

## Supporting Information

### Inhibition of proliferation and migration of tumor cells through lipoic acid-modified oligoethylenimine-mediated p53 gene delivery

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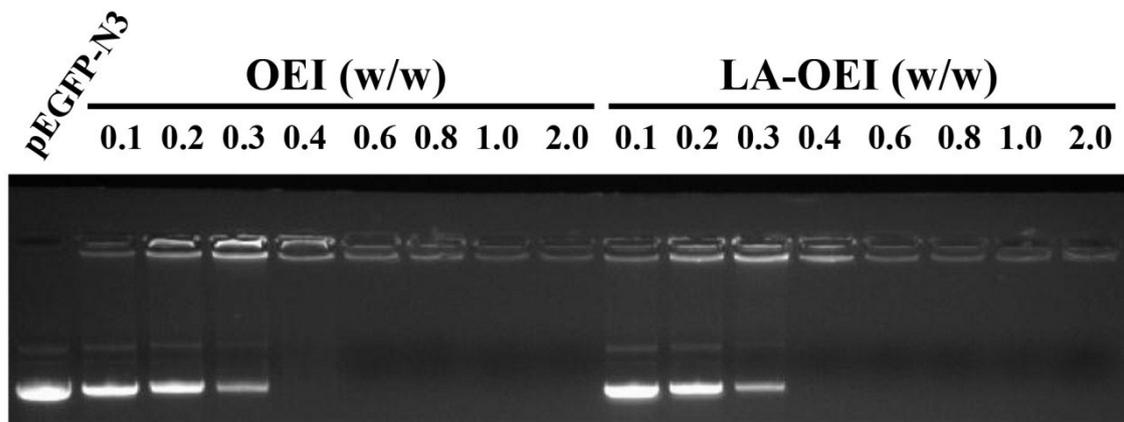
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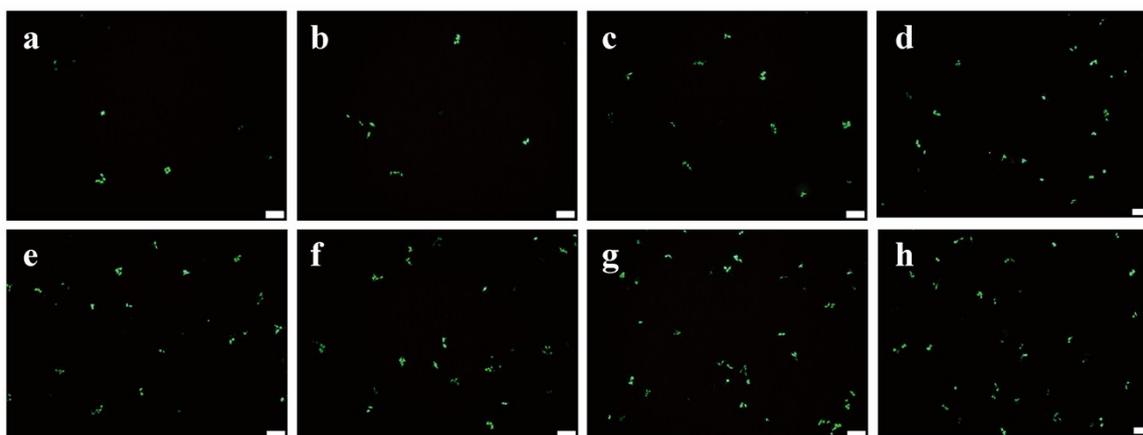
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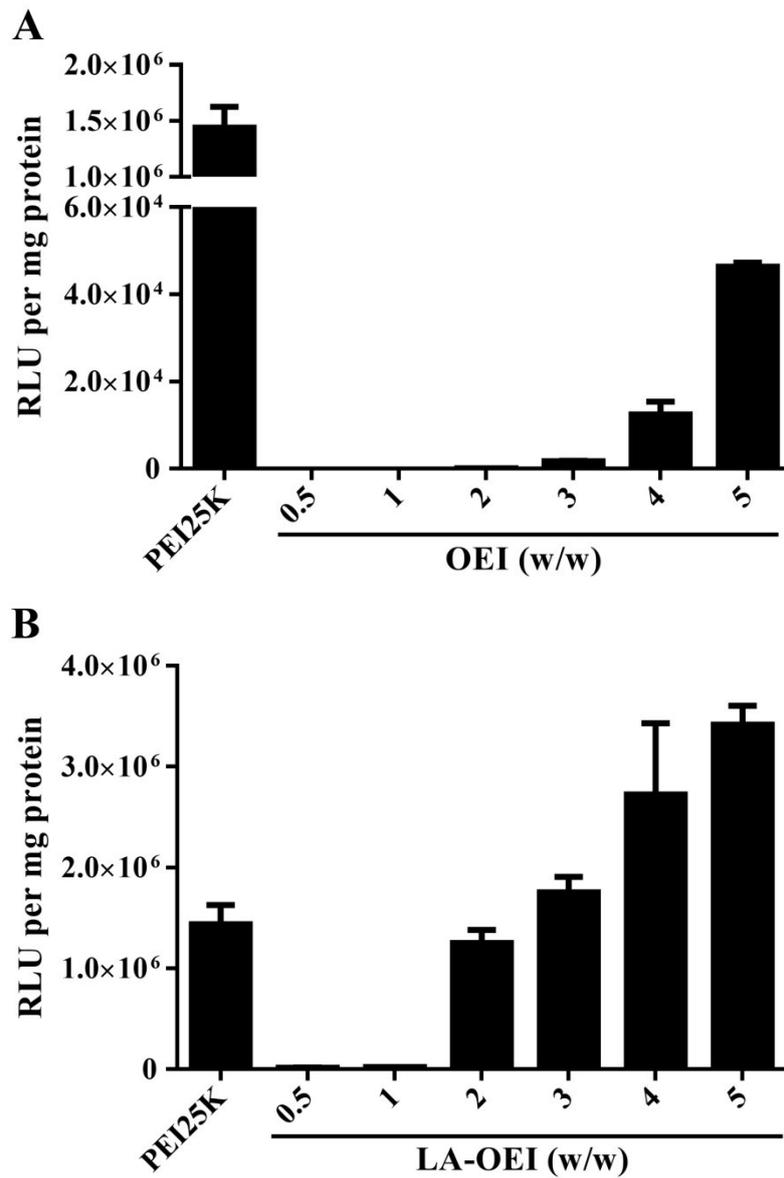
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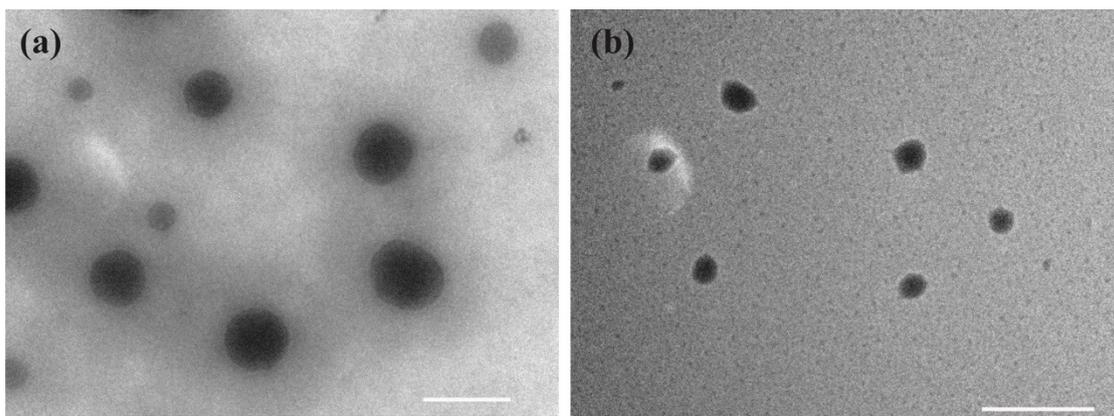
**Figure S1.** Gel retardation assay of OEI1800 and LA-OEI with plasmid pEGFP-N3 at different mass ratios.



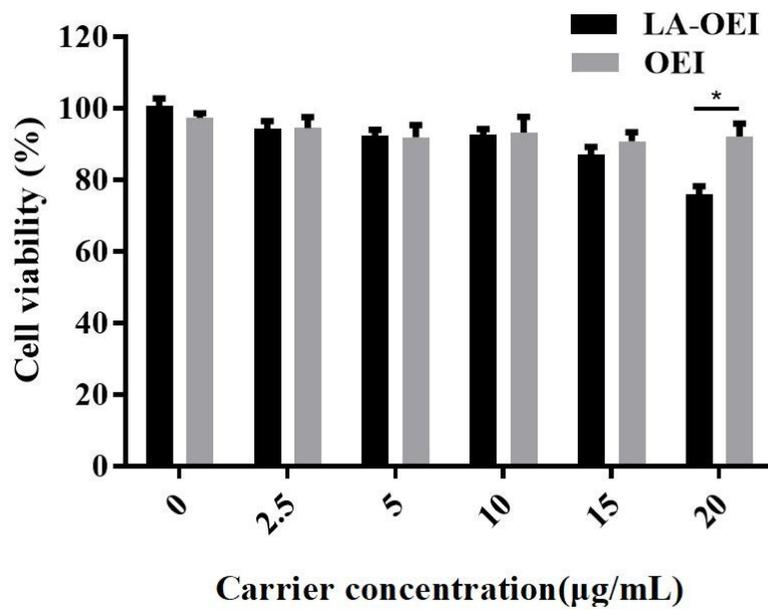
**Figure S2.** The transfection of HeLa cells with the plasmid pEGFP-N3 using OEI as the carrier at mass ratios of 7.5, 10.0, 15.0, 20.0, 25.0, 30.0, 40.0 and 50.0, respectively (a-h). The scale bar is 200  $\mu\text{m}$ .



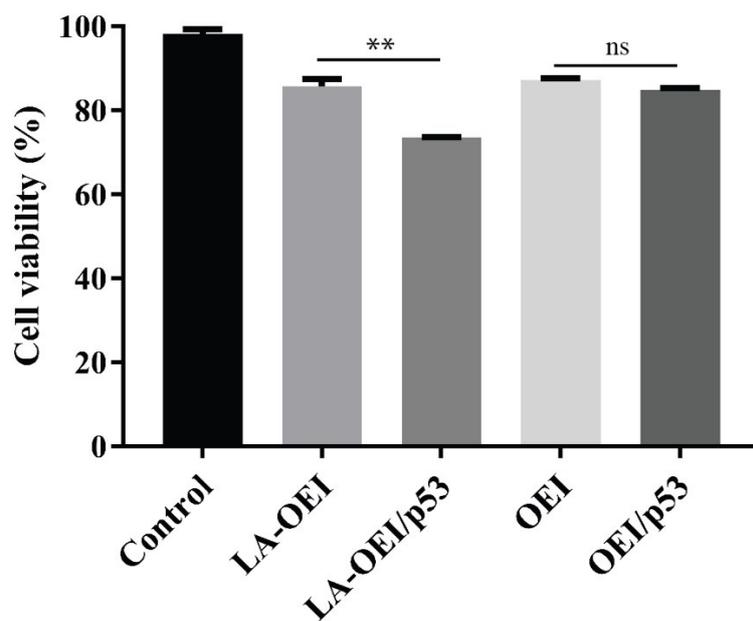
**Figure S3.** *In vitro* transfection efficiency analysis of OEI1800 (A) and LA-OEI (B) at different mass ratios, using the transfection of pGL-3 plasmid as a model. The data were presented as mean value  $\pm$  SD of three experiments.



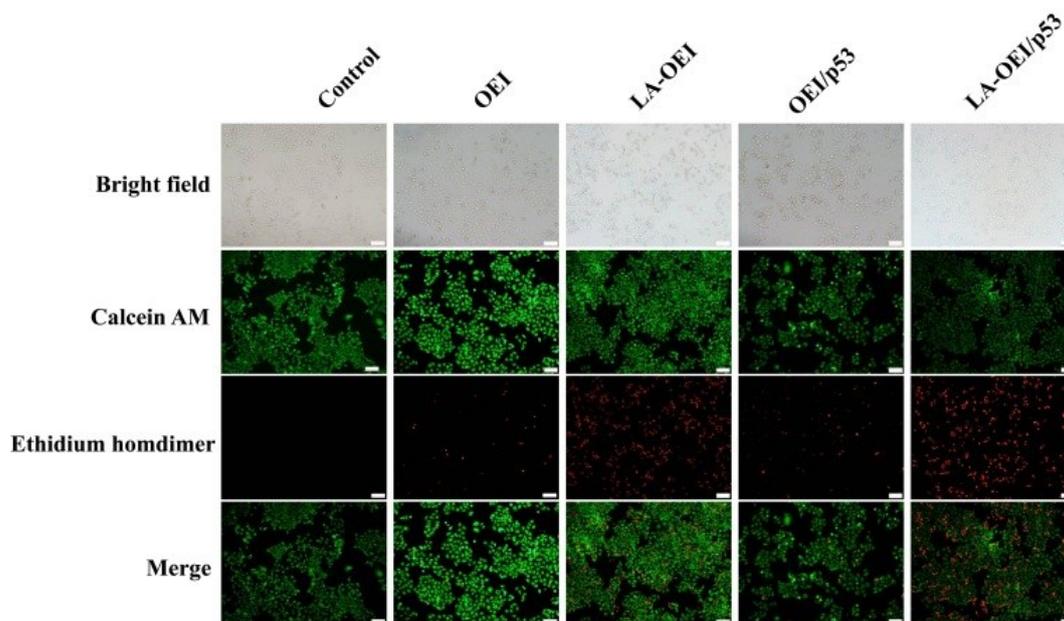
**Figure S4.** TEM images of OEI/pEGFP-N3 (a) and LA-OEI/pEGFP-N3 (b) nanocomplexes at a mass ratio of 4.0. The scale bar is 500 nm.



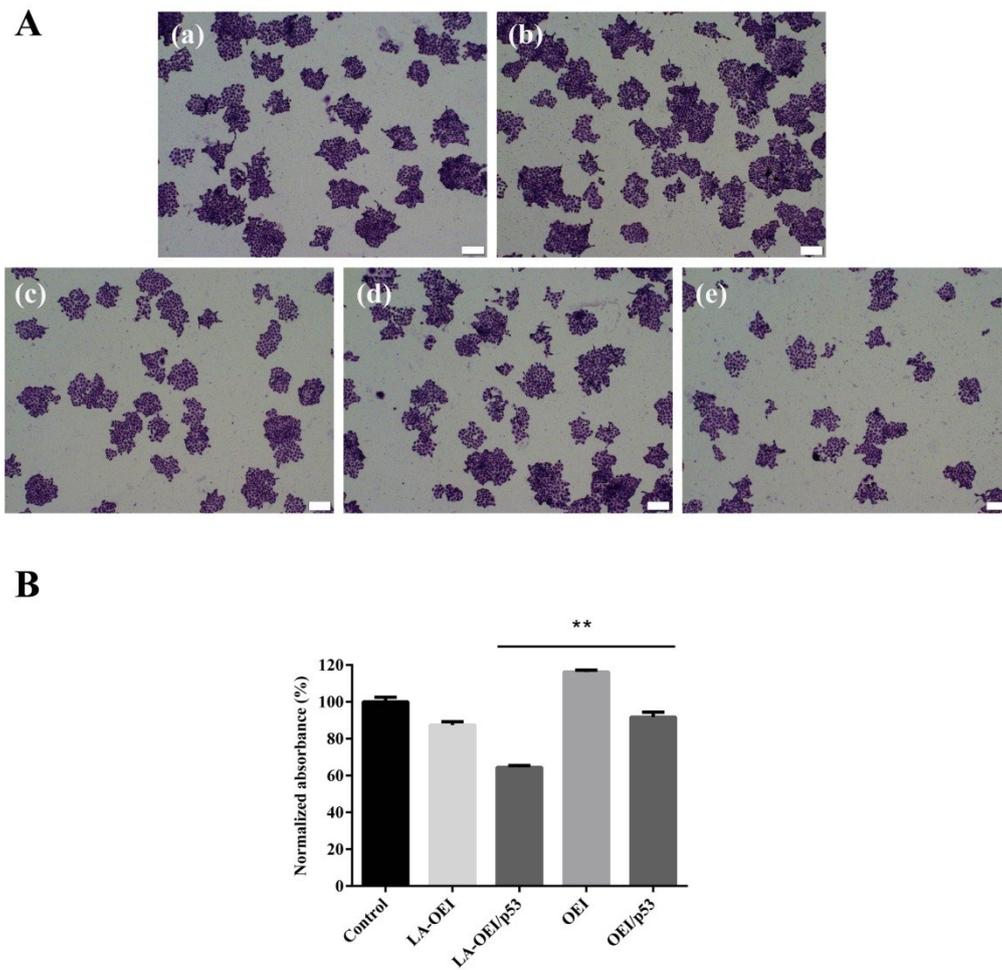
**Figure S5.** Cell viability analysis of the carriers LA-OEI and OEI1800 at different concentrations through MTT method. The data were presented as mean value  $\pm$  SD of three experiments (ns, not significant; \* $p$ <0.05; \*\* $p$ <0.01).



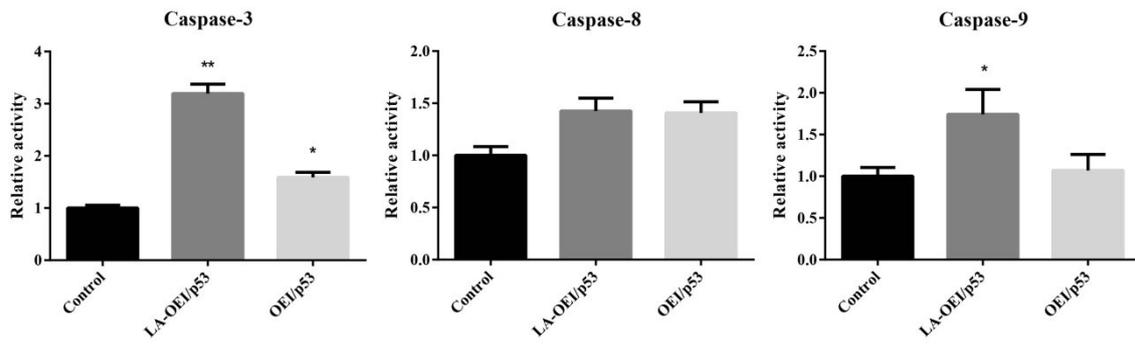
**Figure S6.** Induction of anti-proliferative effect by the carriers-mediated p53 transfection in PC-3 cells through MTT method. The data were presented as mean value  $\pm$  SD of three experiments (ns, not significant; \* $p$ <0.05; \*\* $p$ <0.01).



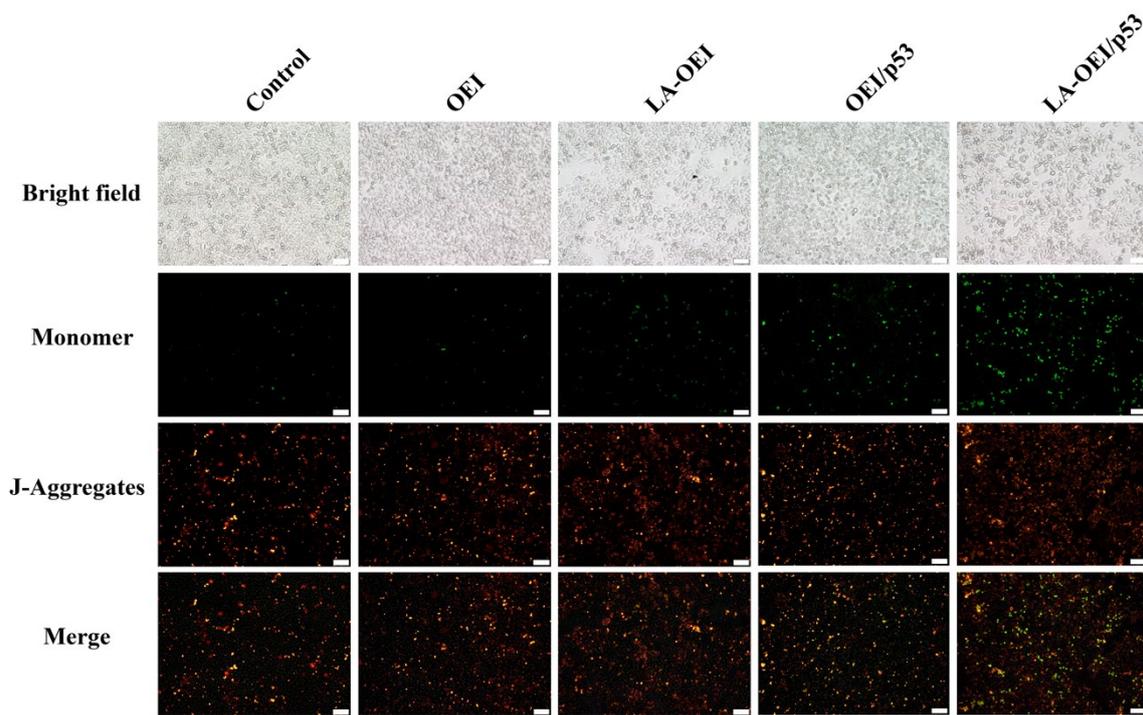
**Figure S7.** Live/Dead staining of HeLa cells after p53 transfection mediated by different carriers, in which living and dead cells were stained to green and red, respectively. The scale bar is 100  $\mu$ m.



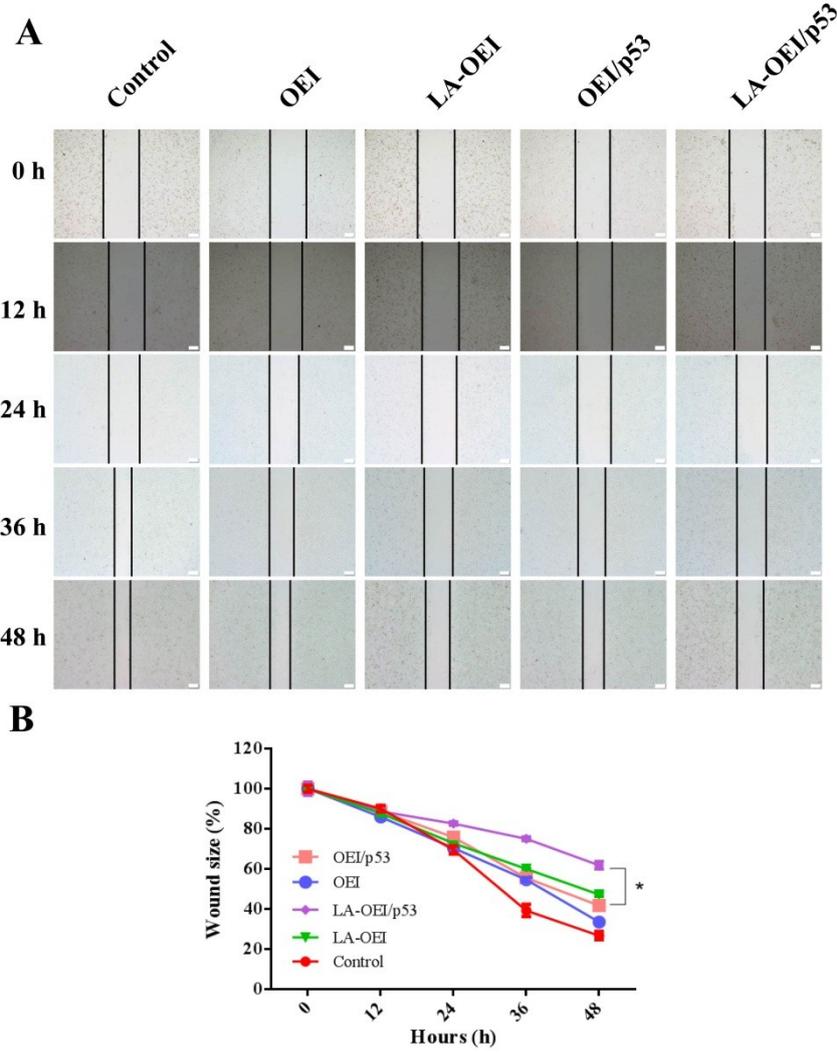
**Figure S8.** Inhibition of colony formation after p53 transfection mediated by different carriers (A) and the quantitative analysis (B): (a) control; (b) OEI1800; (c) LA-OEI; (d) OEI/p53; and (e) LA-OEI/p53. The scale bar is 200  $\mu\text{m}$ .



**Figure S9.** The activity analysis of caspase-3, -8 and -9 after p53 delivery mediated by different carriers.



**Figure S10.** Mitochondrial membrane potential analysis of HeLa cells after p53 transfection mediated by different carriers, using JC-1 probe. The scale bar is 100  $\mu$ m.



**Figure S11.** Wound healing assay for the anti-migration effect induced by the carriers-mediated p53 transfection. The scale bar is 200  $\mu$ m, and data were presented as mean value  $\pm$  SD of three experiments.

**Table S1.** Hydrodynamic diameter and zeta potential of LA-OEI/pEGFP-N3 and OEI/pEGFP-N3 nanocomplexes at different mass ratios. Data were presented as mean value  $\pm$  SD of three experiments.

<b>Entry</b>	<b>Mass ratio</b>	<b>Hydrodynamic diameter (nm)</b>	<b>Polydispersity index</b>	<b>Zeta potential (mV)</b>
LA-OEI/pEGFP-N3	1.0	274.3 $\pm$ 4.6	0.301	+12.3 $\pm$ 1.0
	2.0	221.8 $\pm$ 4.3	0.290	+17.9 $\pm$ 1.2
	3.0	155.6 $\pm$ 1.0	0.244	+26.8 $\pm$ 0.5
	4.0	105.5 $\pm$ 0.9	0.152	+30.5 $\pm$ 0.3
	5.0	91.8 $\pm$ 2.6	0.144	+33.7 $\pm$ 0.7
OEI/pEGFP-N3	1.0	389.5 $\pm$ 8.7	0.294	+6.1 $\pm$ 0.2
	2.0	332.2 $\pm$ 5.6	0.266	+6.5 $\pm$ 0.2
	3.0	299.2 $\pm$ 1.8	0.272	+18.3 $\pm$ 0.3
	4.0	186.8 $\pm$ 0.4	0.195	+25.5 $\pm$ 0.5
	5.0	129.6 $\pm$ 0.7	0.155	+28.0 $\pm$ 0.5