Supplementary Information

Quaternary ammonium-based nanosystem enables delivery of CRISPR/Cas9 for cancer therapy

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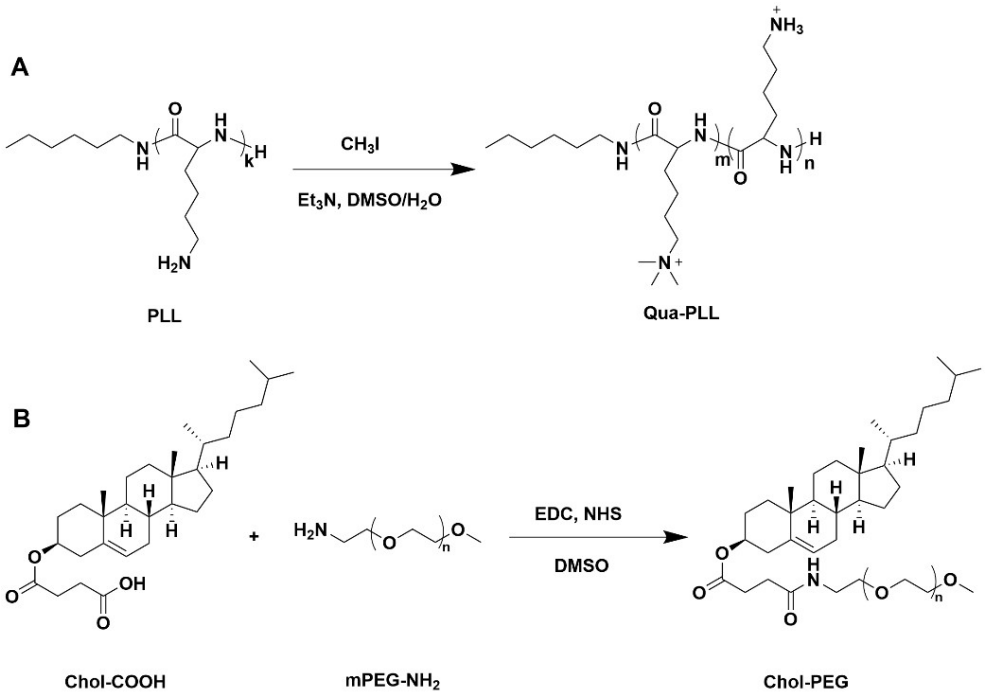

Figure S1. The synthetic routes of (A) Qua-PLL and (B) Chol-PEG.

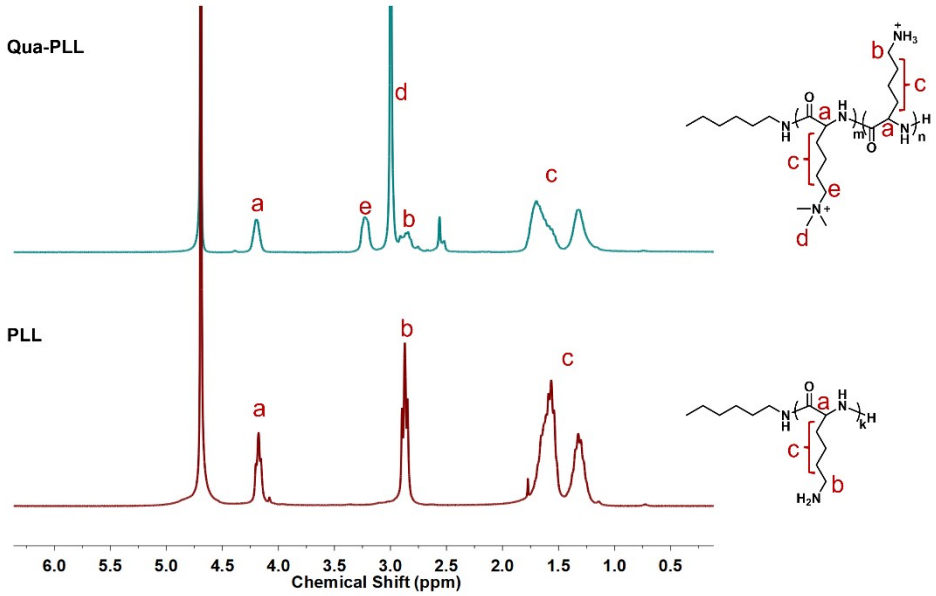

Figure S2. The ^{1}H NMR spectrum of Qua-PLL and PLL in D_2O.

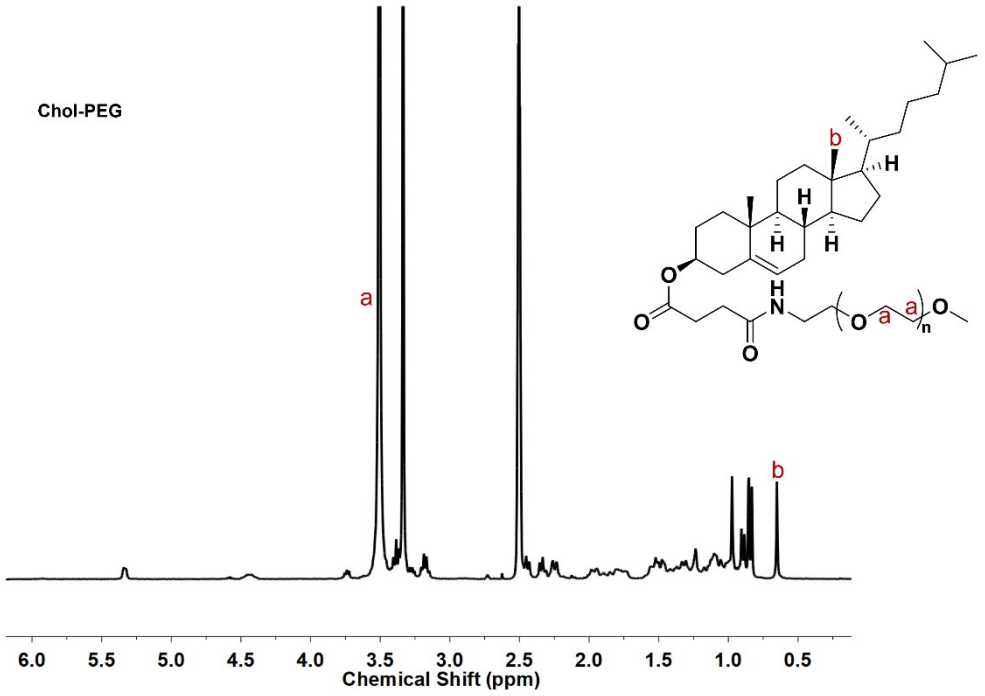

Figure S3. The ^{1}H NMR spectrum of Chol-PEG in DMSO-*d*.

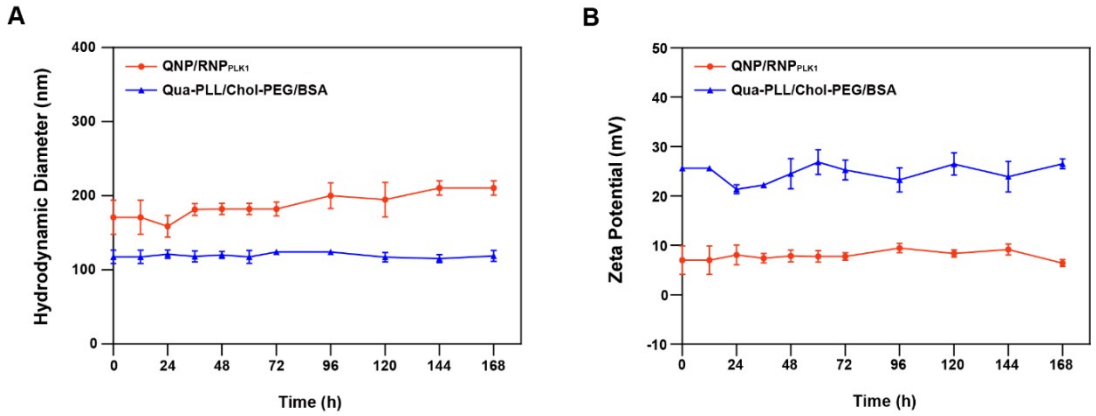

Figure S4. Hydrodynamic diameter (A) and zeta potential (B) changes of QNP/RNP$_{PLK1}$ and Qua-PLL/Chol-PEG/BSA during the incubation in PBS for 7 days. Data were presented as mean value ± SD of triplicate experiments.

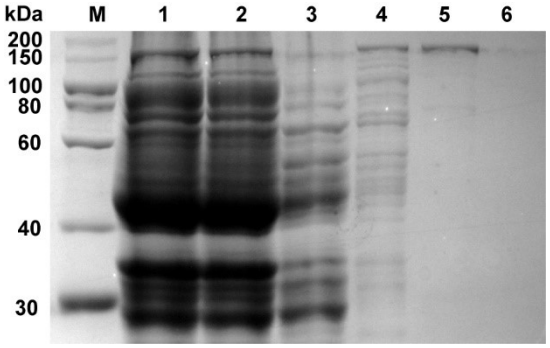

Figure S5. The SDS-PAGE analysis of purified Cas9. The calculated molecular weight of Cas9 was ~160 kDa. Lane M: protein marker; lane 1: lysates of whole bacterial cells; lane 2: supernatants of lysates; lane 3: effluent fractions of loading sample; lane 4: the fraction eluted with 50 mM imidazole; lane 5: the fraction eluted with 300 mM imidazole; lane 6: the fraction eluted with 500 mM imidazole.

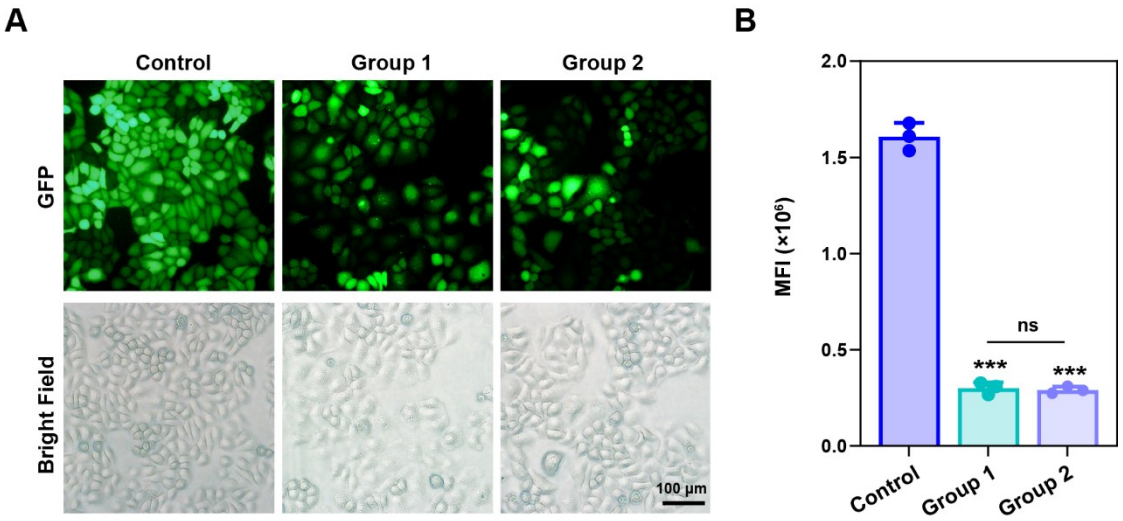

Figure S6. The *in vitro* GFP disruption of HeLa-GFP cells mediated by Lipo2000/RNP_{GFP} without ultrasonication (group 1) and with the ultrasonication for 30 min (group 2). A: fluorescence microscopy analysis; B: quantification of GFP expression in HeLa-GFP cells (***$p < 0.001$ *vs.* Control group; ns: no significance).

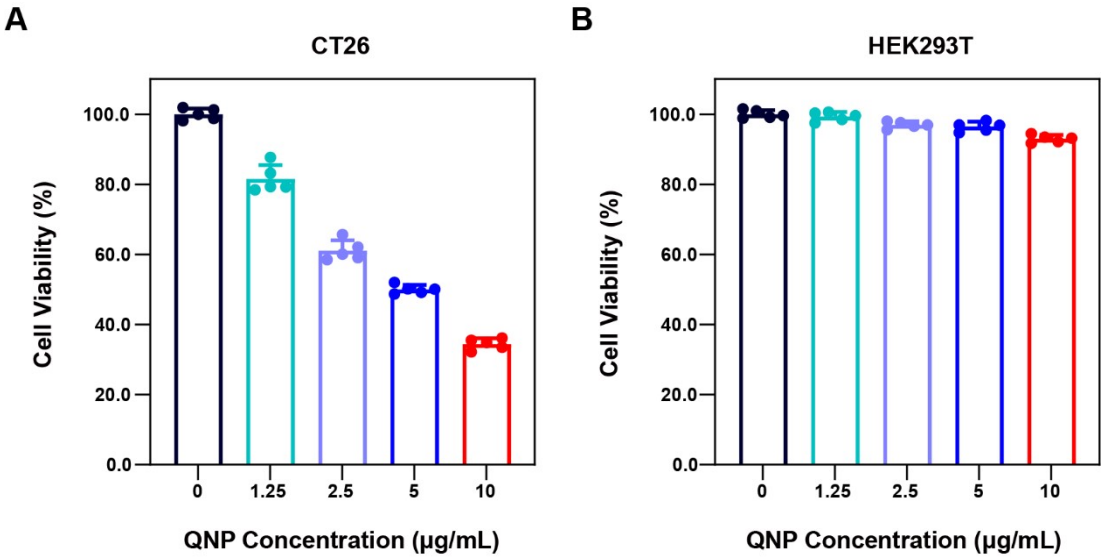

Figure S7. Cell viability of CT26 (A) and HEK293T (B) after the treatment with QNP/RNP_{PLK1} with different QNP concentrations (Cas9 concentration: 2 μg/mL). Data were presented as mean value ± SD of five experiments.

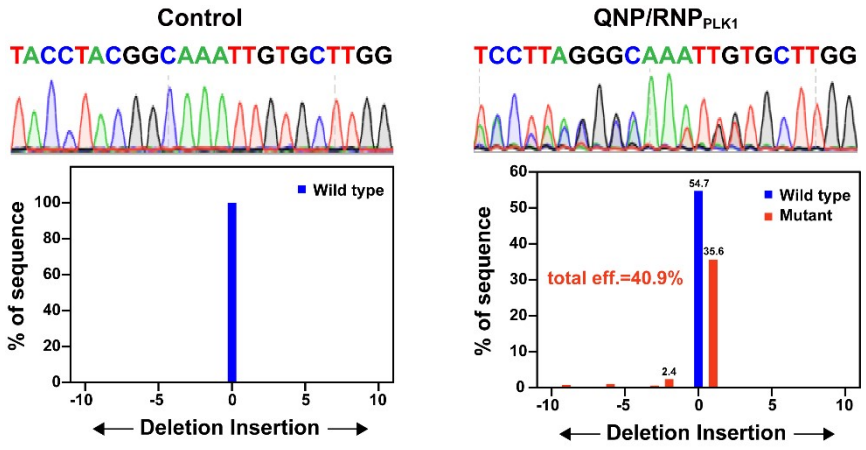

Figure S8. T−A cloning sequencing results of the targeted *PLK1* locus in MCF-7 cells treated with PBS and QNP/RNP_{PLK1}.

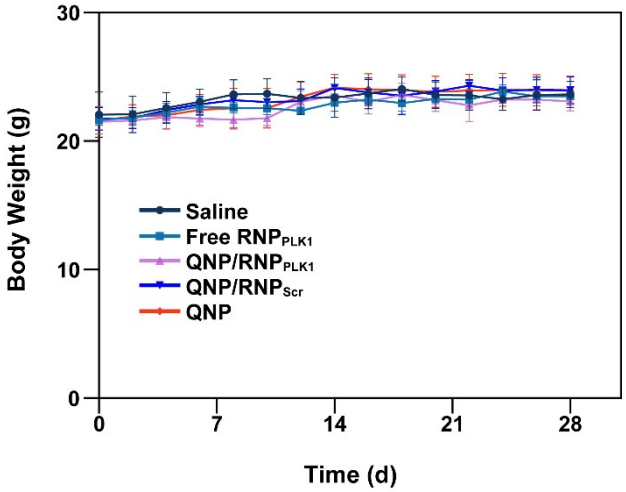

Figure S9. The changes of body weight within 28 days after different administration.