Nanoparticle-mediated mRNA delivery to Triple-negative breast cancer (TNBC) Patient-derived xenograft (PDX) tumors

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EGFP mRNA (N1-Methylpseudouridine/m1Ψ) ORF sequence:

ATGGTGAGCAAGGGCGAGGAGCTGTTCACCGGGGTGGTGCCCATCCTGGTCG
AGCTGGACGGCGACGTAAACGGCCACAAGTTCAGCGTGTCCGGCGAGGGCGA
GGGCGATGCCACCTACGGCAAGCTGACCCTGAAGTTCATCTGCACCACCGGCA
AGCTGCCCGTGCCCTGGCCCACCCTCGTGACCACCCTGACCTACGGCGTGCA
GTGCTTCAGCCGCTACCCCGACCACATGAAGCAGCACGACTTCTTCAAGTCCG
CCATGCCCGAAGGCTACGTCCAGGAGCGCACCATCTTCTTCAAGGACGACGGC
AACTACAAGACCCGCGCCGAGGTGAAGTTCGAGGGCGACACCCTGGTGAACC
GCATCGAGCTGAAGGGCATCGACTTCAAGGAGGACGGCAACATCCTGGGGCA
CAAGCTGGAGTACAACTACAACAGCCACAACGTCTATATCATGGCCGACAAGCA
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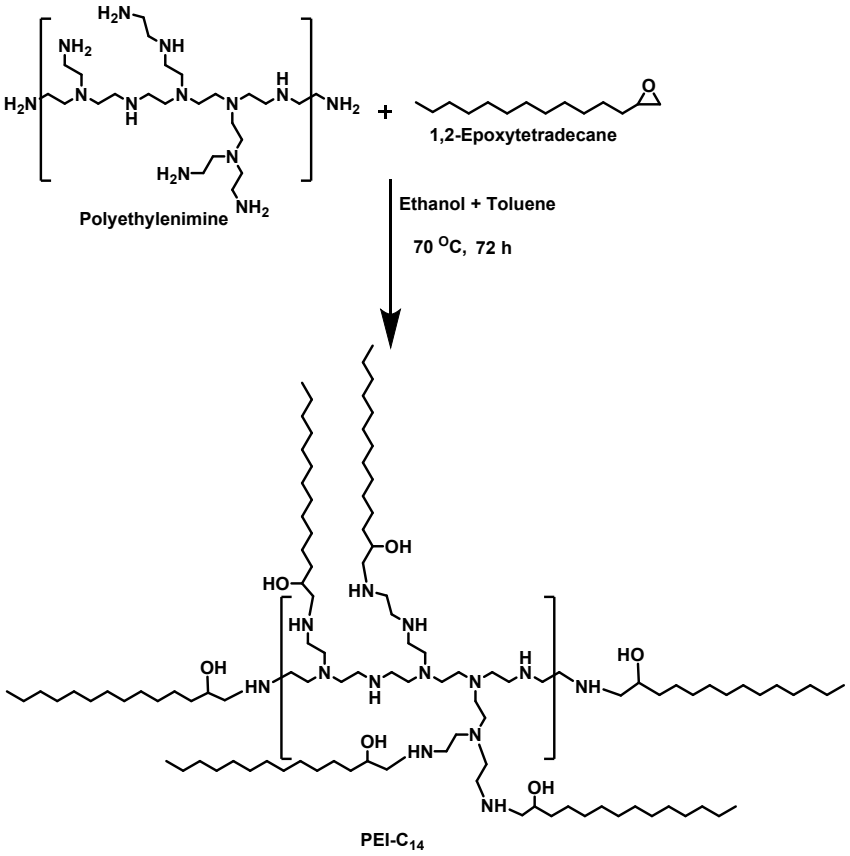

Figure S1. PEI-C_{14} lipid synthetic route: epoxide ring opening by polyethylenimine in presence of ethanol and toluene solvents at 70 °C.

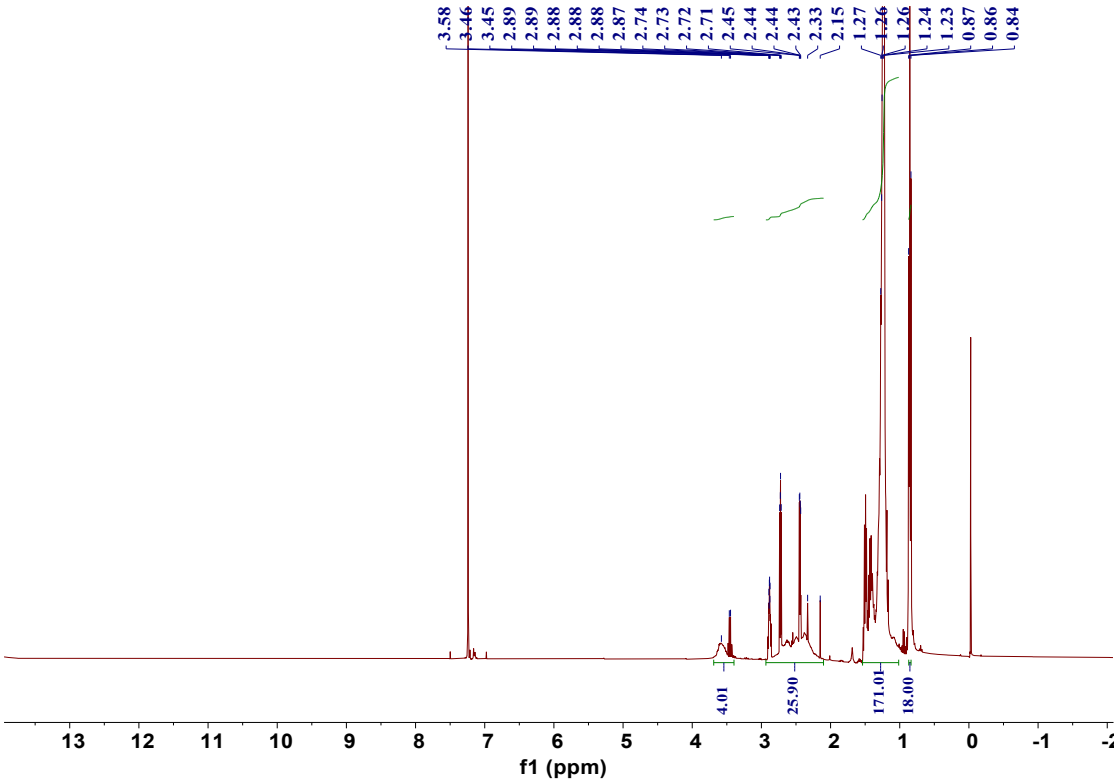

Figure S2. ^{1}H (400 MHz Bruker AVANCE) NMR Spectrum of PEI-C_{14} lipid; ^{1}H NMR (400 MHz, $CDCl_3$) δ 3.71 – 3.30 (m, 4H), 2.91 – 2.10 (m, 26H), 1.51-1.24 (d, m 171H), 0.92 – 0.76 (m, 18H).

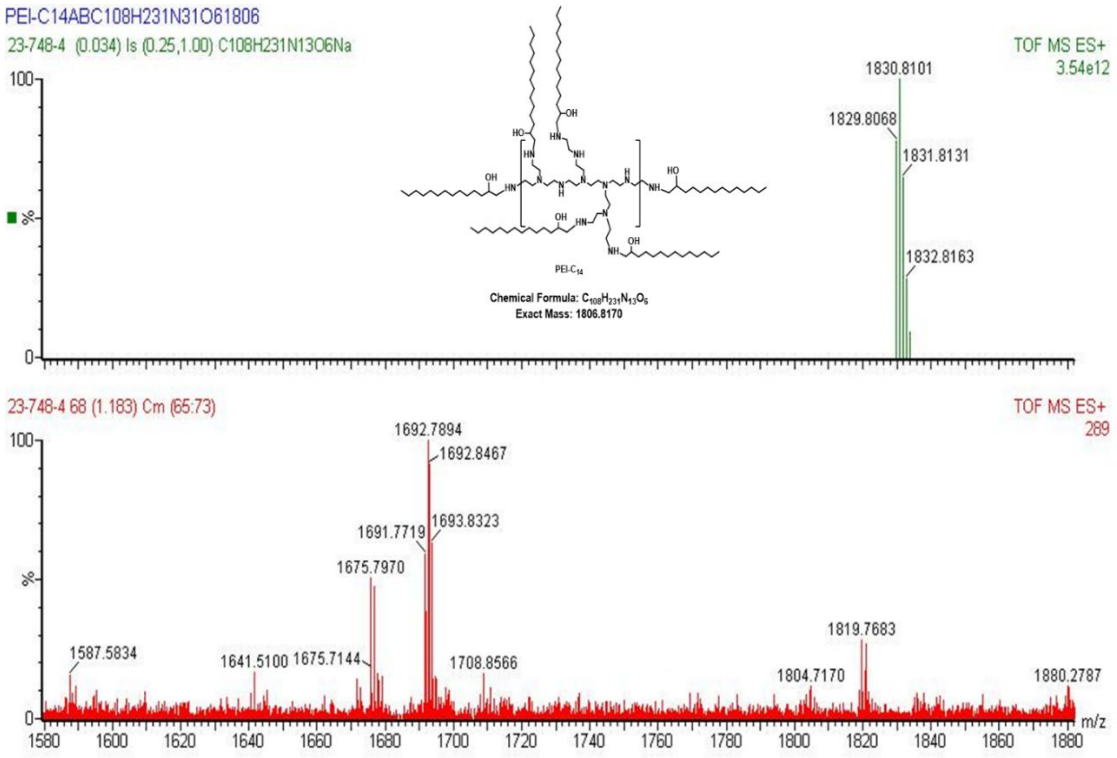

Figure S3. Mass spectrum of PEI-C_{14} lipid. Exact mass of lipid 1806.8170; founded as M+Na 1830.8101.

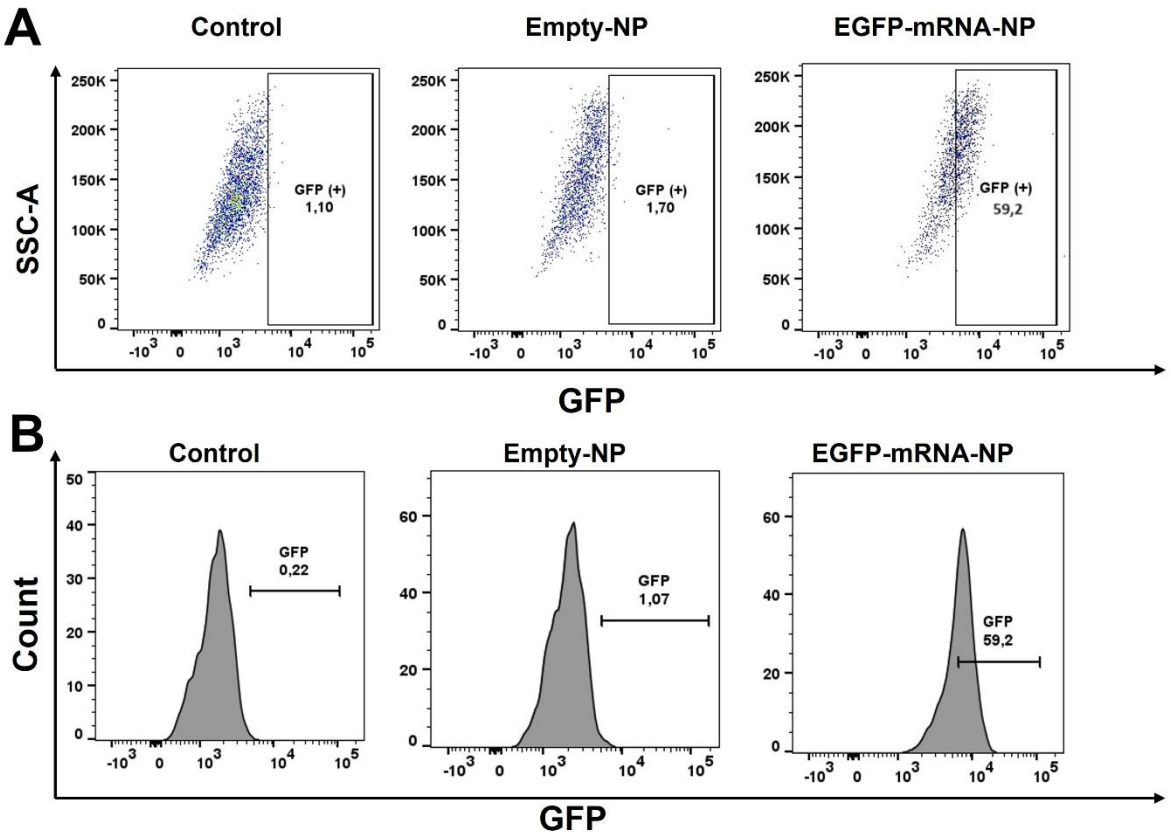

Figure S4: Flow cytometry SSC-A plots (A) and histograms (B) for GFP positive cells; EGFP-mRNA-NP and Empty-NP treatment to MDA-MB-231 cells after 48 h recorded GFP by flow cytometry; Control is non-treated cells (Plots are representing from one of the biological replicates).

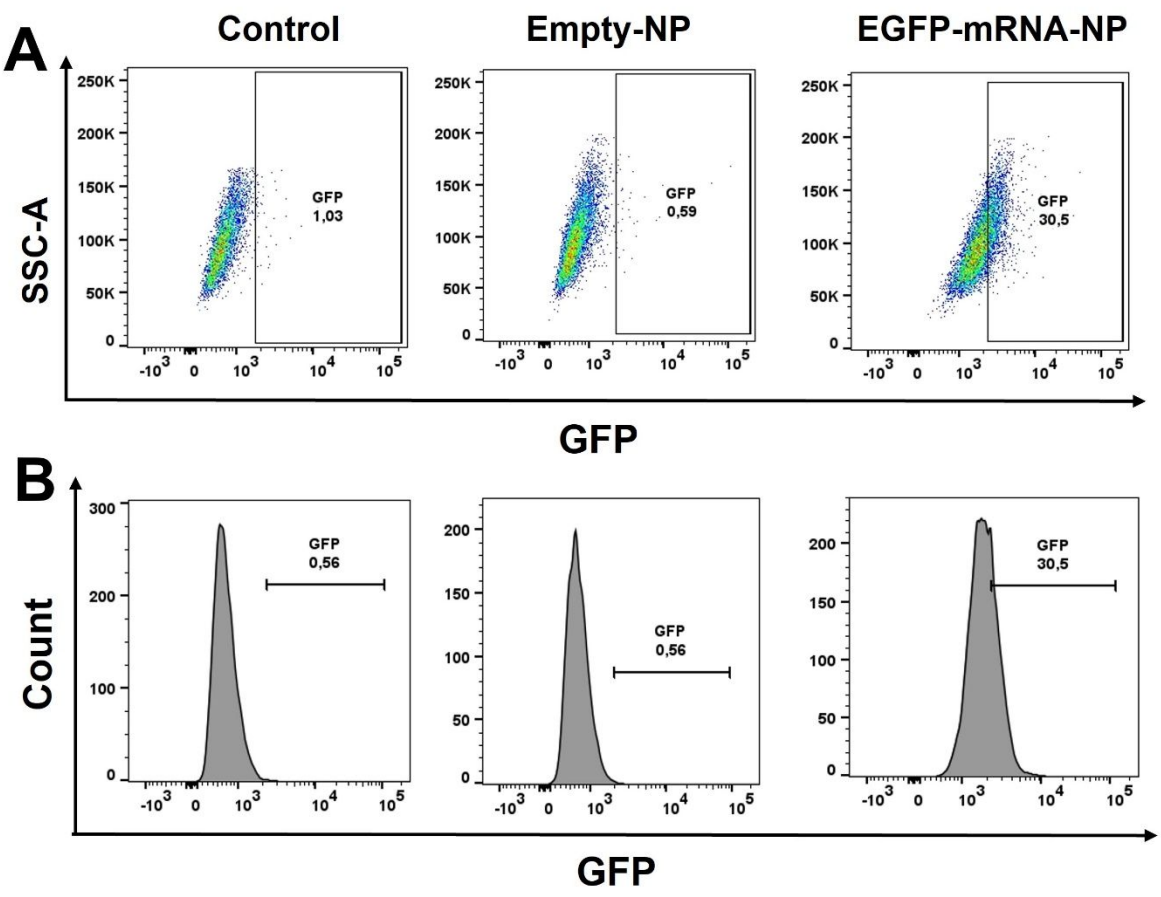

Figure S5: Flow cytometry SSC-A plots (A) and histograms (B) for GFP positive cells; EGFP-mRNA-NP and Empty-NP treatment to SUM-149 cells after 48 h recorded GFP by flow cytometry; Control is non-treated cells (Plots are representing from one of the biological replicates).

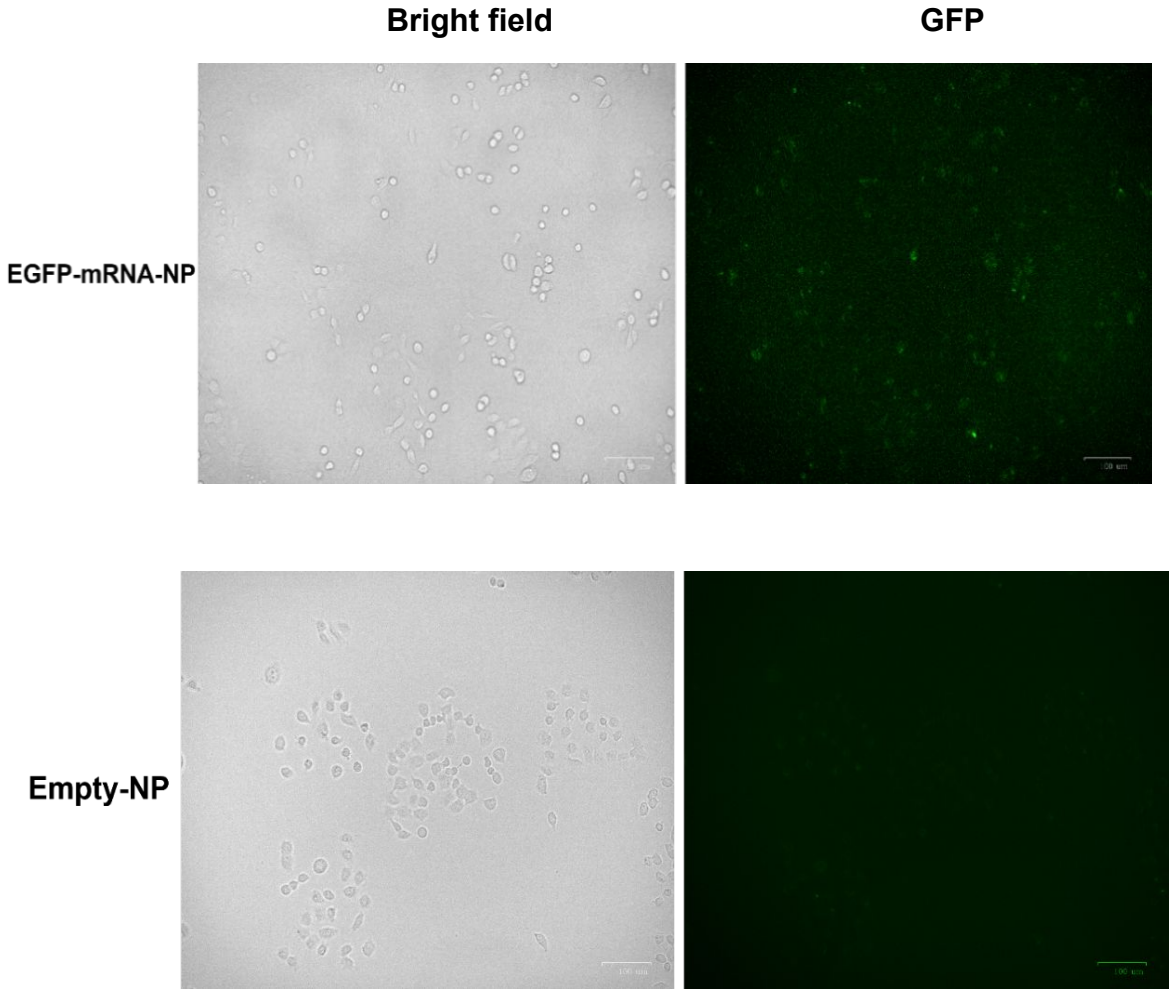

Figure S6: GFP fluorescence images of SUM-149 cells after 48 h treatment with EGFP-mRNA-NPs and Empty-NPs.

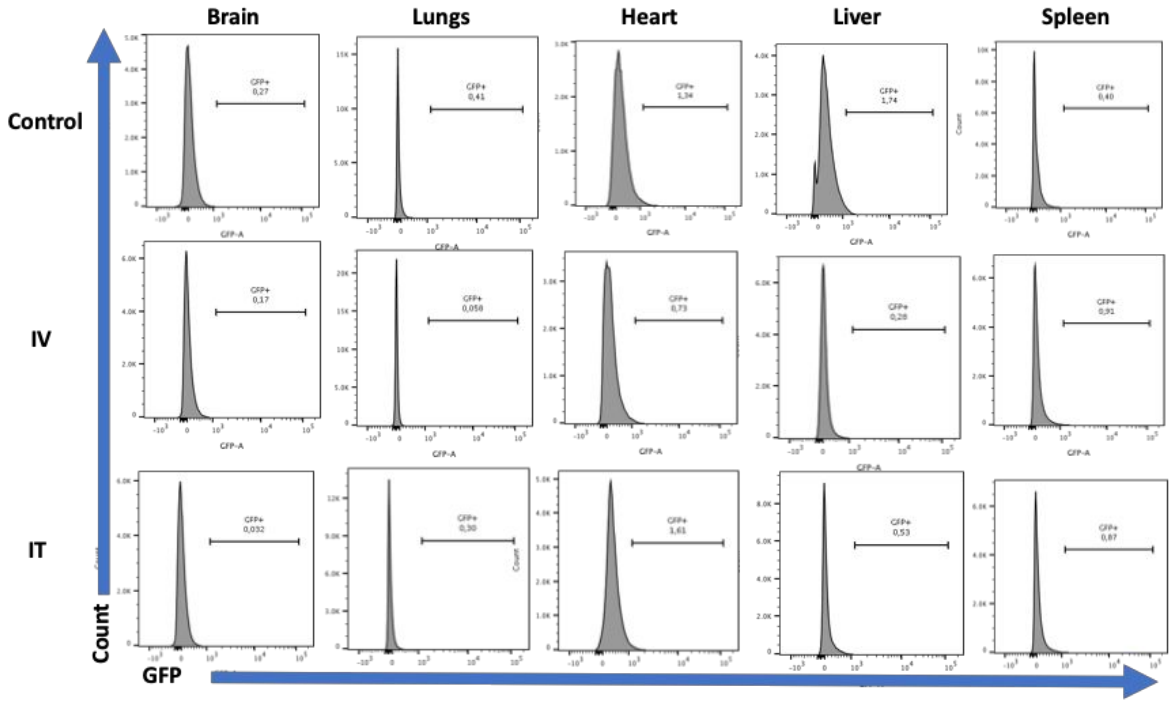

Figure S7: Representative flow cytometric histograms of GFP expression in different organs 48 hours post administration of EGFP-mRNA-NPs or control empty-NPs. The analyses exclude dead cells, identified by 7-AAD staining. Data represent means ± SEM, n=3 mice/group for i.t. injections, n=4 mice/group for i.v. injections.

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