Supplementary Materials

Multifunctional Nucleus-targeting Nanoparticles with Ultra-high Gene Transfection Efficiency for *In Vivo* Gene Therapy

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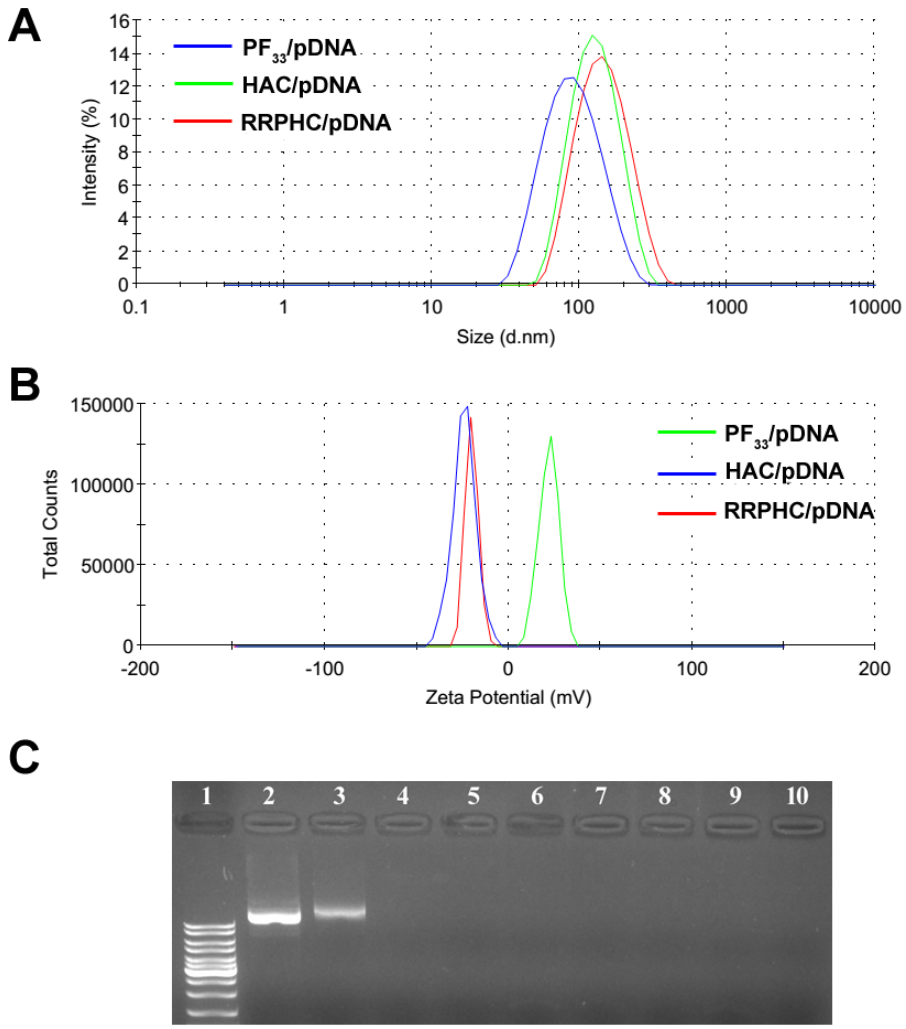

Fig. S1. (A, B) Particle size and zeta potential of the binary and ternary complexes measured by DLS. (C) Agarose gel electrophoresis of PF_{33}/pDNA complexes, HAC/pDNA complexes and RRPHC/pDNA complexes. Lane 1, DNA ladder; lane 2, naked pDNA; lane 3-8, PF_{33}/pDNA at mass ratios of 0.5:1, 1:1, 2:1, 4:1, 8:1, 10:1; lane 9, HAC/pDNA; lane 10, RRPHC/pDNA.

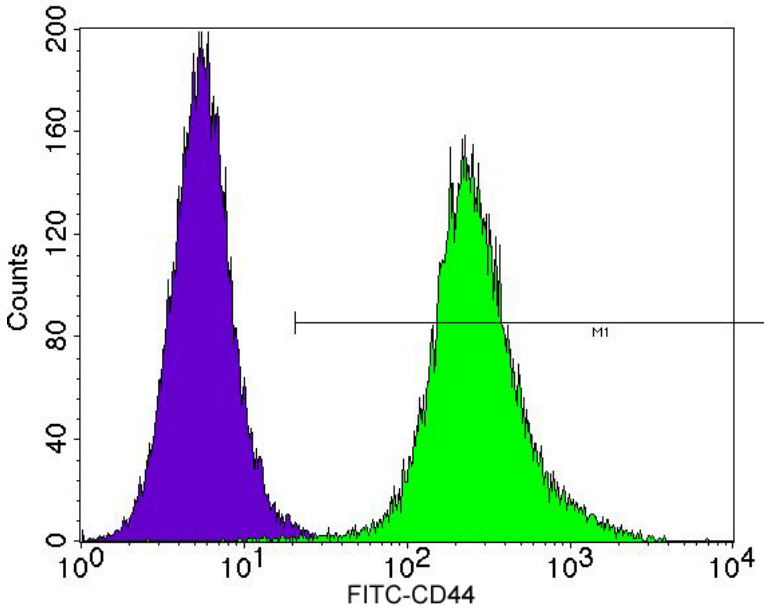

Fig. S2. Determination the expression level of CD44 receptor on the surface of HCT 116 cells by flow cytometry. Isotype control (purple).

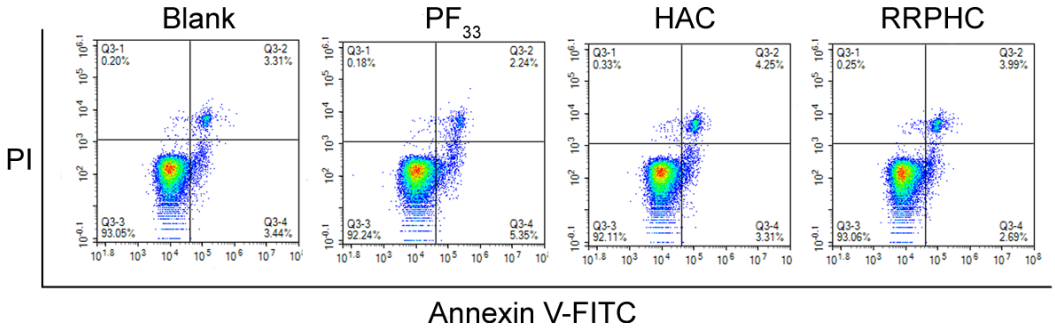

Fig. S3. *In vitro* apoptosis-inducing effect in HCT 116 cells after treatment with PF_{33}, RRPH, HA and RRPH materials at 24 h. *$p < 0.05$, **$p < 0.01$ and ***$p < 0.001$.

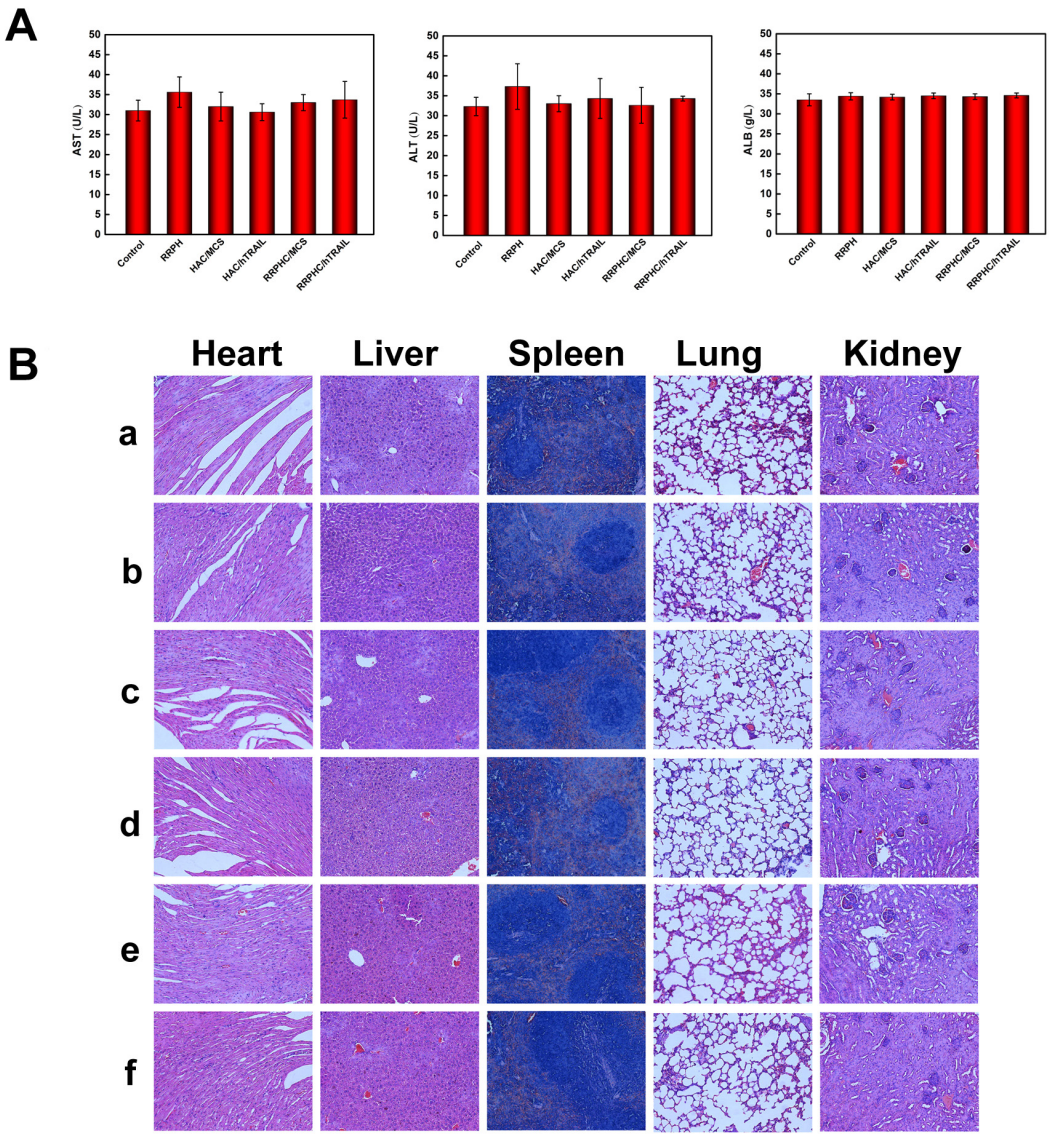

Fig. S4. Safety and toxicity evaluation. (A) Serum AST, ALT and ALB levels of mice after treatment with different formulations. (B) Histological examination of H&E staining of vital organ sections. PBS (a), RRPH (b), HAC/MCS (c), HAC/hTRAIL (d), RRPHC/MCS (e) and RRPHC/hTRAIL (f).

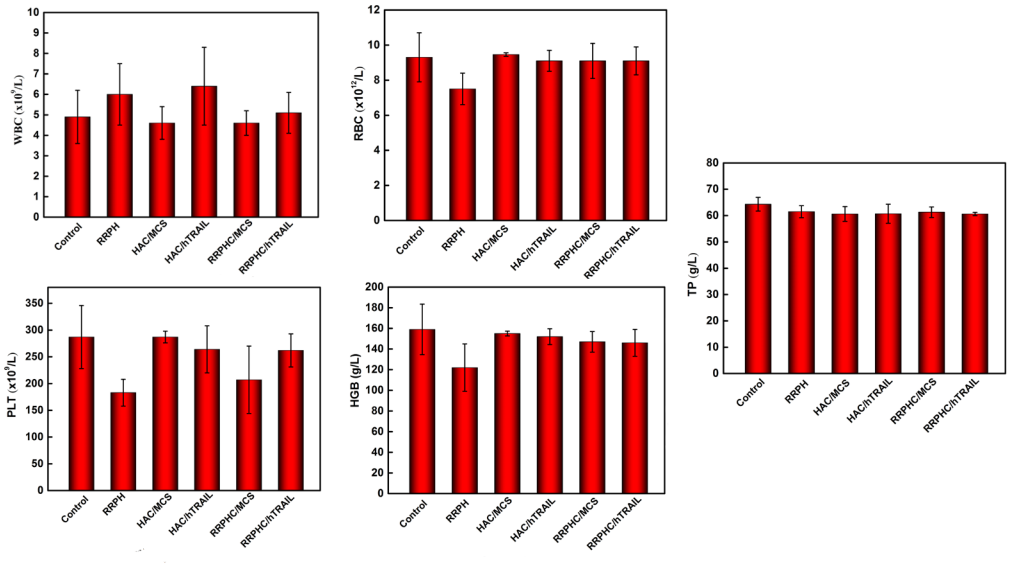

Fig. S5. Complete blood count (CBC) test after treatment with different formulations.