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Photoresponsive endosomal escape enhances gene delivery using liposome-polycation-DNA (LPD) nanovector

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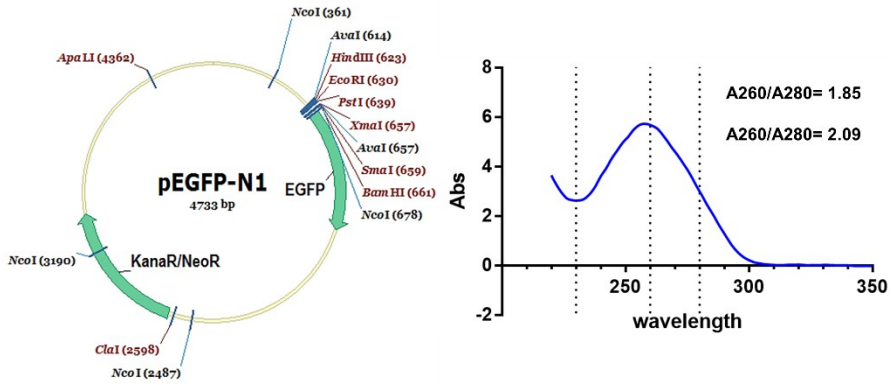
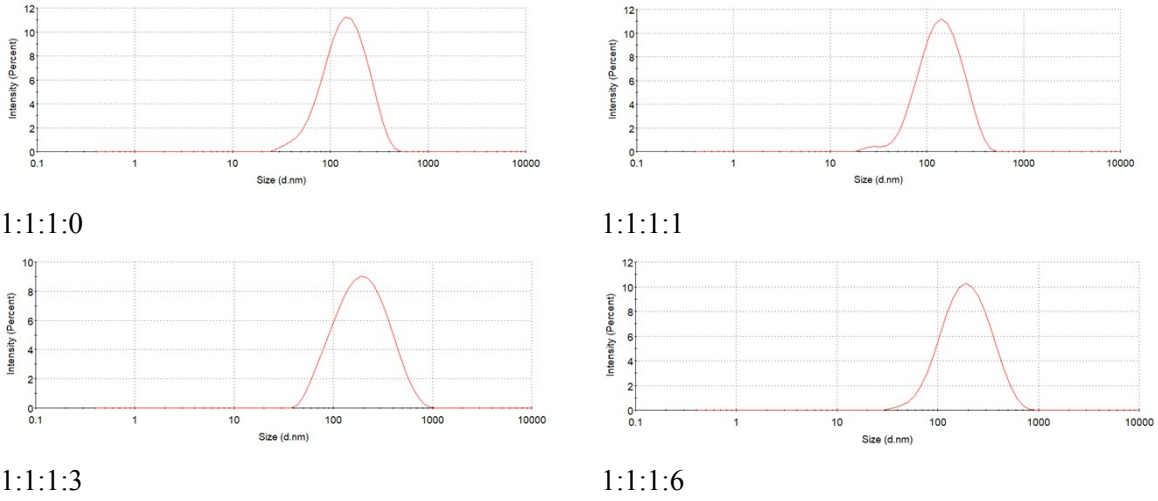
Table S1 Average size, PDI and zeta potential of liposome formulations with different Chol% content.

Liposome formulations (DOTAP/DSPE-PEG/DOPE/Chol) (molar ratio)	Size (nm)	PDI	Zeta potential (mV)
1:1:1:0	121.6 ± 2.7	0.41 ± 0.01	17.5 ± 0.9
1:1:1:1	136.1 ± 4.7	0.40 ± 0.03	14.0 ± 1.7
1:1:1:3	150.1 ± 2.1	0.42 ± 0.02	13.6 ± 0.7
1:1:1:6	149.5 ±1.5	0.45 ± 0.02	11.9 ± 0.5

a.



b.



1:1:1:0 1:1:1:1

1:1:1:3 1:1:1:6

Figure S1 (a) Plasmid map of pEGFP-N1 (left) and absorbance spectra of the pDNA (right).

(b) The size distribution of liposomes with different formulations (molar ratio of DOTAP/DSPE-PEG/DOPE/Chol)

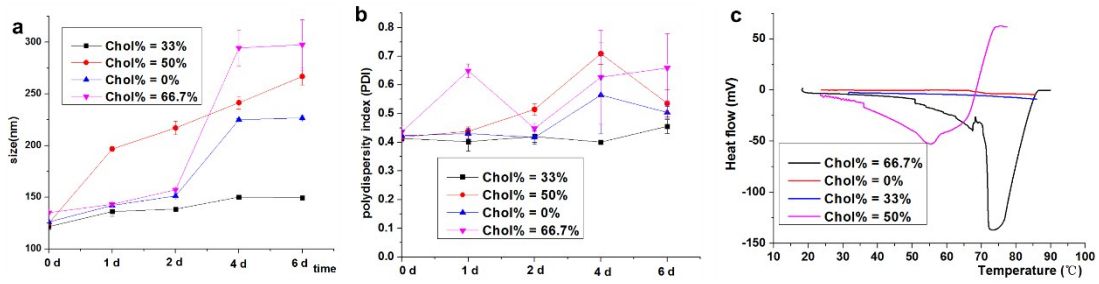


Figure S2 Size changes (a) and PDI changes (b) of liposomes with different Chol% in 6 days. (c) DSC heatflow diagram of liposomes with different Chol%.

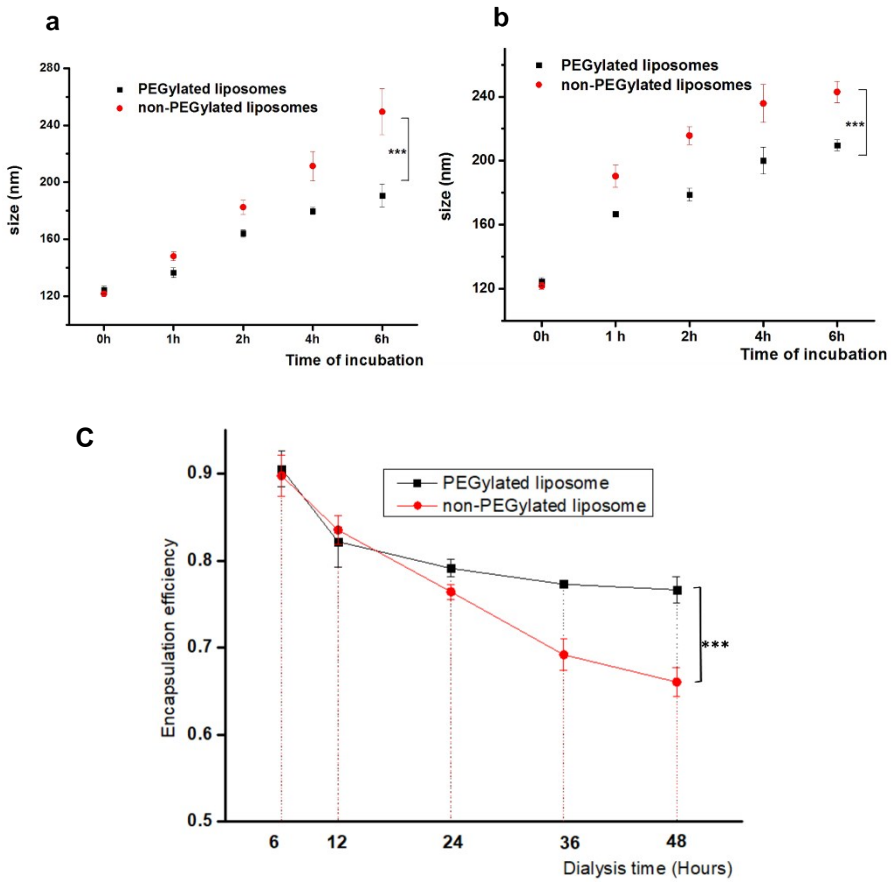


Figure S3 The size change of PEGylated and non-PEGylated liposomes at different time points after incubation with (a) optiMEM and (b) serum-contained culture medium; (c)VP release profile from liposomes at different time points . ***$P<0.0001$.

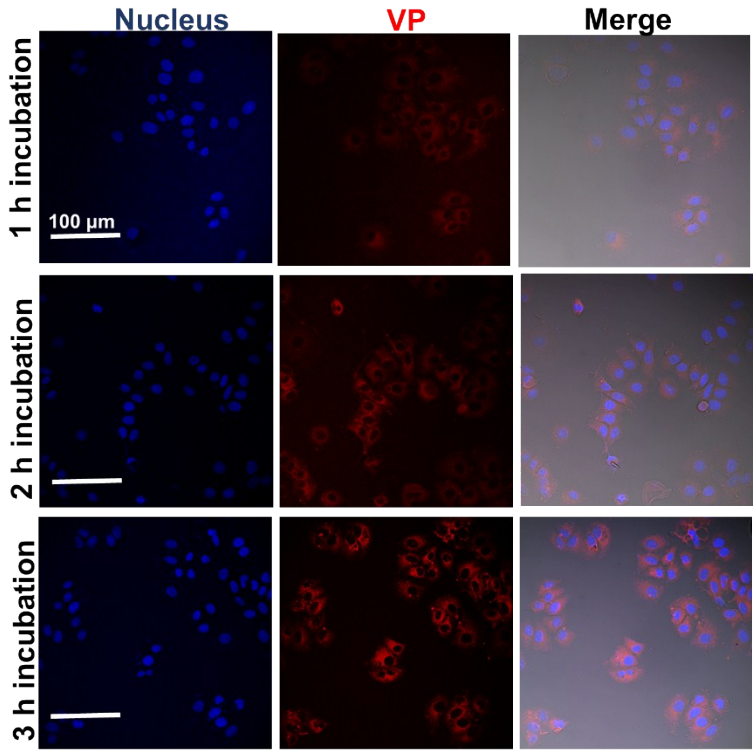


Figure S4. CLSM images of cellular uptake of lipopolyplexes loaded with VP molecules (red colour) at different incubation time points. The merge panel represent the images merged by the blue, red and bright field channels. Scale bars = 100 µm.

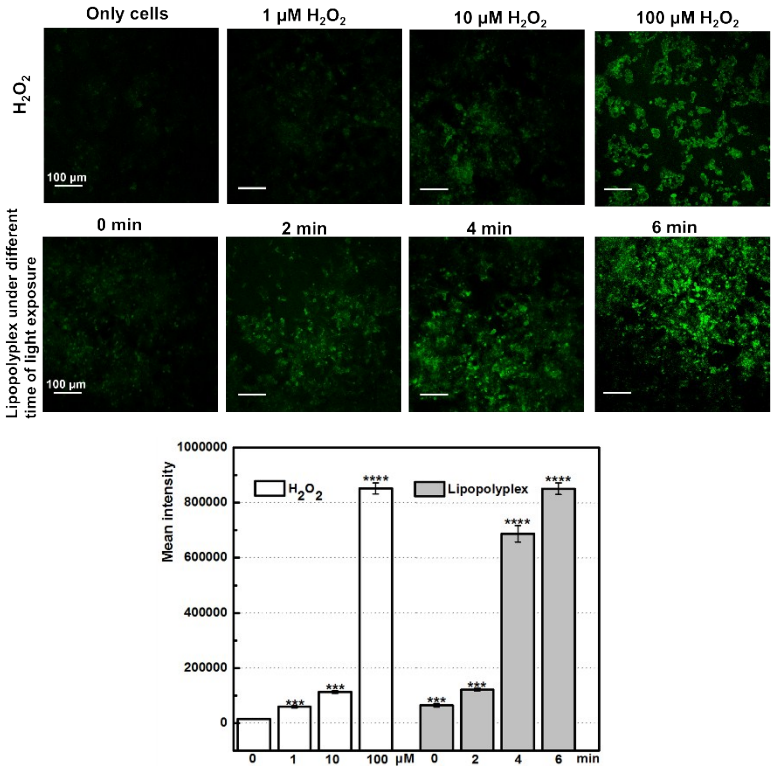


Figure S5. Cellular ROS detection from VP after light illumination. CLSM images of DCF fluorescence signal after cellular ROS generation with and without light illumination and quantitative assessment of DCF fluorescence intensity. Scale bars = 100μm. ***p <0.001 and ****p <0.0001 compared to the only cells group.

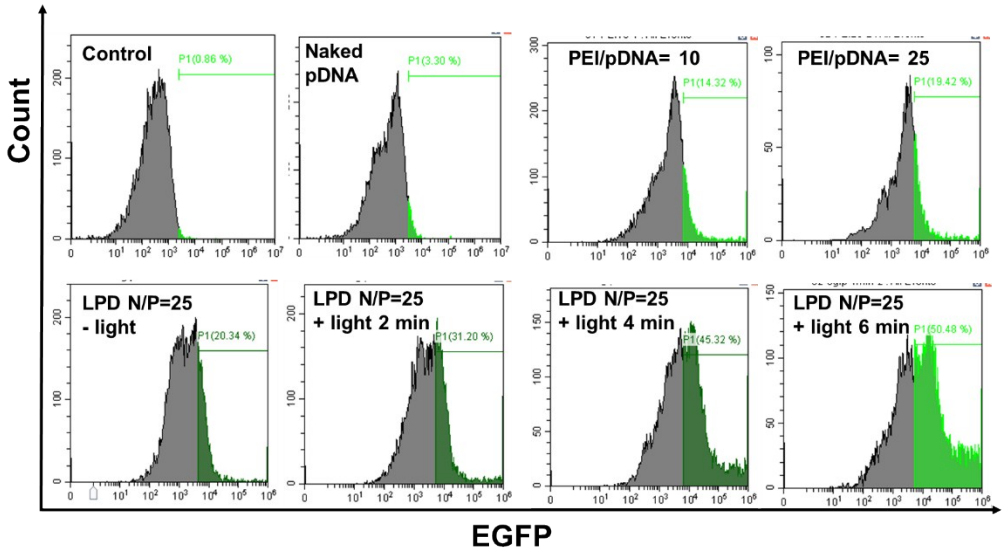


Figure S6 Representative flow cytometry histograms of EGFP intensity in HCT 116 cells transfected by pure pDNA, polyplexes at varying PEI/pDNA levels and LPDs with and without light illuminations.