

Supporting Information

Lipoic acid-modified oligoethyleneimine-mediated miR-34a delivery to
achieve the anti-tumor efficacy

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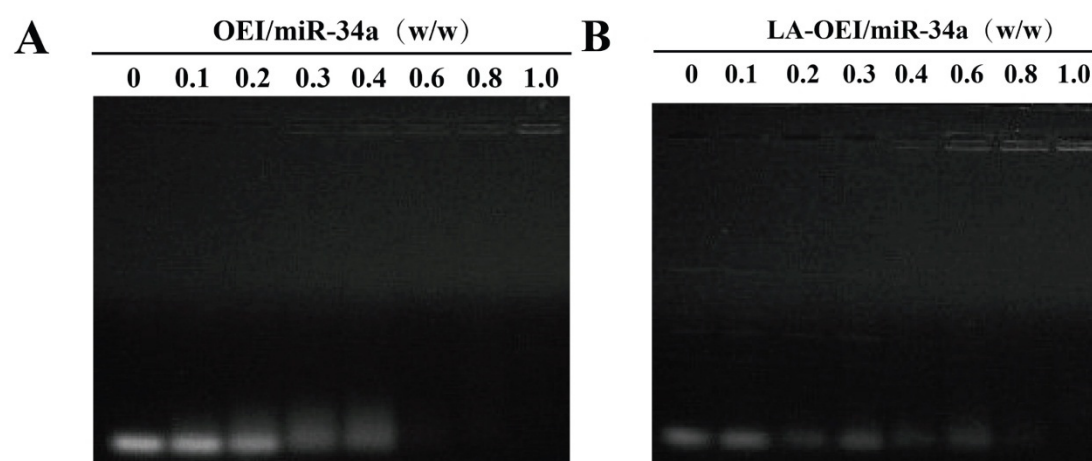


Figure S1. The miR-34a binding and condensation ability of different carriers using the gel retardation assay. A: OEI/miR-34a nanoparticles; B: LA-OEI/miR-34a nanoparticles.

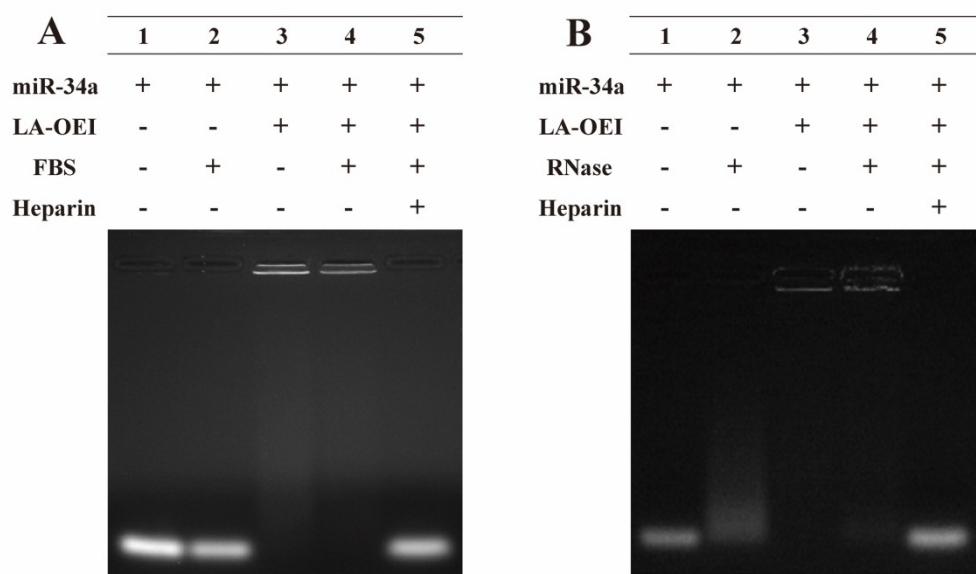


Figure S2. The protective effect of LA-OEI from the degradation of miR-34a. A: 50% FBS; B: RNase A.

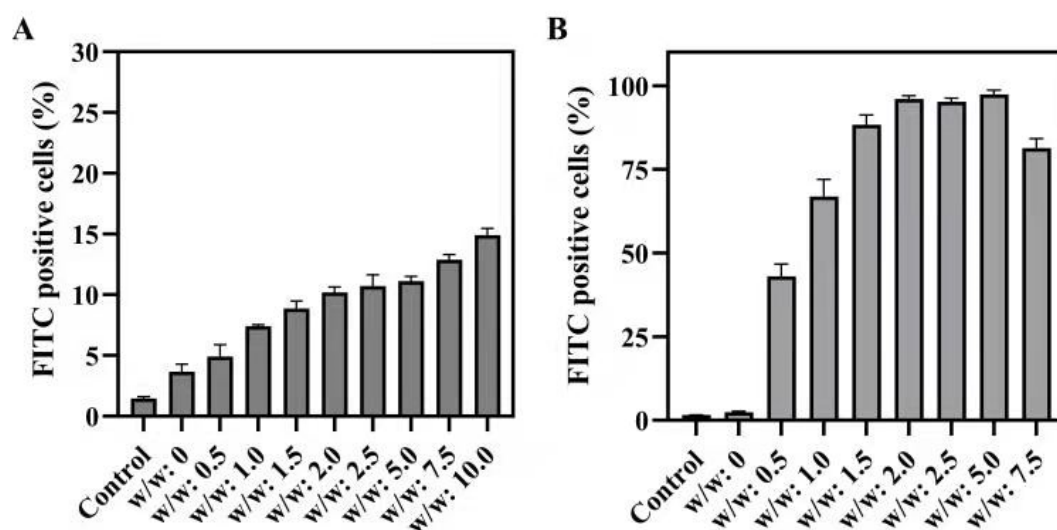


Figure S3. Quantitative analysis for the transfection efficiency of nanoparticles at different mass ratios based on FITC positive cells. A: OEI/miR-34a; B: LA-OEI/miR-34a. Data were presented as the mean value \pm SD of triplicate experiments.

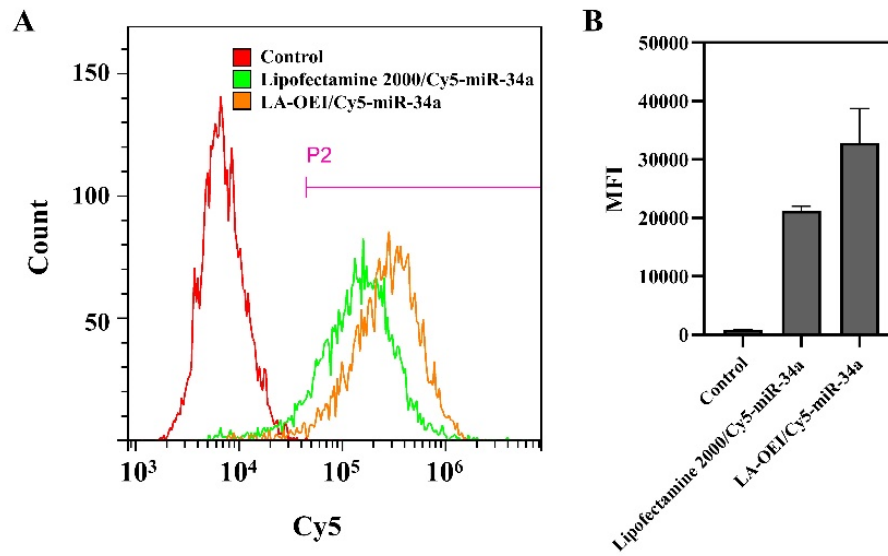


Figure S4. Flow cytometric analysis for the transfection efficiency of Lipofectamine 2000/miR-34a and LA-OEI/miR-34a nanoparticles (w/w: 0.5) using Cy5-labeled miR-34a (A) and the quantitative measurement based on mean fluorescence intensity (MFI) (B). Data were presented as the mean value \pm SD of triplicate experiments.

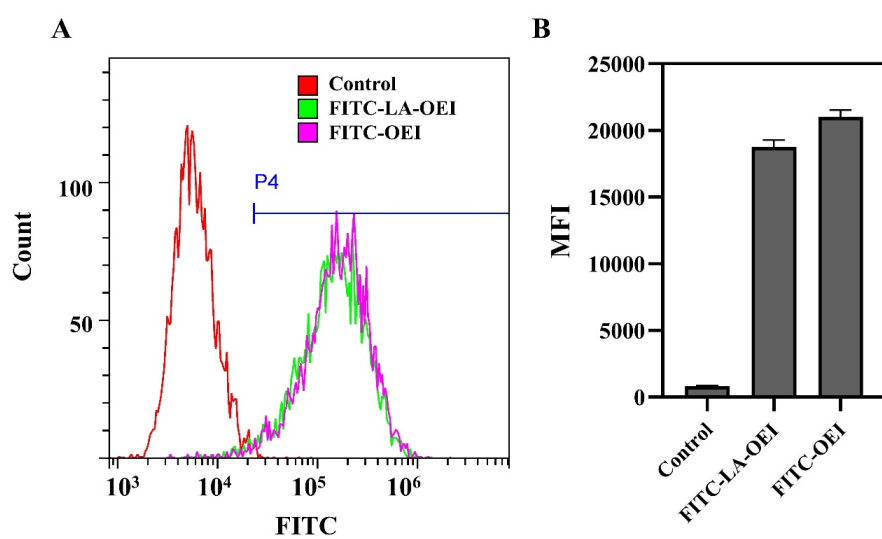


Figure S5. Flow cytometric analysis for the endocytosis ability of FITC-labeled OEI and LA-OEI (A) and the quantitative measurement based on mean fluorescence intensity (MFI) (B). Data were presented as the mean value \pm SD of triplicate experiments.

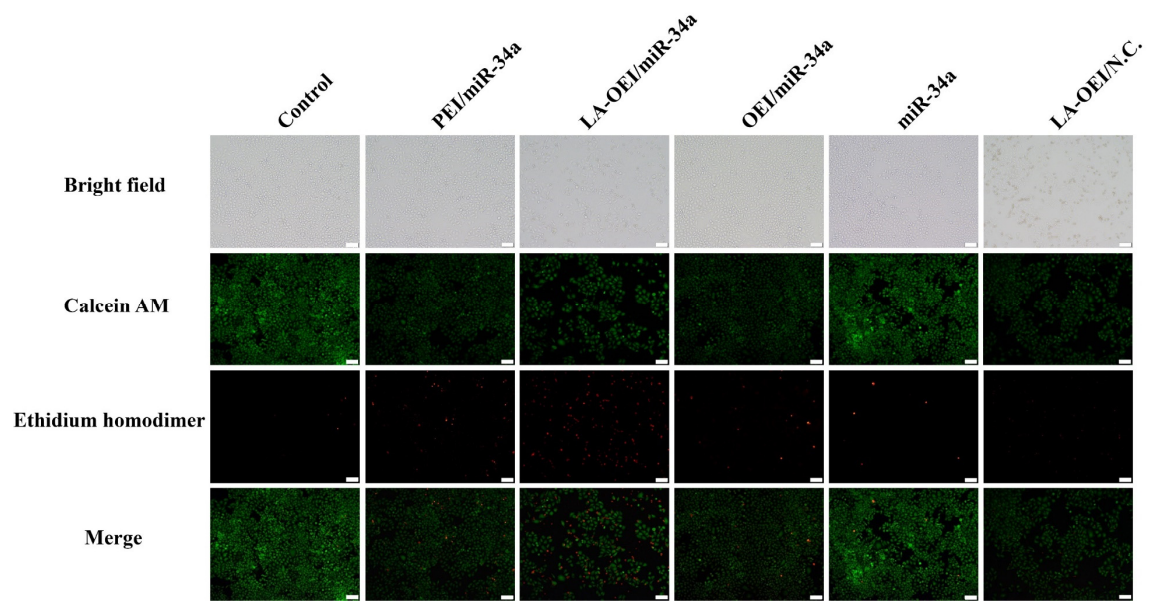


Figure S6. Live/dead staining assay of HeLa cells after the treatment with different nanoparticles. The scale bar is 100 μ m.

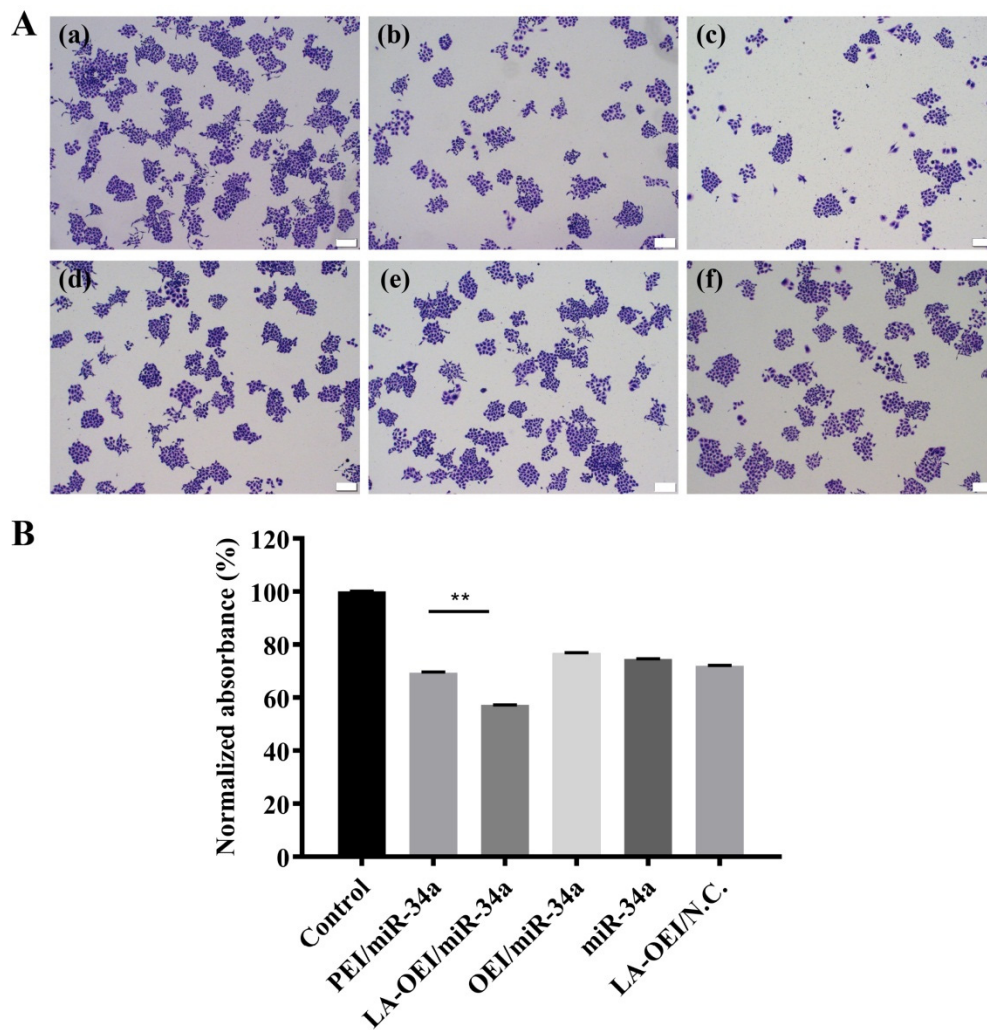


Figure S7. The anti-proliferative effect after the miR-34a transfection. A: The colony formation assay of HeLa cells after the treatment with different nanoparticles: (a) control, (b) PEI/miR-34a, (c) LA-OEI/miR-34a, (d) OEI/miR-34a, (e) miR-34a and (f) LA-OEI/N.C. The scale bar is 200 μ m. B: Quantitative analysis of the colony formation in HeLa cells after the treatment with different nanoparticles. Data were presented as the mean value \pm SD of triplicate experiments.

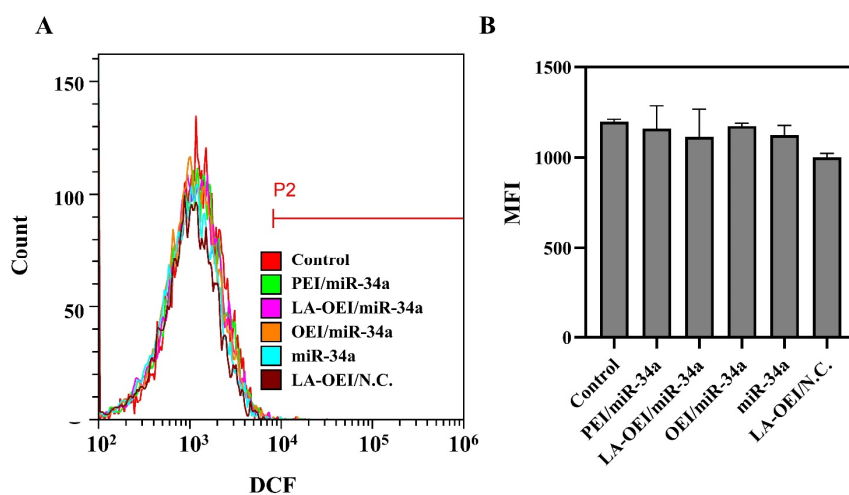


Figure S8. Flow cytometric analysis for the intracellular ROS level after the transfection of different nanoparticles for 48 h, using DCFH-DA as a probe (A) and the quantitative measurement based on mean fluorescence intensity (MFI) (B). Data were presented as the mean value \pm SD of triplicate experiments.

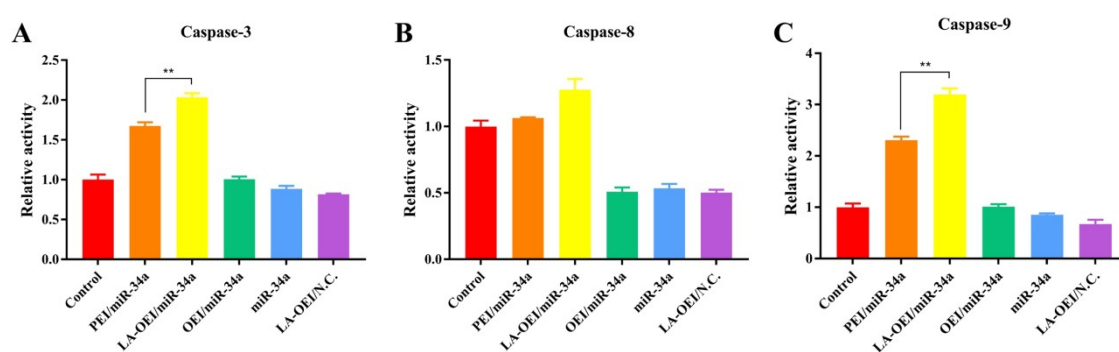


Figure S9. The relative activities of caspase-3, -8 and -9 in HeLa cells after the treatment with different nanoparticles. Data were presented as the mean value \pm SD of triplicate experiments.

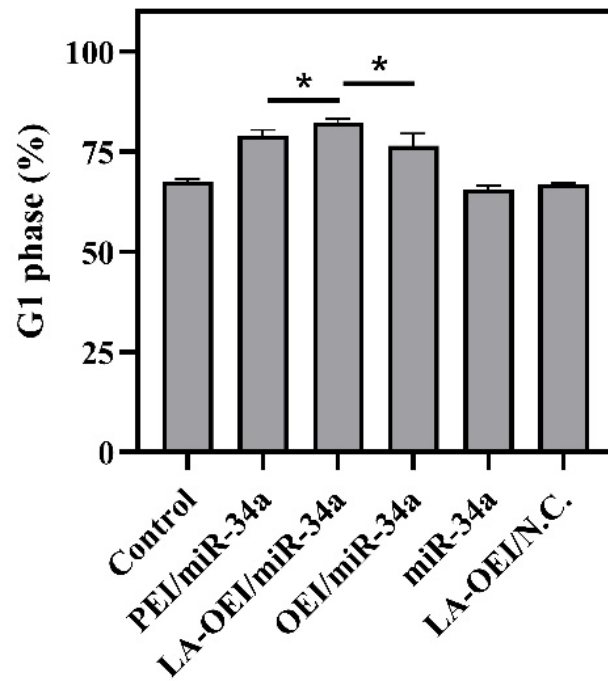


Figure S10. Quantitative analysis for the G1 phase arrest of HeLa cells after miR-34a transfection. Data were presented as the mean value \pm SD of triplicate experiments (* $p < 0.05$).

Table S1. The hydrodynamic diameter and zeta potential values of LA-OEI/miR-34a and OEI/miR-34a nanoparticles.

Nanoparticles	Mass ratio	Hydrodynamic diameter	Polydispersity	Zeta potential
		(nm)	index (PDI)	(mV)
LA-OEI/miR-34a	0.5	293.2 ± 2.6	0.318	-12.0 ± 0.8
	1.0	288.9 ± 3.6	0.373	+10.5 ± 1.2
	2.0	197.7 ± 4.4	0.362	+17.1 ± 0.9
	3.0	187.8 ± 1.2	0.316	+25.8 ± 0.6
	4.0	138.7 ± 0.9	0.234	+30.2 ± 0.9
	5.0	123.4 ± 2.1	0.276	+47.0 ± 0.7
OEI/miR-34a	0.5	386.9 ± 8.8	0.386	-15.0 ± 0.3
	1.0	280.0 ± 7.8	0.244	-0.1 ± 0.8
	2.0	218.5 ± 6.3	0.113	+5.3 ± 0.4
	3.0	190.2 ± 2.3	0.199	+8.2 ± 0.7
	4.0	181.9 ± 1.9	0.127	+13.6 ± 0.5
	5.0	167.0 ± 2.0	0.131	+17.5 ± 0.7