

## Supporting Information

### **Cationic polymer synergizing with the disulfide-containing enhancer achieved efficient nucleic acid and protein delivery**

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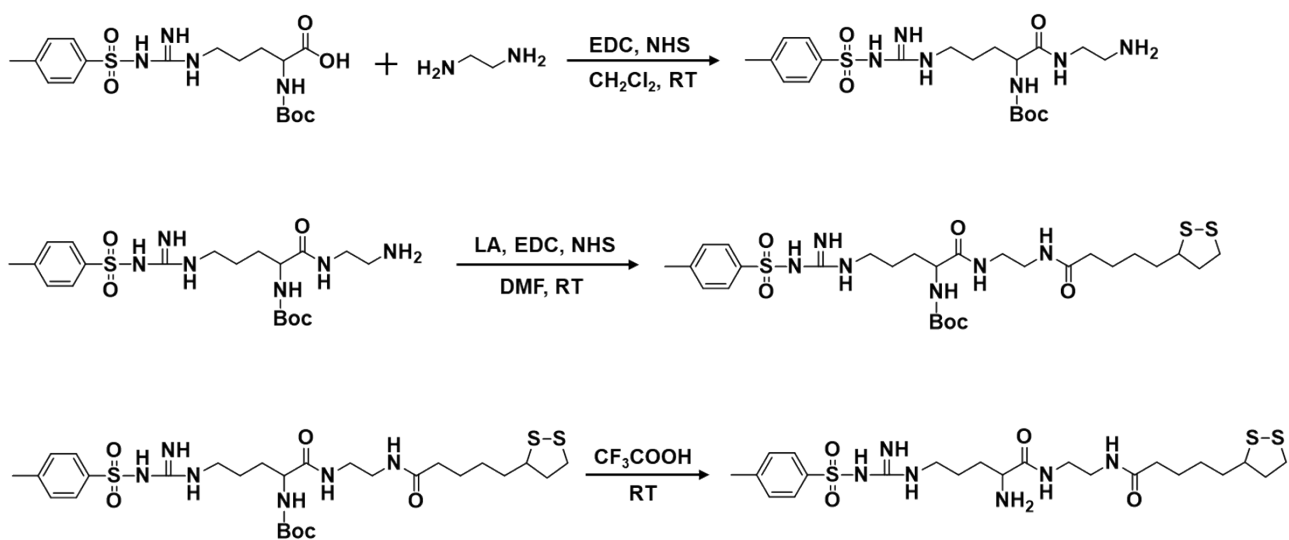


Fig. S1 Synthesis pathway of LA-RT.

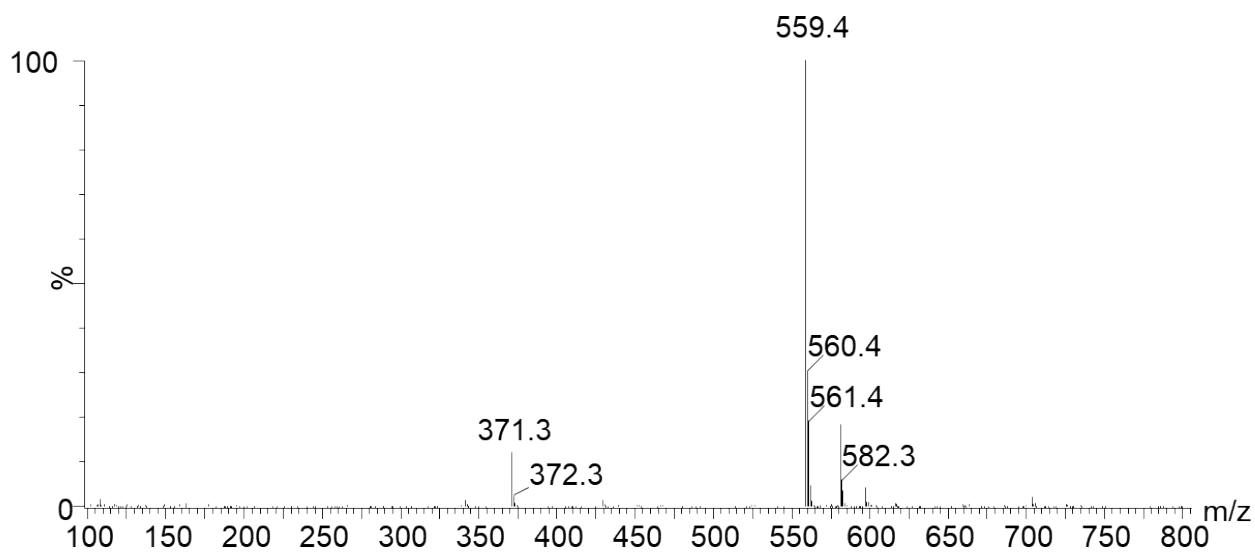


Fig. S2 ESI-MS of LA-RT.

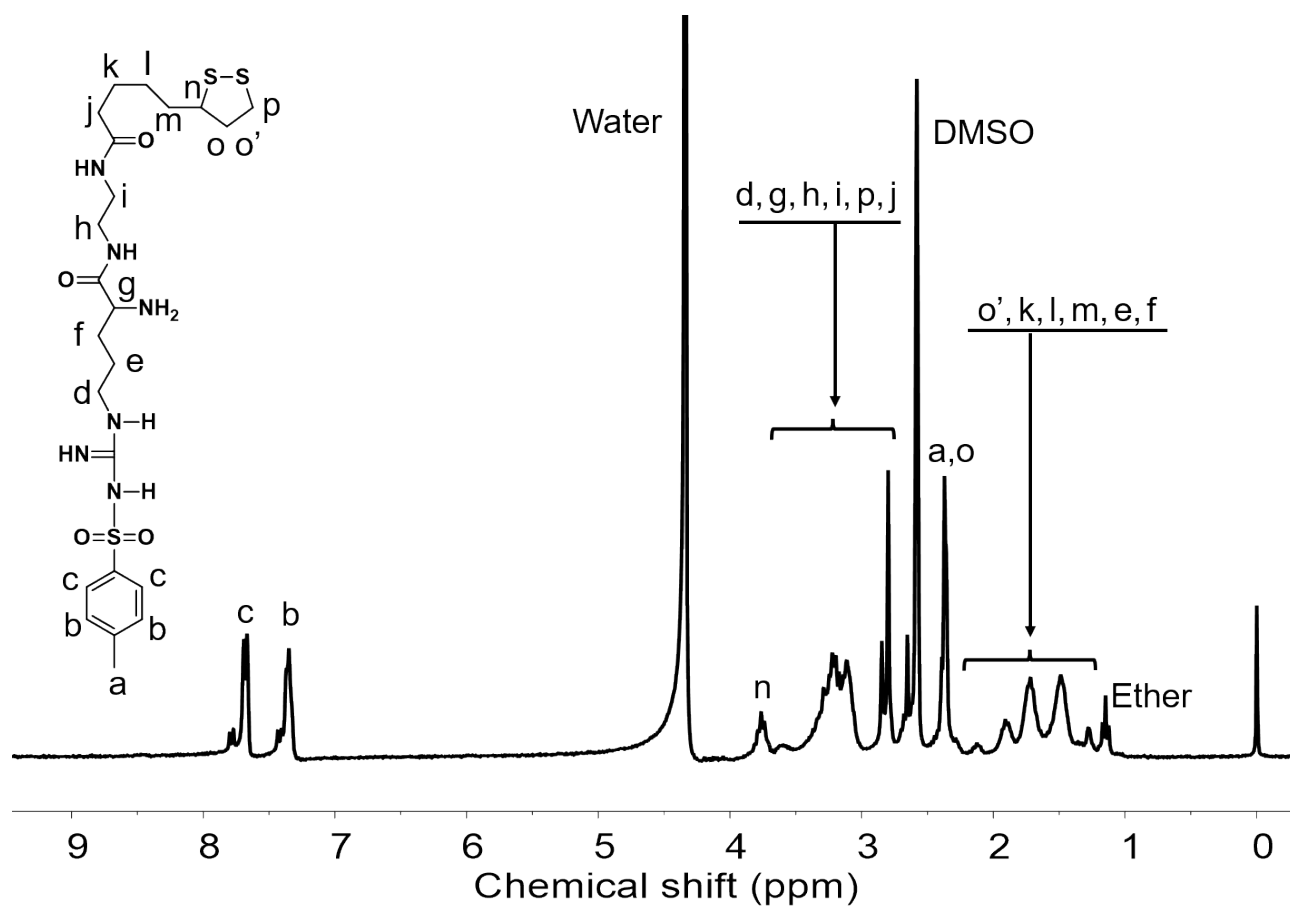


Fig. S3  $^1\text{H}$  NMR of LA-RT (300 MHz,  $\text{D}_2\text{O}/\text{DMSO-d}_6$  (v/v) = 1/1)

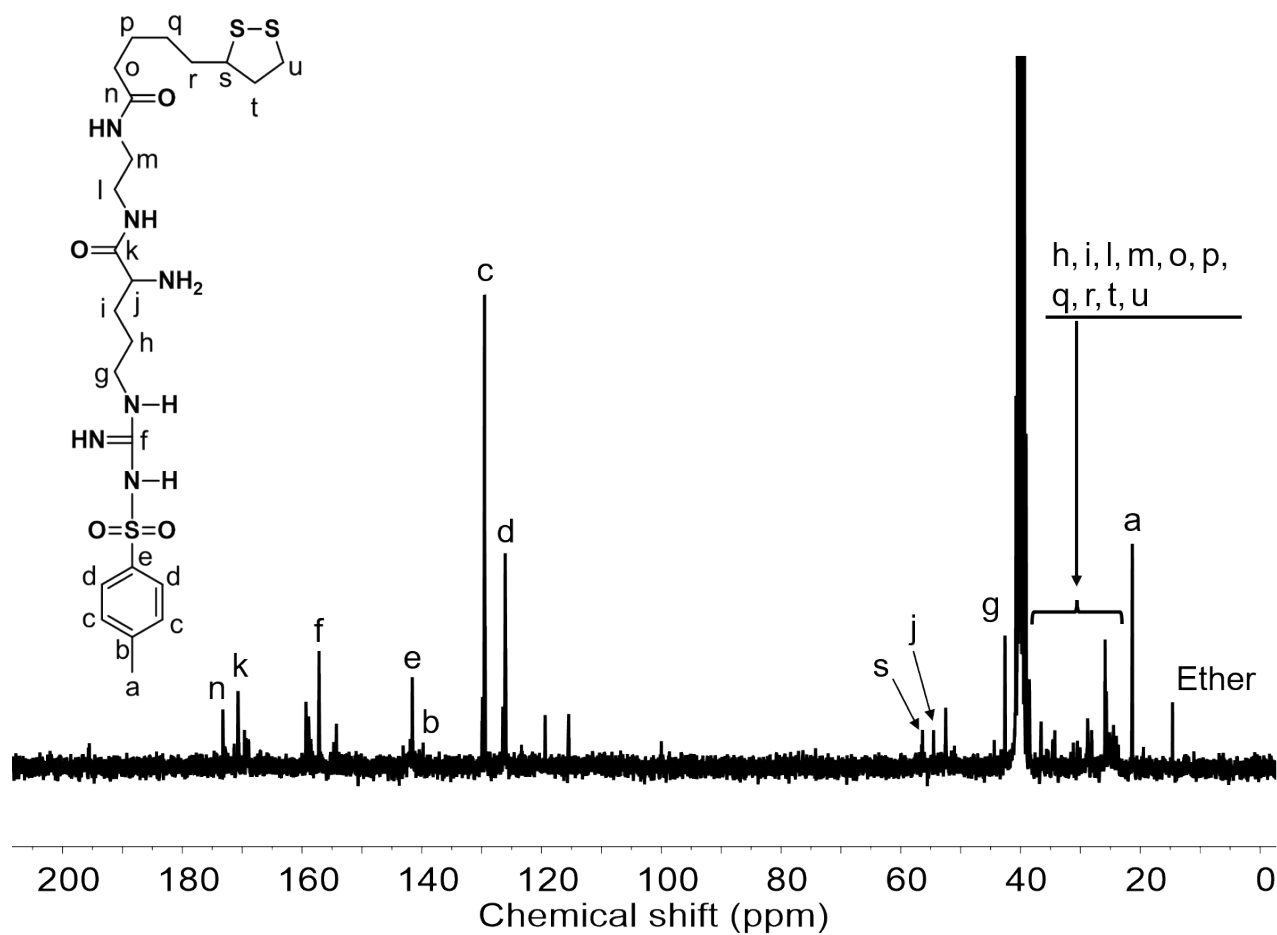


Fig. S4 <sup>13</sup>C NMR of LA-RT (300 MHz, DMSO-d<sub>6</sub>)

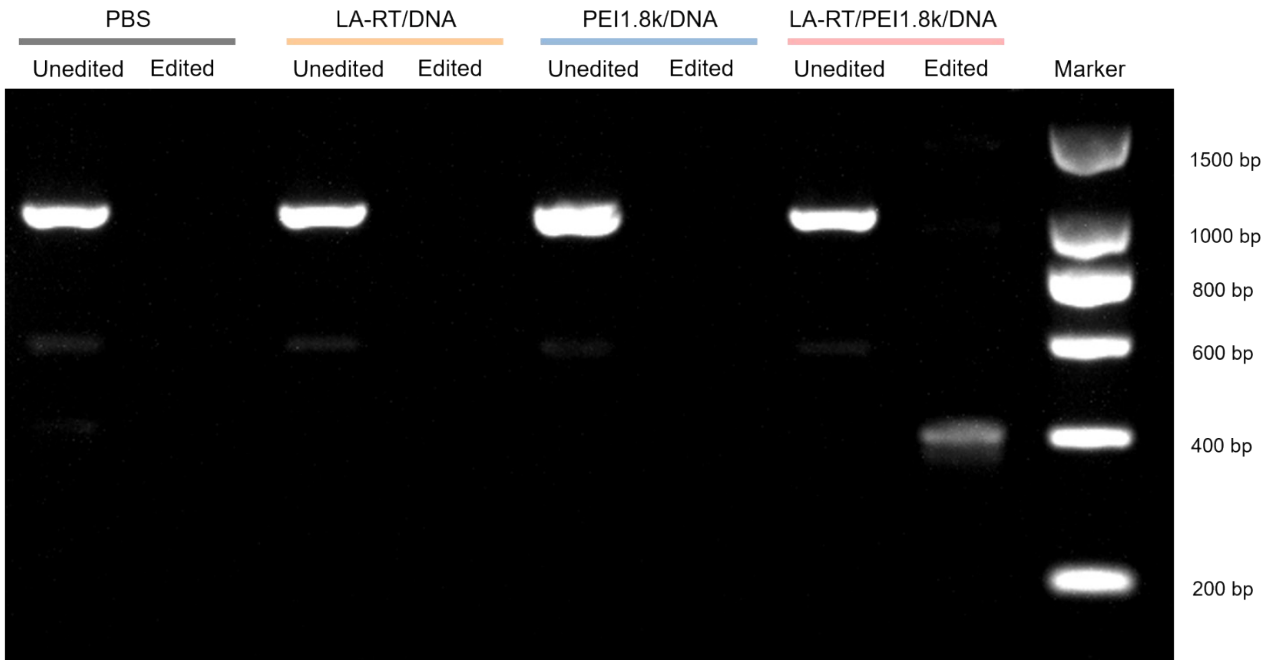


Fig. S5 The DNA gel electrophoresis photo of PD-L1 genes.

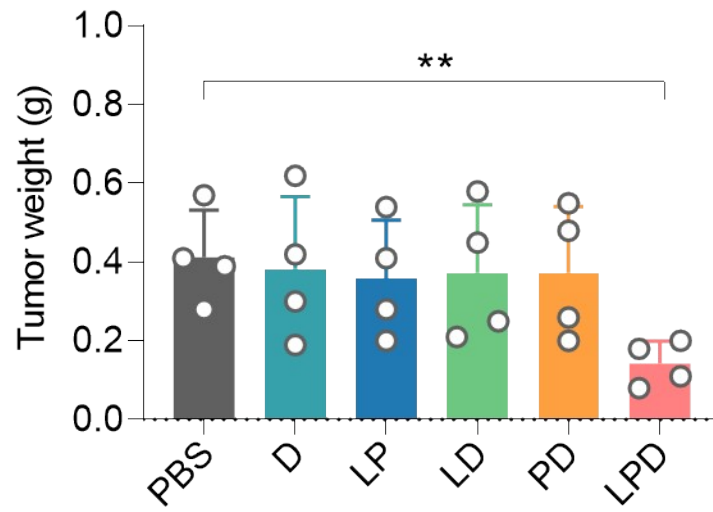


Fig. S6 The weight of tumor tissues from different treatment groups.

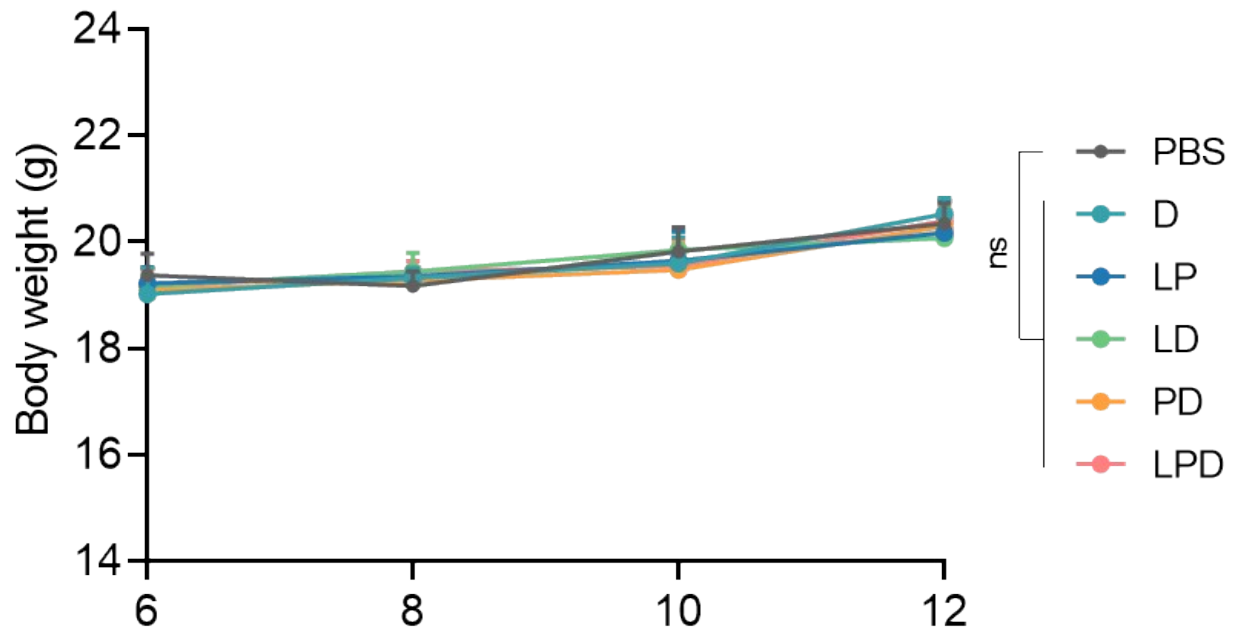


Fig. S7 The body weight of mice during the treatment.



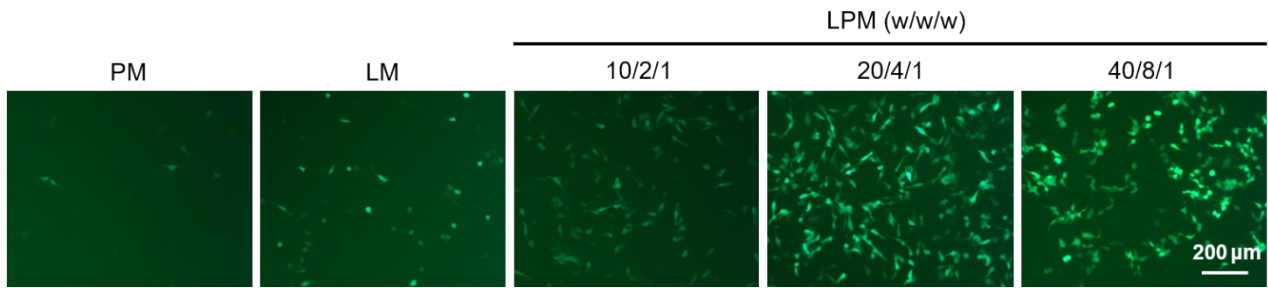


Fig. S8 The EGFP mRNA transfection of PEI1.8k/mRNA, LA-RT/mRNA, and LA-RT/PEI1.8k/mRNA with different mass ratio in B16F10 cells.

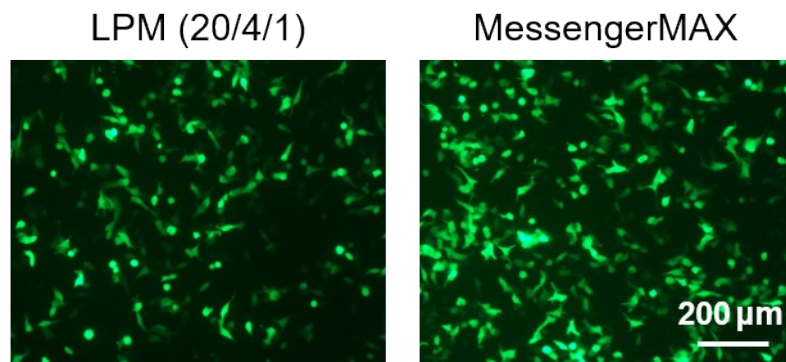


Fig. S9 The EGFP mRNA transfection of LA-RT/PEI1.8k/mRNA and MessengerMAX in B16F10 cells.

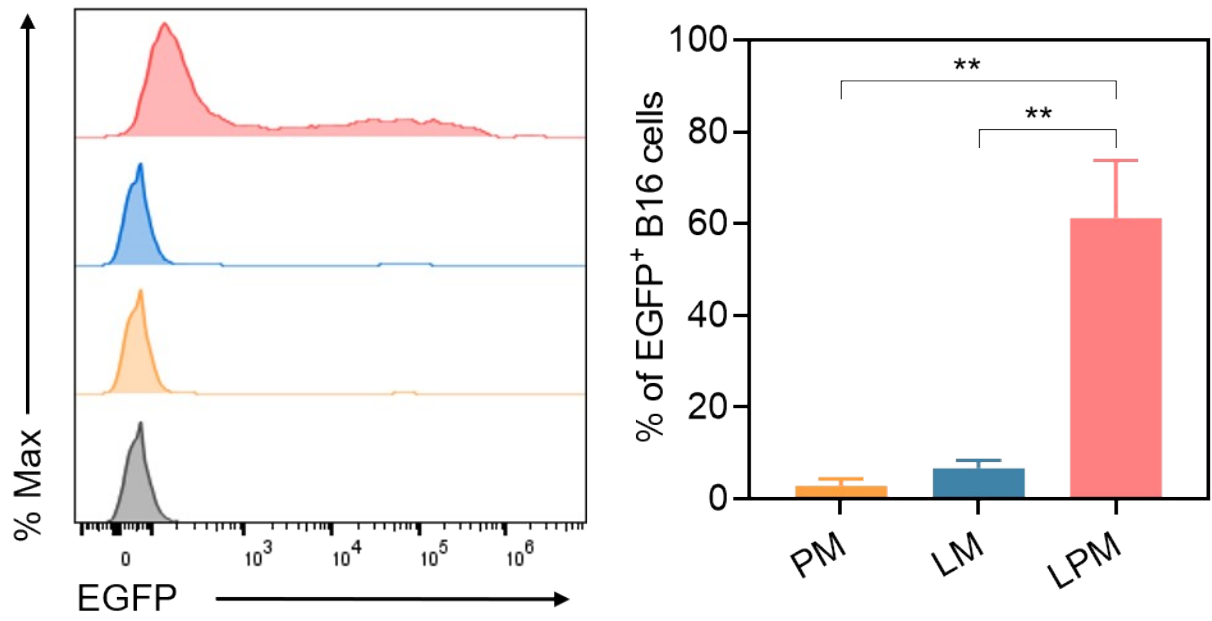


Fig. S10 The EGFP mRNA expression in B16F10 of PEI1.8k/mRNA, LA-RT/mRNA, and LA-RT/PEI1.8k/mRNA characterized by flow cytometry.

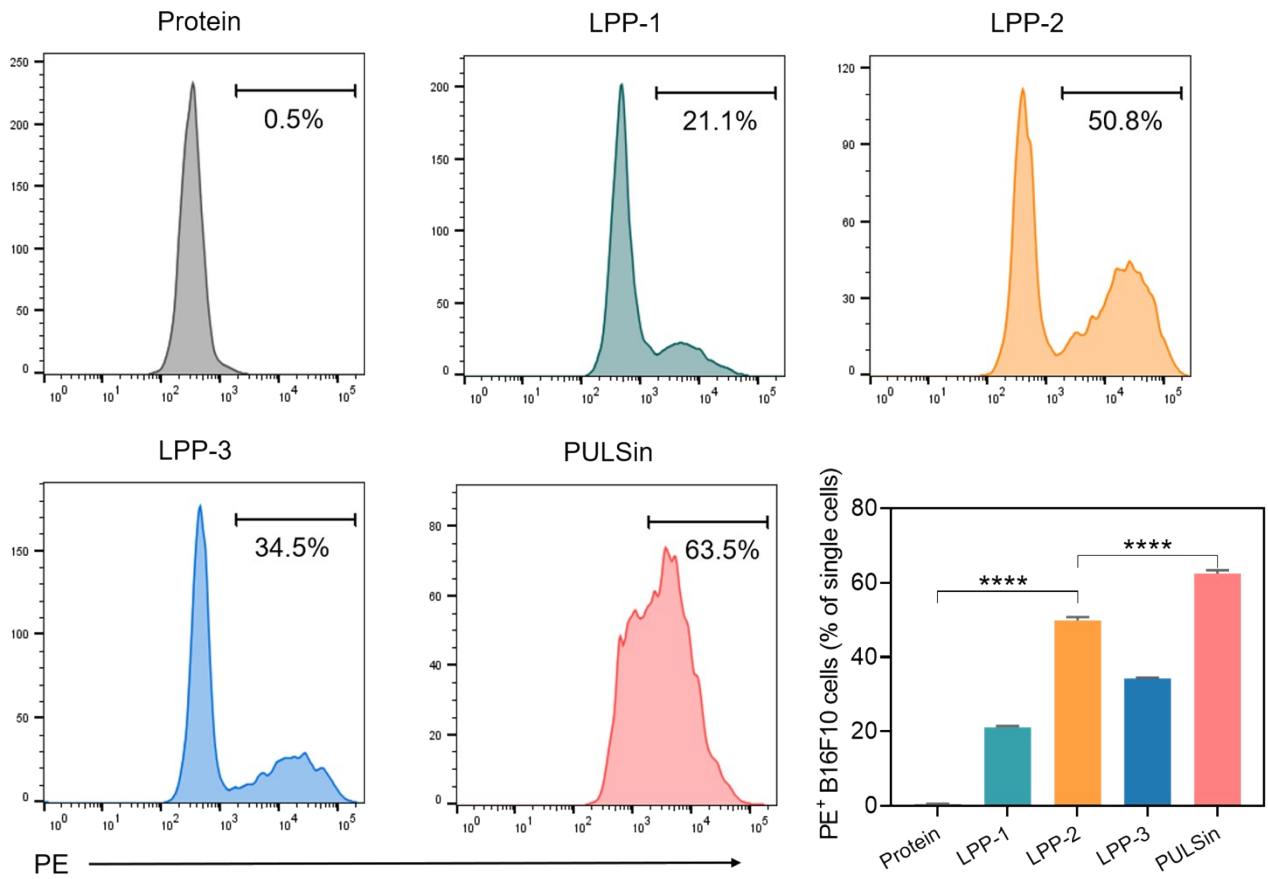


Fig. S11 The protein transfection of LA-RT/PEI1.8k/protein (LPP) with different mass ratio and PULSin. The mass ratio of LA-RT/PEI1.8k/protein was 5/1/1 for LPP-1, 10/2/1 for LPP-2 and 20/4/1 for LPP-3.

**Table S1.** Plasmid DNA sequence for SgRNA transcription.

<b>SgRNA</b>	<b>DNA sequence in plasmid</b>
SgRNA-EGFP	gtgaaccgcatcgagctgaagtttagagctagaaatagcaagttaaataaggct agtccggtatcaactgaaaaagtggcaccgagtcggtgc
SgRNA-PD-L1-1	aatcaaccagagaatttccggttttagagctagaaatagcaagttaaataaggcta gtccggtatcaactgaaaaagtggcaccgagtcggtgc
SgRNA-PD-L1-2	gtatggcagcaacgtcacgagtttagagctagaaatagcaagttaaataaggct agtccggtatcaactgaaaaagtggcaccgagtcggtgc

**Table S2.** Primers for RT-PCR.

<b>Gene</b>	<b>Primers</b>	
<i>Unedited PD-L1</i>	Forward	GGA GCG CAC GGC TTC TCC AC
	Reverse	AGA GCT GGG GGA TCG GGT GC
<i>Edited PD-L1</i>	Forward	CAC CCC CGC CCC ATG AAG TT
	Reverse	TTC GCT GTG GCG TTG ACC CT

**Table S3.** Antibodies for flow cytometry.

<b>Antibodies</b>	<b>Company</b>	<b>Catalog No.</b>
Anti-CD3	Biolegend	100306
Anti-CD4	Biolegend	116016
Anti-CD8	Biolegend	100712
Anti-CD80	Biolegend	104714
Anti-CD86	Biolegend	105030
Anti-OVA257-264/H-2K <sup>b</sup>	Ebioscience	12-5743-82
Anti-PD-L1	Biolegend	124313