Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

Supporting Information

Black Phosphorus Based Synergistic Antibacterial Platform against Drug Resistant Bacteria

Jiang Ouyang, Ren-Yu Liu, Wansong Chen, Zhenjun Liu, Qunfang Xu, Ke Zeng, Liu Deng, Liangfang Shen, * and You-Nian Liu*

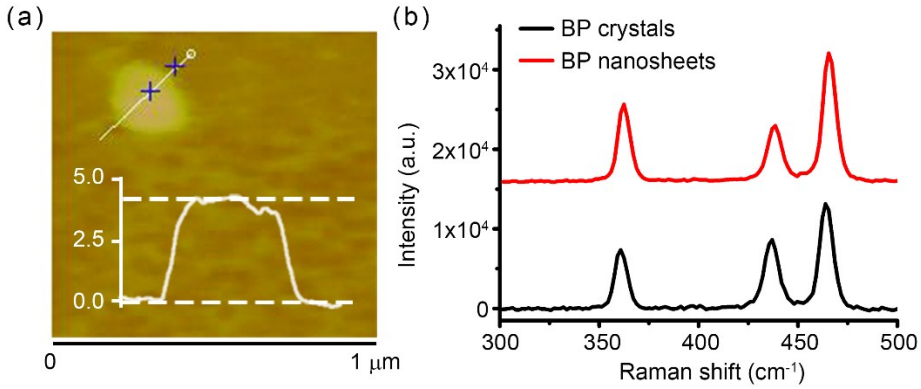

Figure S1. (a) AFM image of BP nanosheets and thickness analysis (white lines); (b) Raman spectra of BP nanosheets and BP crystals.

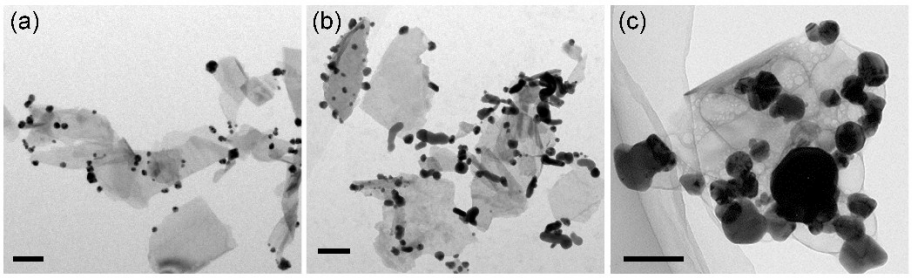

Figure S2. TEM images of Ag@BP nanohybrids (scale bars = 200 nm). $AgNO_3$ stock solution at different concentrations was used for preparation: (a) 5 mM; (b) 15 mM; (c) 30 mM.

Compared with the result in Figure 2b, lower concentration of $AgNO_3$ decreases the decorating density of Ag NPs (Figure S2a); whereas, higher concentration of $AgNO_3$ results in the accumulation of Ag NPs (Figure S2b and S2c). Therefore, $AgNO_3$ stock solution at 10 mM was used for the synthesis of Ag@BP nanohybrids.

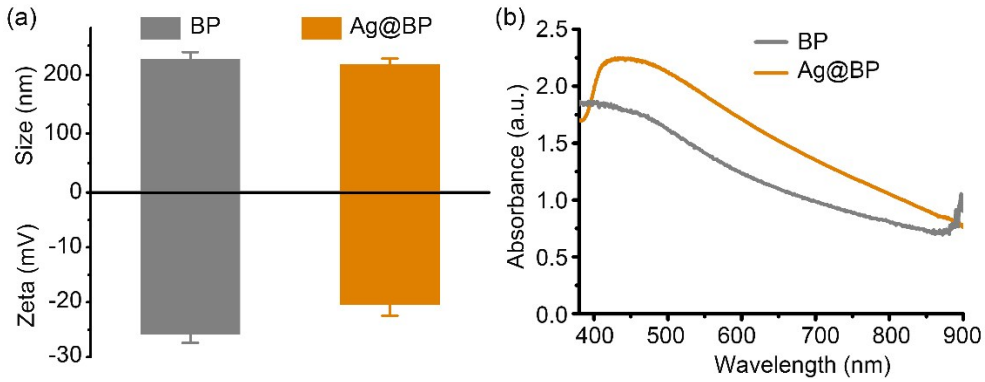

Figure S3. (a) Size and zeta potential of BP nanosheets and Ag@BP nanohybrids. (b) UV-Vis spectra of BP nanosheets and Ag@BP nanohybrids.

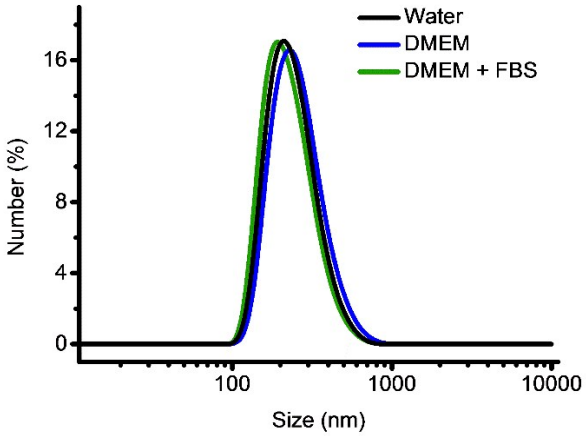

Figure S4. Size distributions of Ag@BP nanohybrids in water, DMEM cell culture medium with and without 10% fetal bovine serum (FBS).

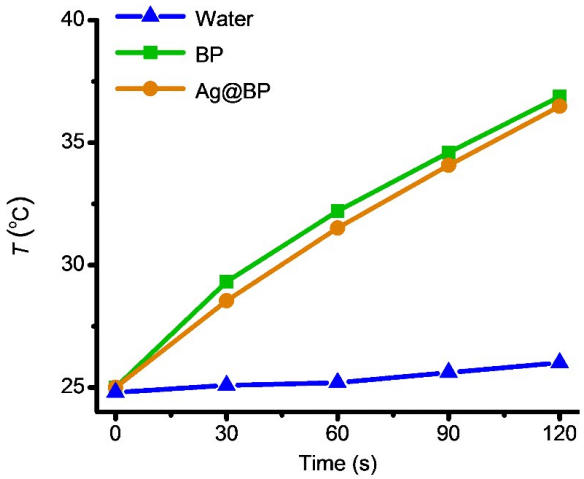

Figure S5. Photothermal effect of BP nanosheets and Ag@BP nanohybrids under 808 nm light irradiation (0.8 W cm^{-2}).

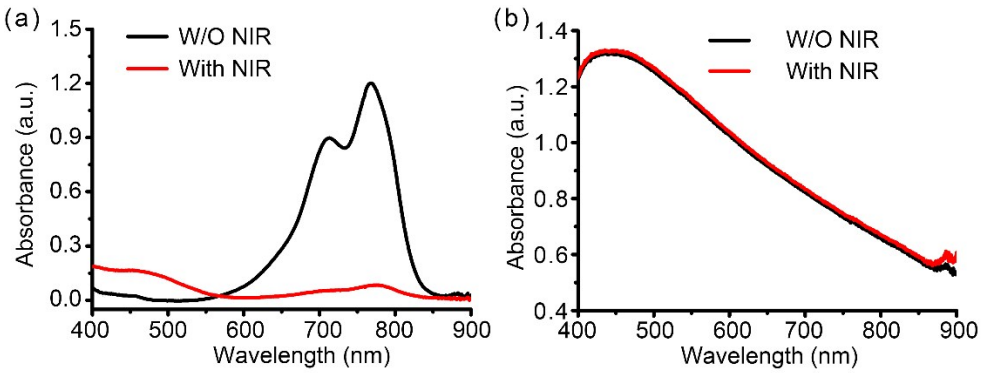

Figure S6. UV-Vis spectra of (a) ICG and (b) Ag@BP nanohybrids before and after 808 nm light irradiation.

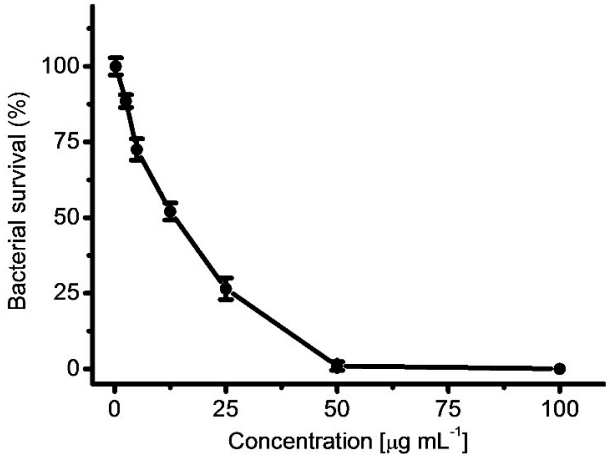

Figure S7. Concentration dependent antibacterial activity of Ag@BP nanohybrids against MRSA bacteria under 808 nm light irradiation (0.8 W cm^{-2}, 5 min).

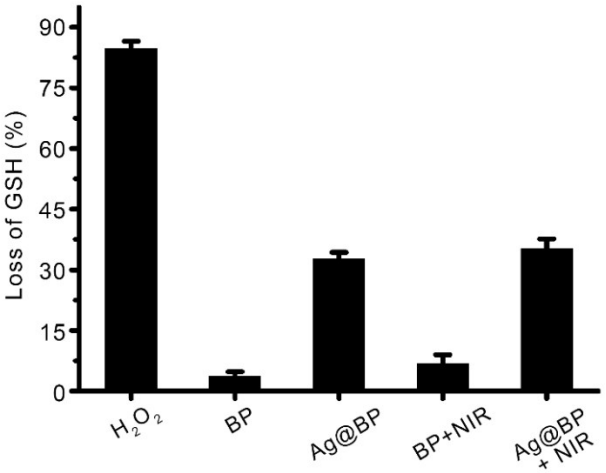

Figure S8. GSH depletion after different treatments.

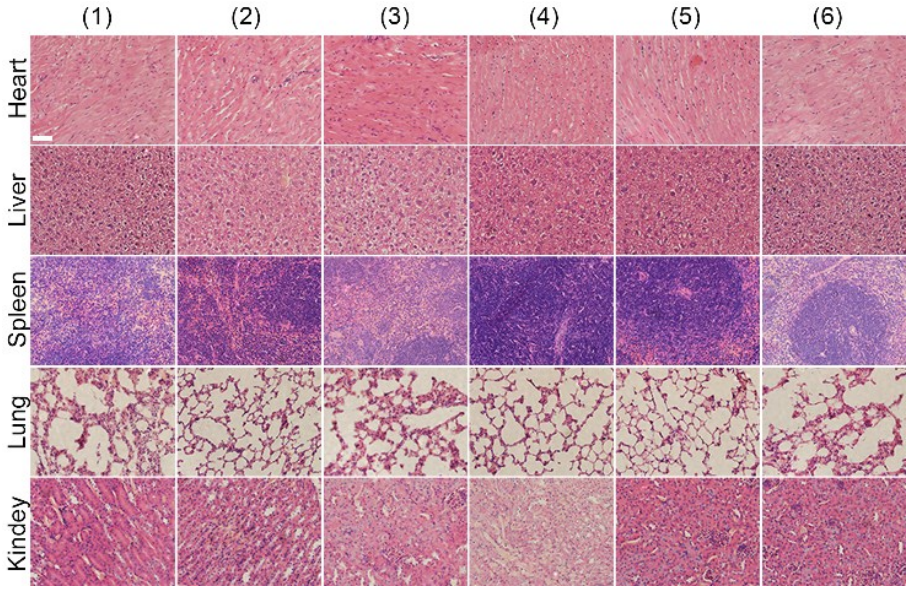

Figure S9. H&E staining of main organs (heart, liver, spleen, lung, kindey) after different treatments: (1) blank control; (2) NIR; (3) BP; (4) Ag@BP; (5) BP + NIR; and (6) Ag@BP + NIR (scale bar = 50 μm).