Supplementary file

Combining photothermal therapy and immunotherapy against melanoma by polydopamine-coated Al_2O_3 nanoparticles

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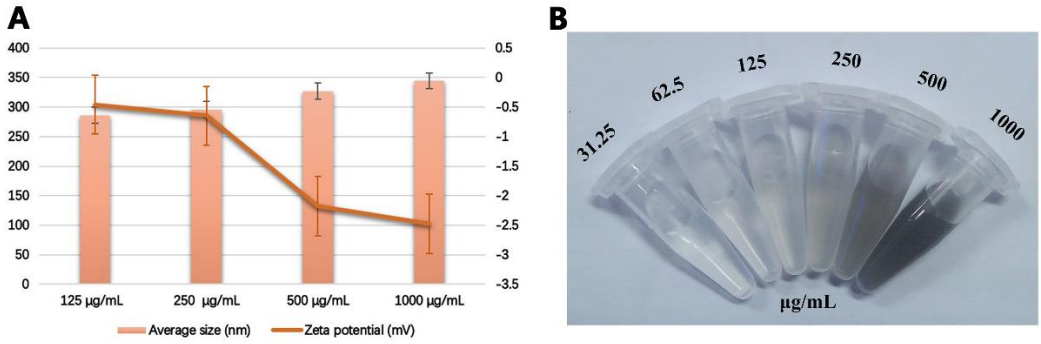

C

	Average size (nm)	PDI	Zeta potential (mV)
Before irradiation	344.4 ± 5.5	0.165 ± 0.011	-2.48 ± 0.18
After irradiation	340.9 ± 4.7	0.151 ± 0.013	-2.77 ± 0.13

Figure S1. Characterization of pD-Al_2O_3 nanoparticles. (A) Average sizes and zeta potentials of pD-Al_2O_3 nanoparticles at various concentrations. (B) Photograph of pD-Al_2O_3 nanoparticles synthesized with the indicated concentrations of dopamine. (C) Average sizes, PDI and zeta potentials of pD-Al_2O_3 nanoparticles at 1,000 μg/mL before or after irradiation at 1.18 W/cm^2 for 300 s.

A

	Al_2O_3 nanoparticles		pD-Al_2O_3 nanoparticles	
Chemical element	Weight percent %	Atomic percent %	Weight percent %	Atomic percent %
Al	52.44	37.92	23.87	13.68
O	37.47	45.70	36.09	34.87
C	10.09	16.38	39.53	50.88
N	-	-	0.52	0.57

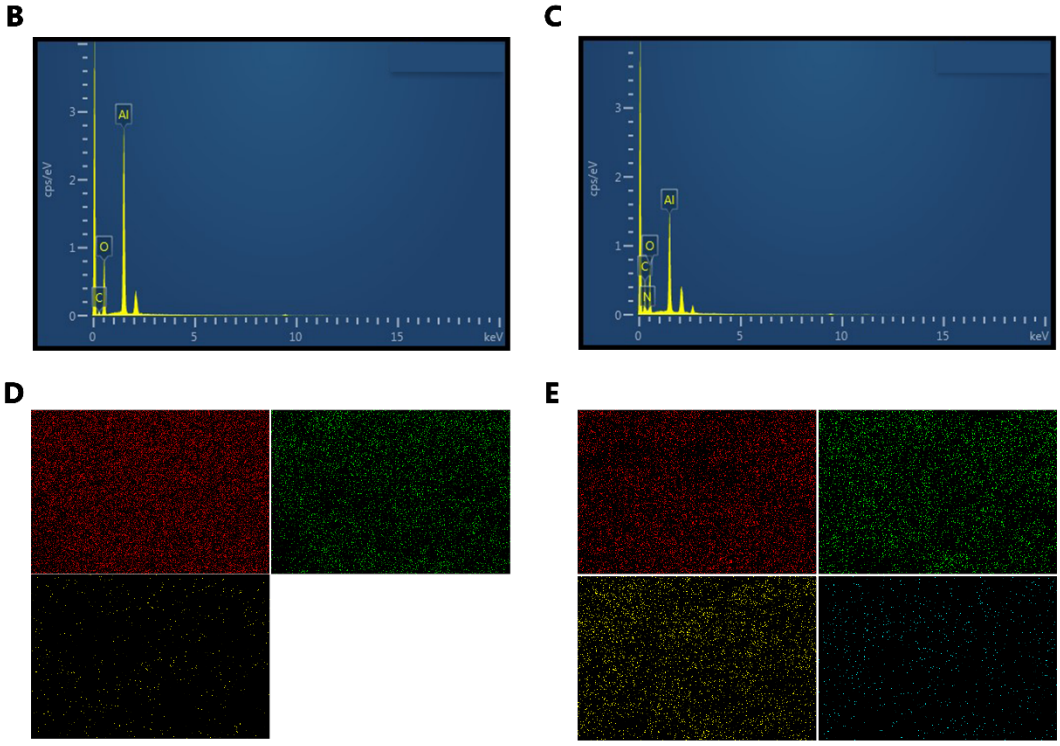

Figure S2. Interactions between Al_2O_3 nanoparticles and polydopamine. (A) We analyzed the weight percent and atomic percent (%) of four chemical elements (Al, O, C, N) in our Al_2O_3 and pD-Al_2O_3 nanoparticles by EDX mapping. Spectrogram for Al, O, C and N in Al_2O_3 (B) and pD-Al_2O_3 (C) nanoparticles. Element mapping for Al (red), O (green), C (yellow) and N (blue) in Al_2O_3 (D) and pD-Al_2O_3 (E) nanoparticles.

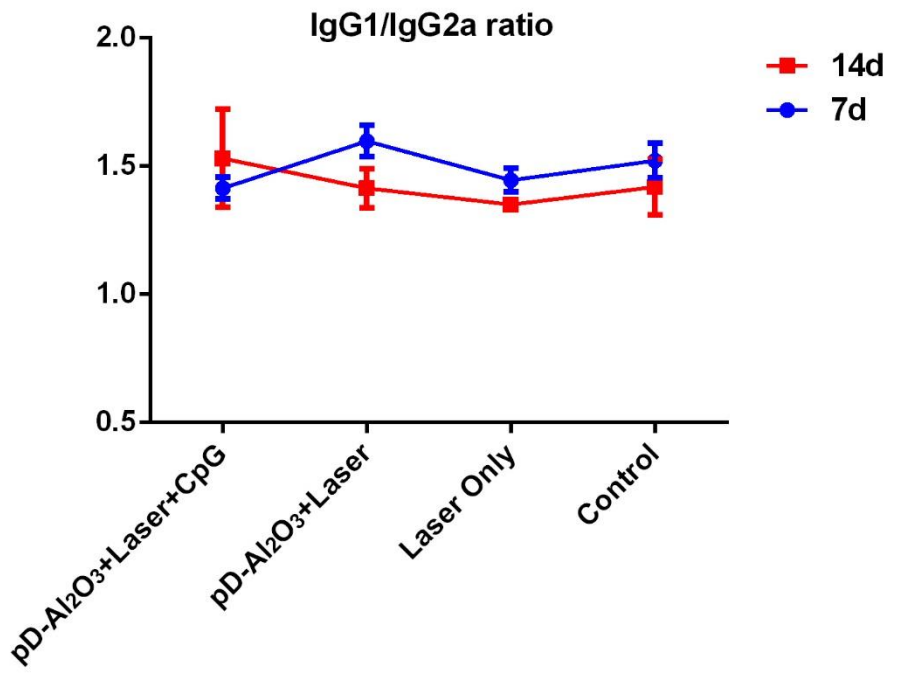

Figure S3. The ratio of IgG1/IgG2a *in vivo*. We calculated the IgG1/IgG2a ratio as an indicator of Th1/Th2 immune responses.

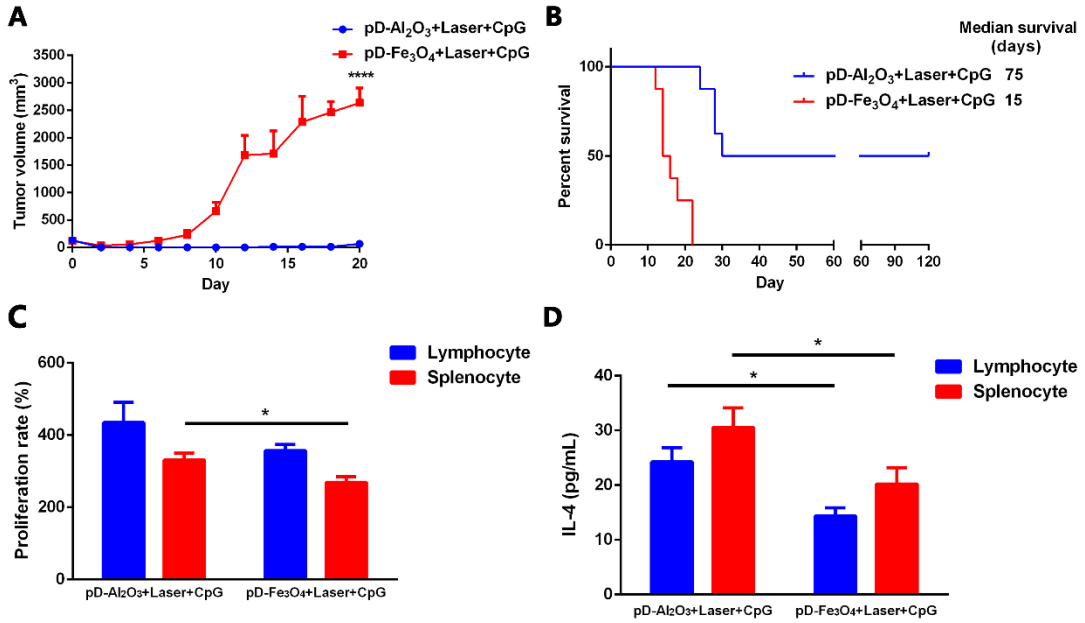

Figure S4. Comparison of anti-tumor effects and immune responses induced by pD-Al_2O_3 or pD-Fe_3O_4 nanoparticles *in vivo*. Animals were exposed to the combination therapy of PTT followed by immunotherapy in the presence of CpG. (A) Tumor growth (8 mice per group). (B) Survival of mice (8 mice per group). (C) Proliferation rates of lymphocytes and splenocytes from mice treated as indicated. (D) Levels of IL-4 in the supernatants of cultures of lymphocytes and splenocytes cultures, based on ELISA.

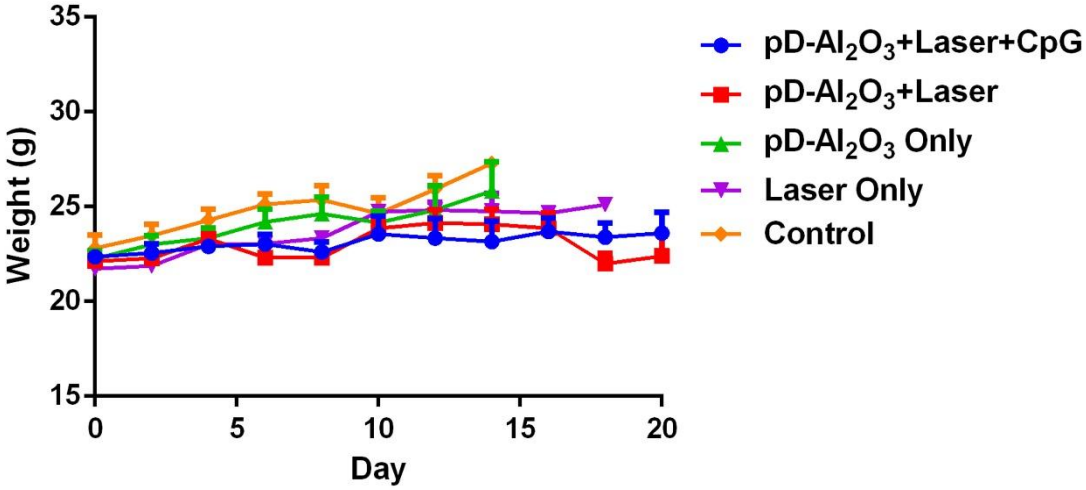

Figure S5. Toxicity of pD-Al_2O_3 nanoparticles *in vivo*. Mouse body weight was measured after the indicated treatments (8 mice per group).