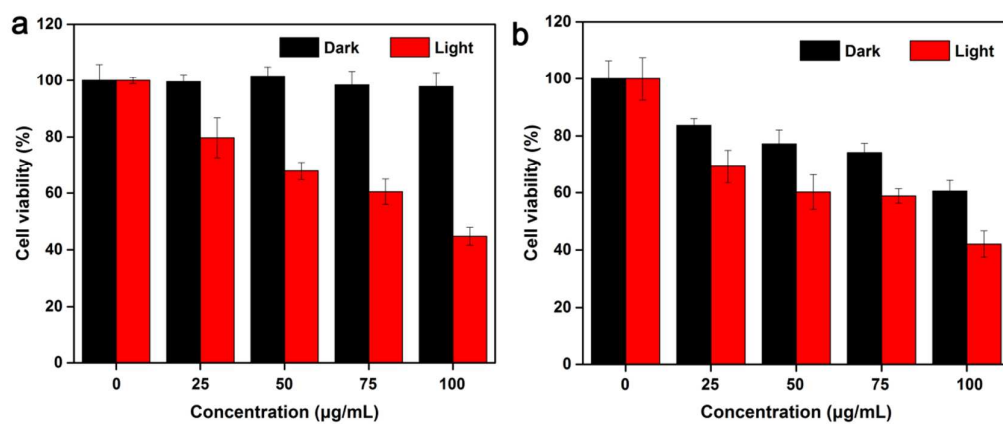


Figure S9. Dose-dependent PDT effects of the cell viability of Hep G2 cells: incubated

with (a) PEGylated BPQDs (0-100 μ g/mL) and (b) Ce6 (0-100 μ g/mL). Data are presented as mean \pm SD.

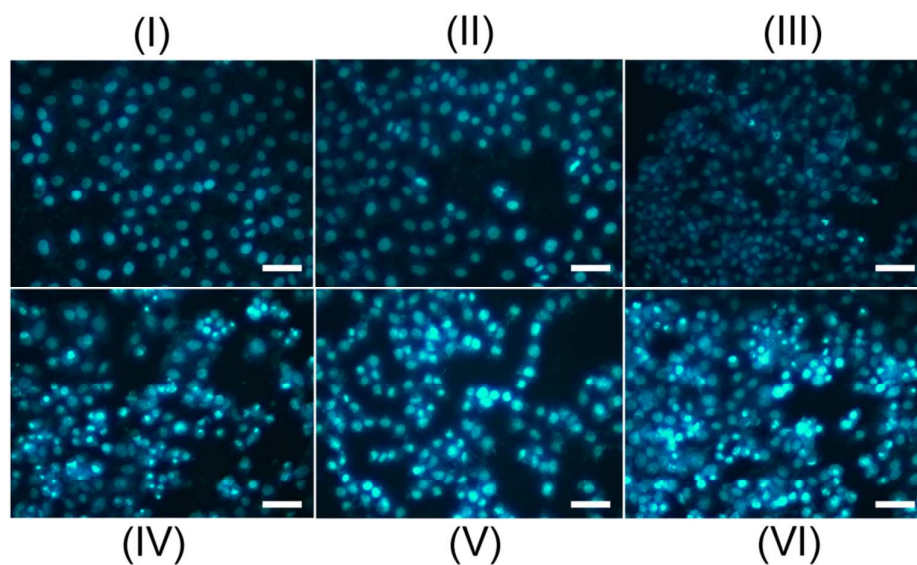


Figure S10. Fluorescence microscopic images of Hep G2 cells after various treatments (group I: control; group II: BPQDs; group III: 808 nm laser + 625 nm light; group IV: 625 nm light + BPQDs; group V: 808 nm laser + BPQDs; and group VI: 625 nm light + 808 nm laser + BPQDs) and after staining with Hoechst 33258 (scale bar: 100 μm).

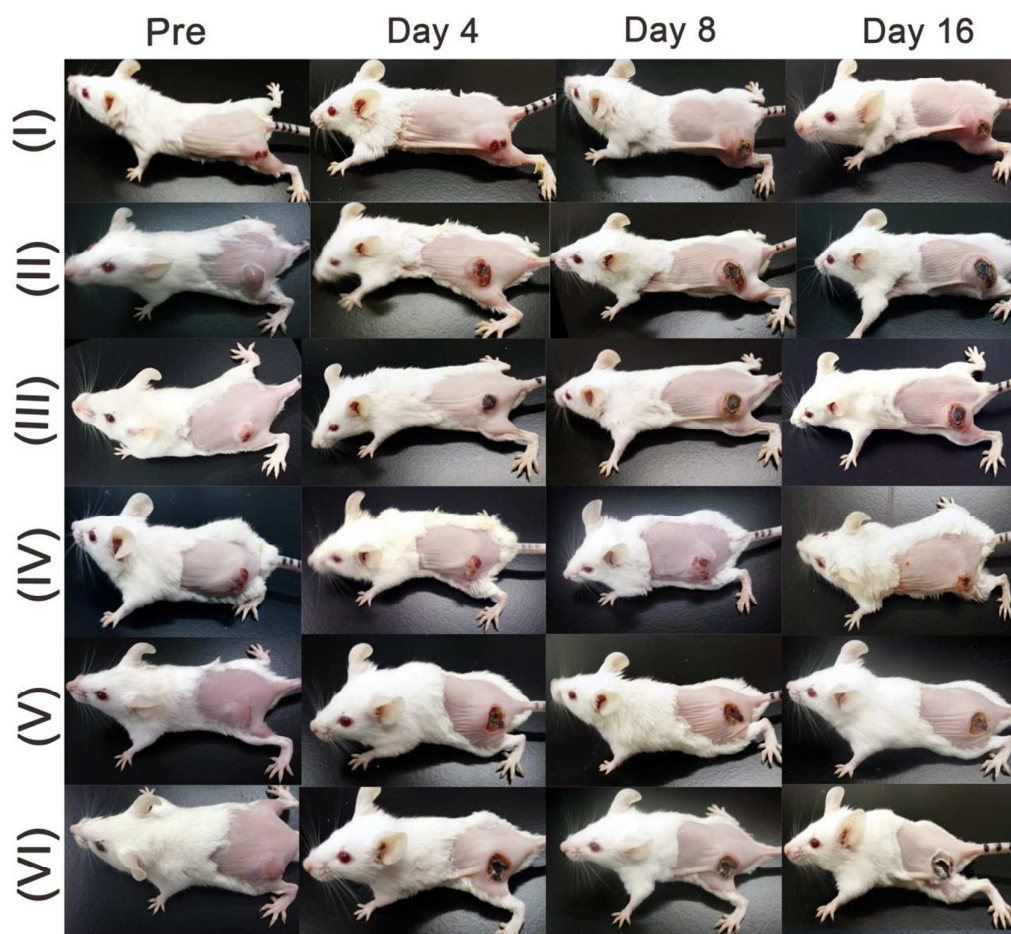


Figure S11. Representative photos of tumors in mice treated with PBS alone (group I), PBQDs alone (group II), laser irradiation alone (group III), BPQDs with 625 nm light irradiation (group IV) or 808 nm laser irradiation (group V), BPQDs with 625 nm light, and 808 nm laser irradiation (group VI) (625 nm light: 80 mW/cm², 20 min; 808 nm laser: 2 W/cm², 2 min).

