## **Supporting Information**

## Safe and Efficacious Diphtheria Toxin-Based Treatment for Melanoma: Combination of Light-On Gene-Expression System and Nanotechnology

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Figure S1. Sequence information for pEGFP.



Figure S2. Sequence information for pGAVPO (pG).



Figure S3. Sequence information for pU5-mCherry (pCherry).



Figure S4. Sequence information for pU5-DTA (pDTA).



Figure S5. Synthetic route of DOPE-PEG<sub>2000</sub>-cRGD.



Varied Intensity of Blue Light Exposure

**Uniform Intensity of Blue Light Exposure** 



Figure S6. LED arrays and laser devices used for light-switchable transgene expression. Timer-controlled LED arrays for monolayer cultures are shown.



Figure S7. LED arrays and laser devices used for light-switchable transgene expression. Timer-controlled LED arrays for mice are shown.



Figure S8. Confirmation of MAL-PEG<sub>2000</sub>-NHS, DOPE-PEG<sub>2000</sub>-MAL and DOPE-PEG<sub>2000</sub>-cRGD using <sup>1</sup>H NMR.



Figure S9. Size distribution, zeta potential and TEM of blank cRGD-modified cationic liposomes.



**Figure S10.** Photograph showing hemolysis severity after treatment with cRGD-CL at different concentrations. Percentage hemolysis induced by cRGD-CL at different concentrations is also shown (n = 3).



**Figure S11.** Flow cytometry histograms of B16F10 cells after treated with coumarin-6 loaded cRGD-CL of various cRGD density (1 mol%, 5 mol% and 10 mol%) for 1.5 h and 4 h.



**Figure S12.** Flow cytometry analysis of EGFP expression in B16F10 cells after transfected with pEGFP loaded cRGD-CL of various cRGD coating density (1 mol%, 5 mol% and 10 mol%).



**Figure S13.** Flow cytometry analysis of mCherry expression in B16F10 cells after transfected with pG&pCherry@cRGD-CL under various blue irradiation intensities (0.3, 1.3 and 2 W/m<sup>2</sup>) and duration (10, 20 and 30 h).



**Figure S14.** Relative tumor volume of C57BL/6 mice bearing B16F10 cells after intravenous injection with pG&pDTA@cL and pG&pDTA@cRGD-CL without blue-light irradiation (n = 6).



Figure S15. Body weight of C57BL/6 mice bearing B16F10 cells treated with pG&pDTA@CL and pG&pDTA@cRGD-CL (i.v.) without blue-light irradiation (n = 6).