Supporting Information

Bioactive phospho-therapy with black phosphorus for *in vivo* tumor suppression

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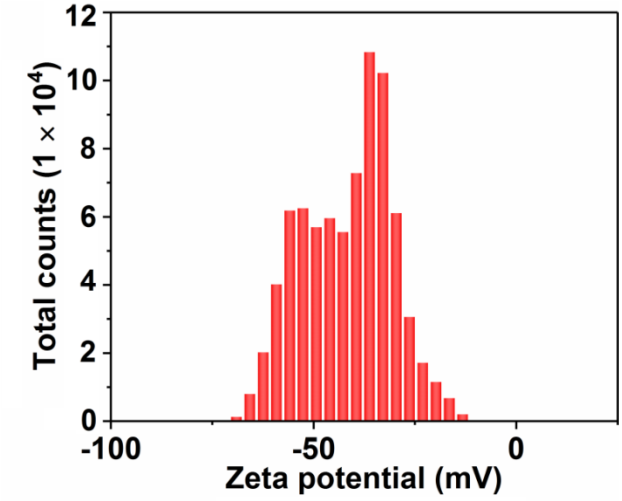

Figure S1. Zeta potentials of BPs.

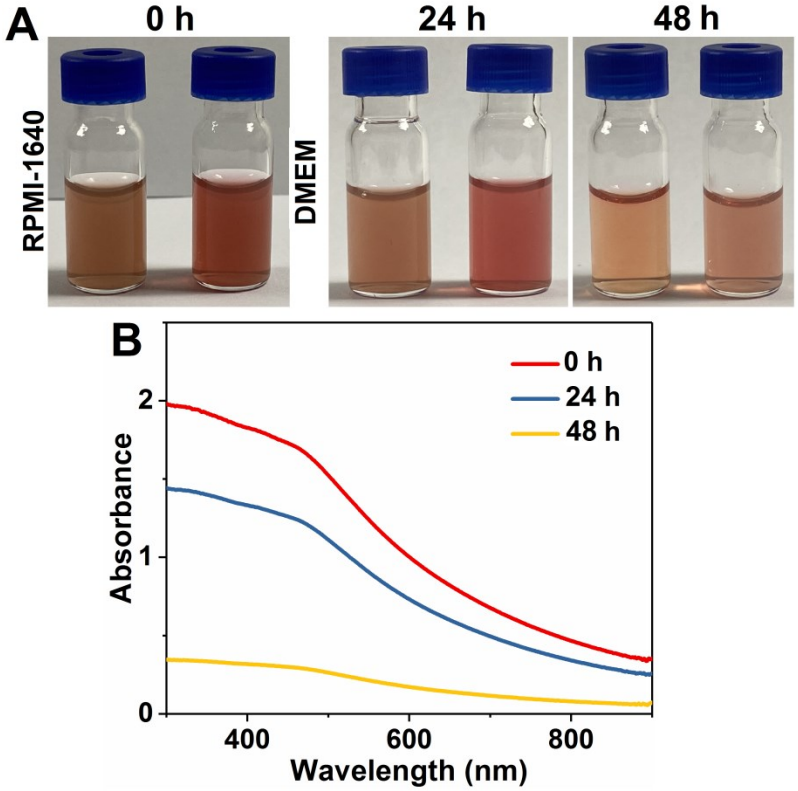

Figure S2. Stability evaluation of BPs: (A) Photographs and (B) Absorption spectra of the cell culture medium (RPMI-1640 and DMEM) containing 10% serum and 20 μg/mL of BPs.

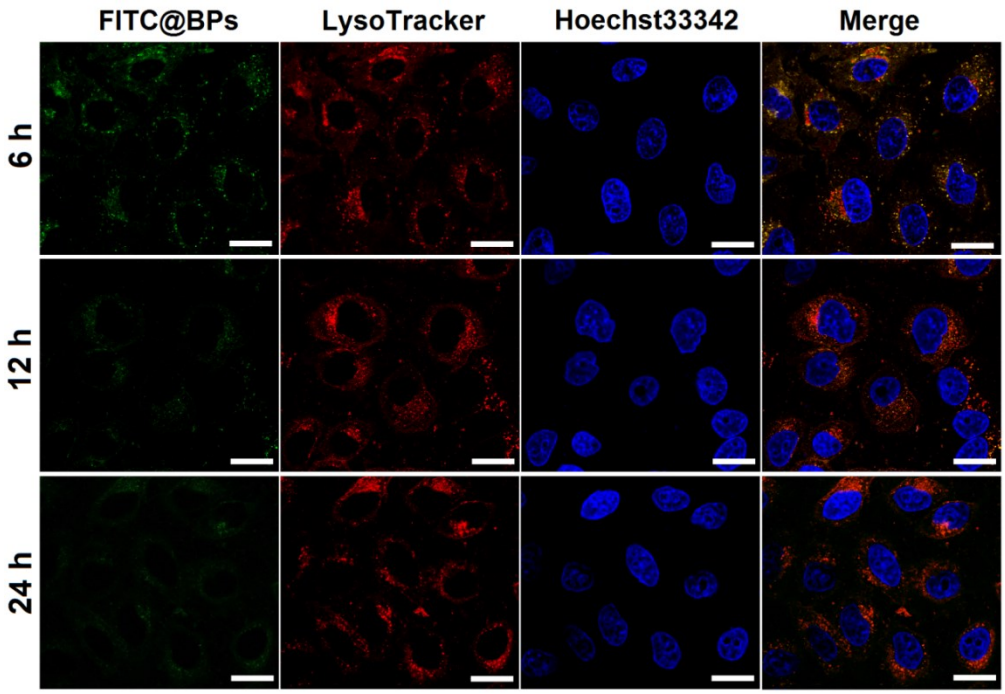

Figure S3. Confocal fluorescence images of QSG-7701 cells treated with BPs (4 μg/mL) for different time intervals. The green and red fluorescence images show FITC and LysoTracker Red DND-99, respectively. The scale bar is 20 μm.

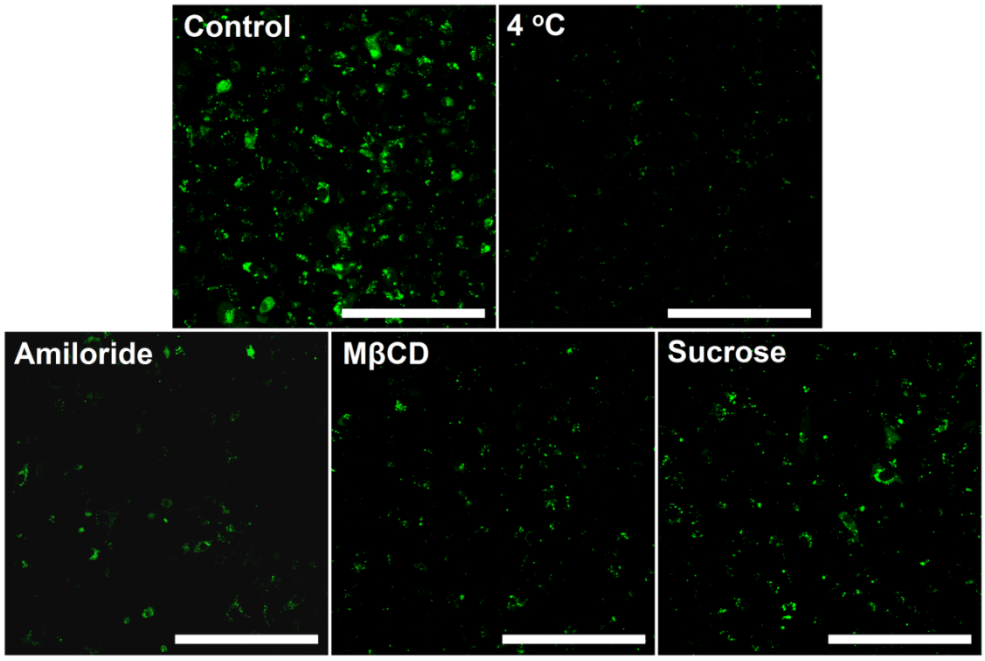

Figure S4. Confocal fluorescence images of HepG2 cells after treatment at low temperature (4 ^{o}C) with different endocytosis inhibitors. The scale bar is 100 μm.

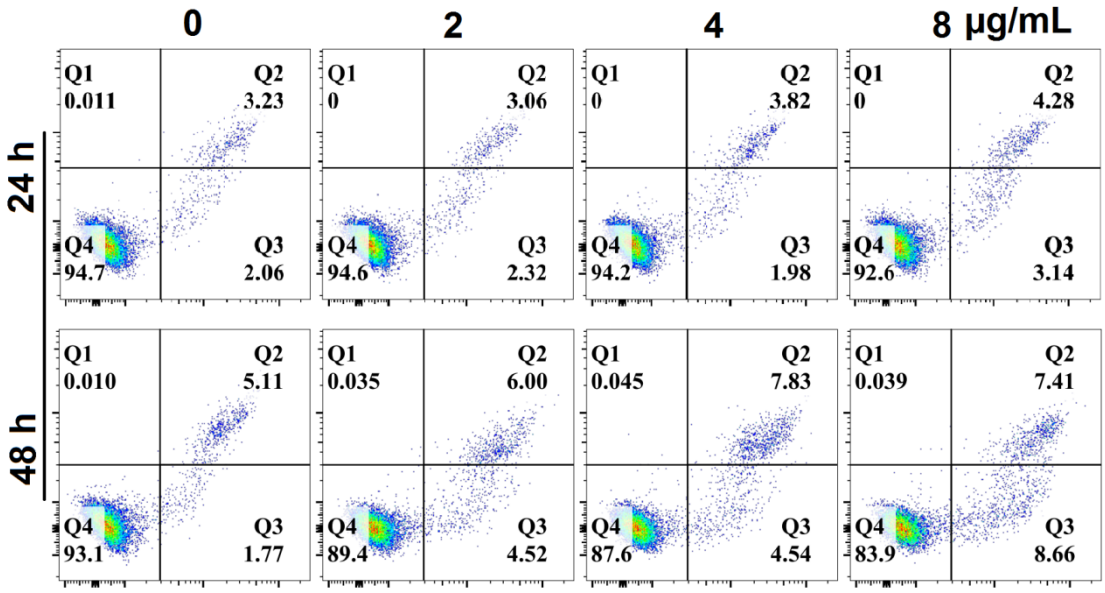

Figure S5. Apoptosis assay of QSG-7701 cells by Annexin V/PI staining after treatment with different concentrations of BPs for 24 or 48 h.

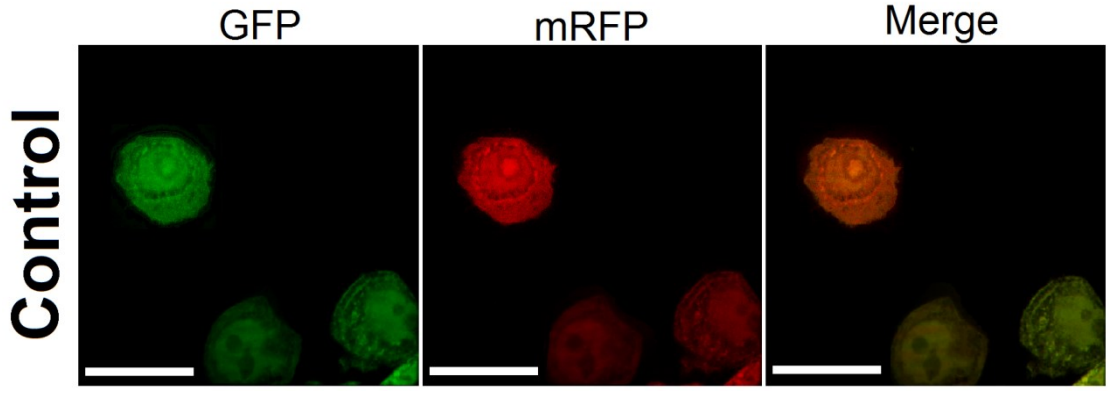

Figure S6. Confocal fluorescent images of mRFP-GFP-LC3-transfected HepG2 cells without treatment with BPs for 48 h (Scale bar = 20 μm).

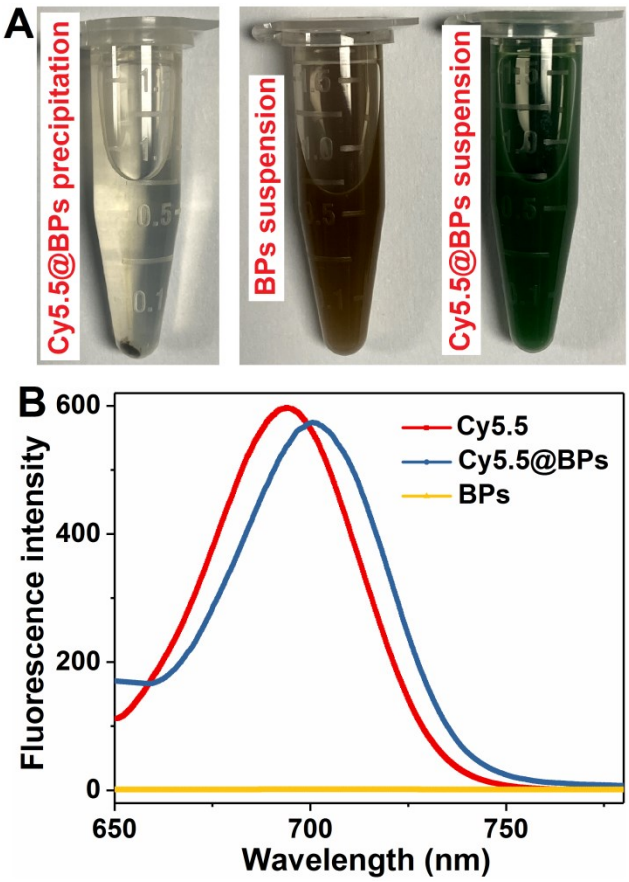

Figure S7. Characterization of Cy5.5-labeled BPs: (A) Photographs of the BPs and Cy5.5-labeled BPs; (B) Fluorescence spectra of Cy5.5 and Cy5.5-labeled BPs (Excitation wavelength = 675 nm). No fluorescence can be observed from the BPs without Cy5.5 labeling.

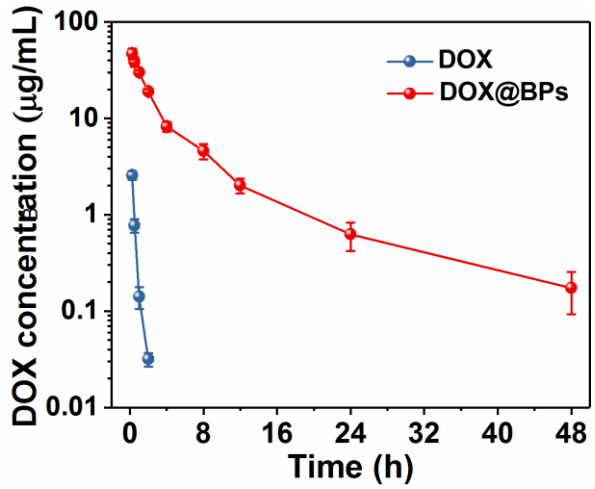

Figure S8. Plasma concentration of DOX after a single intravenous injection of free DOX and DOX-labeled BPs (5 mg/kg, n = 3).

Table S1. Pharmacokinetic parameters of free DOX and DOX-labeled BPs (n = 3).

Parameters	$AUC_{0\text{-}t}$ (h·μg/mL)	C_{max} (μg/mL)	*Lz* (1/h)	$MRT_{0\text{-}t}$ (h)	*CL* (mL/h)
Free DOX	0.64 ± 0.1	2.57 ± 0.54	1.82 ± 0.23	0.60 ± 0.08	1856.6 ± 89.5
DOX@BPs	204.6 ± 15.4	47.11 ± 5.63	0.18 ± 0.04	4.36 ± 0.49	5.34 ± 0.97

$AUC_{0\text{-}t}$, total area under the blood concentration versus time curve; C_{max}, maximum plasma concentration; *Lz*, elimination rate constant; $MRT_{0\text{-}t}$, mean residence time; *CL*, total body clearance.

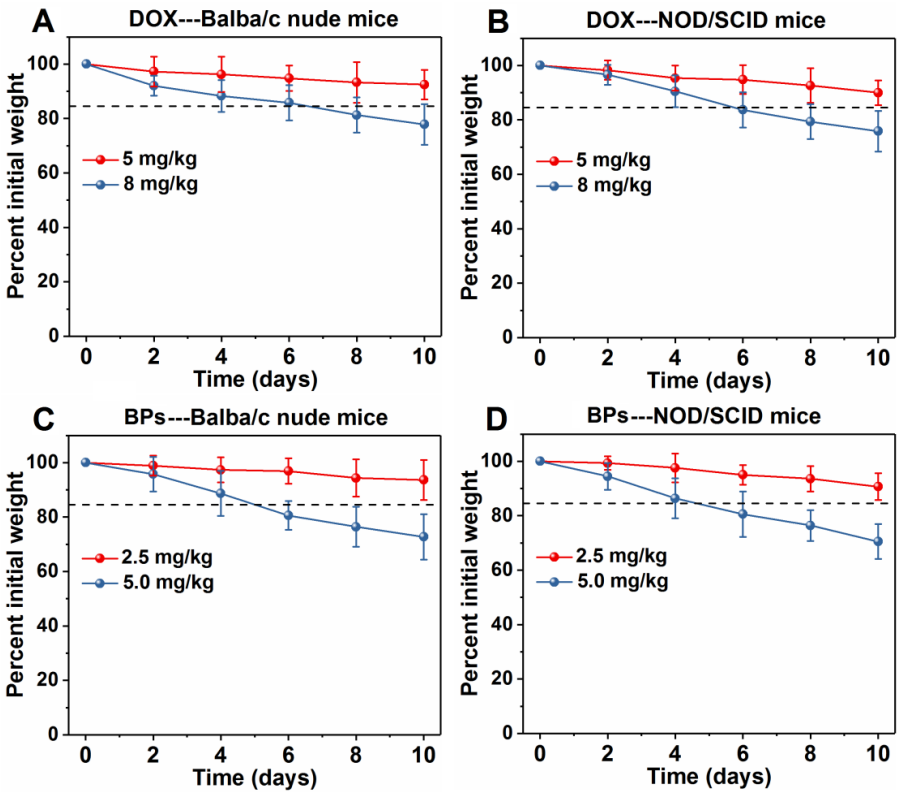

Figure S9. Average mouse weights versus time. The data are presented as the percentage of the initial weights for Balb/c nude mice and NOD/SCID mice treated with DOX (A, B) or BPs (C, D) and $n = 3$ for each treatment group.

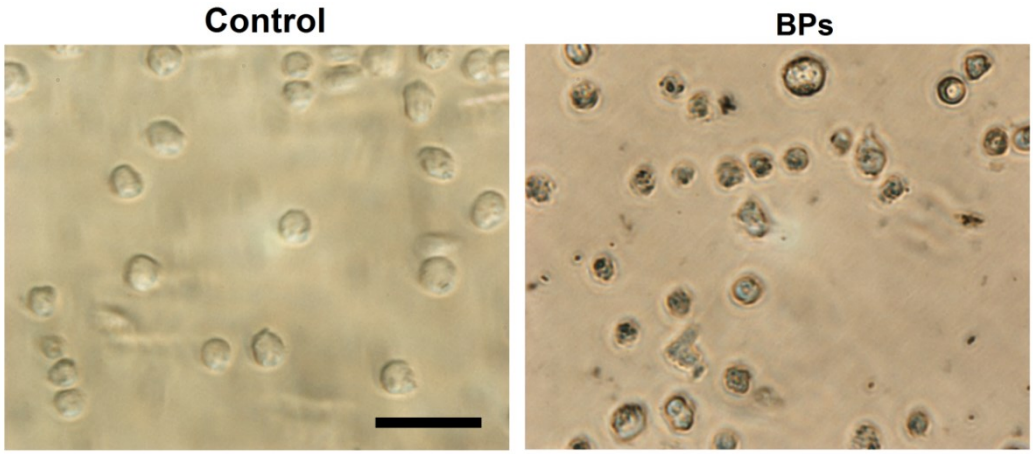

Figure S10. Optical microscopy images of HL-60 cells without/with incubation with BPs (32 μg/mL) for 24 h (Scale bar = 50 μm).