Supplemental Information

1. The Characterization of Cationic Lipid DAO3

Fig. S1  Structure characterization of DAO3 (A: IR; B: HR-ESI-MS).

Fig. S2  Structure characterization of lipid DAO3. (A: $^1$H NMR; B: $^{13}$C NMR. The peak labelled “CH$_3$OD” is the solvent signal.)
Fig. S3  HPLC of cationic lipid of DAO3, and HPLC purity was 97.2% ± 2.5 (n=5).

2. TEM of Cationic Liposomes

Fig. S4  Negativ-stain transmission electron micrographs of cationic liposomes (A1: DAO3, A2: DDCTMA)

3. The Turbidity of Liposomes

Fig. S5  The turbid degree of liposomes DAO3 and DDCTMA.
4. Fluorescence Microscopic Images of pGFP-N2 Gene Expression In Vitro

Fig. S6  Fluorescence microscopy images of Hep-2 and NCI-H460 cells after transfection with DAO3/pGFP-N2, and DDCTMA/pGFP-N2 at different N/P ratios.

5. The Weight Changes of Mice

Fig. S7  The weight changes of mice after injections of lipoplexes.(n=3)