Electronic Supplementary Information (ESI)

For

Assembling Mn:ZnSe Quantum Dots-siRNA Nanoplex for Gene Silencing in Pancreatic Cancer Cells

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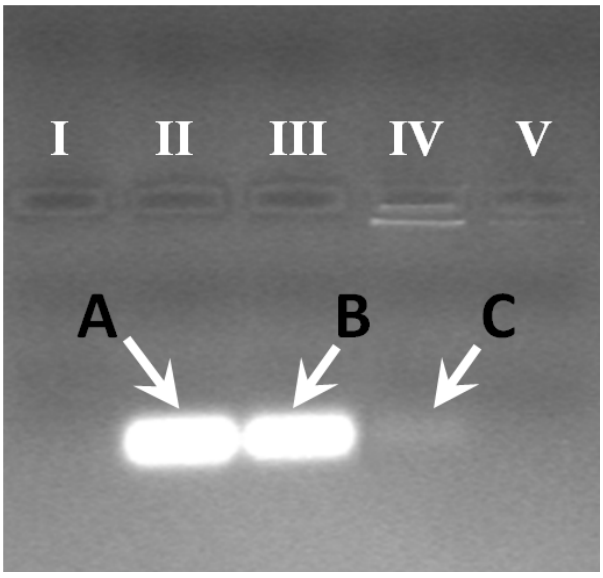

Figure. S1 Agarose gel electrophoresis examining the binding between d-dot/PAH clusters and siRNAs. (I) d-dot/$PAH_{0.1}$ (+31 mV) only, (II) free siRNA only, and siRNA mixed with (III) MPA stabilized d-dot (-17 mV), (IV) d-dot/$PAH_{0.05}$ (+24 mV) or (V) d-dot/$PAH_{0.1}$ (+31 mV). The bright band A, B and C correspond to free and unbound siRNA. Because of the electric field applied, the unbound negatively charged siRNA shifted to bottom (anode) and stained by fluorescent ethidium bromide in gel.

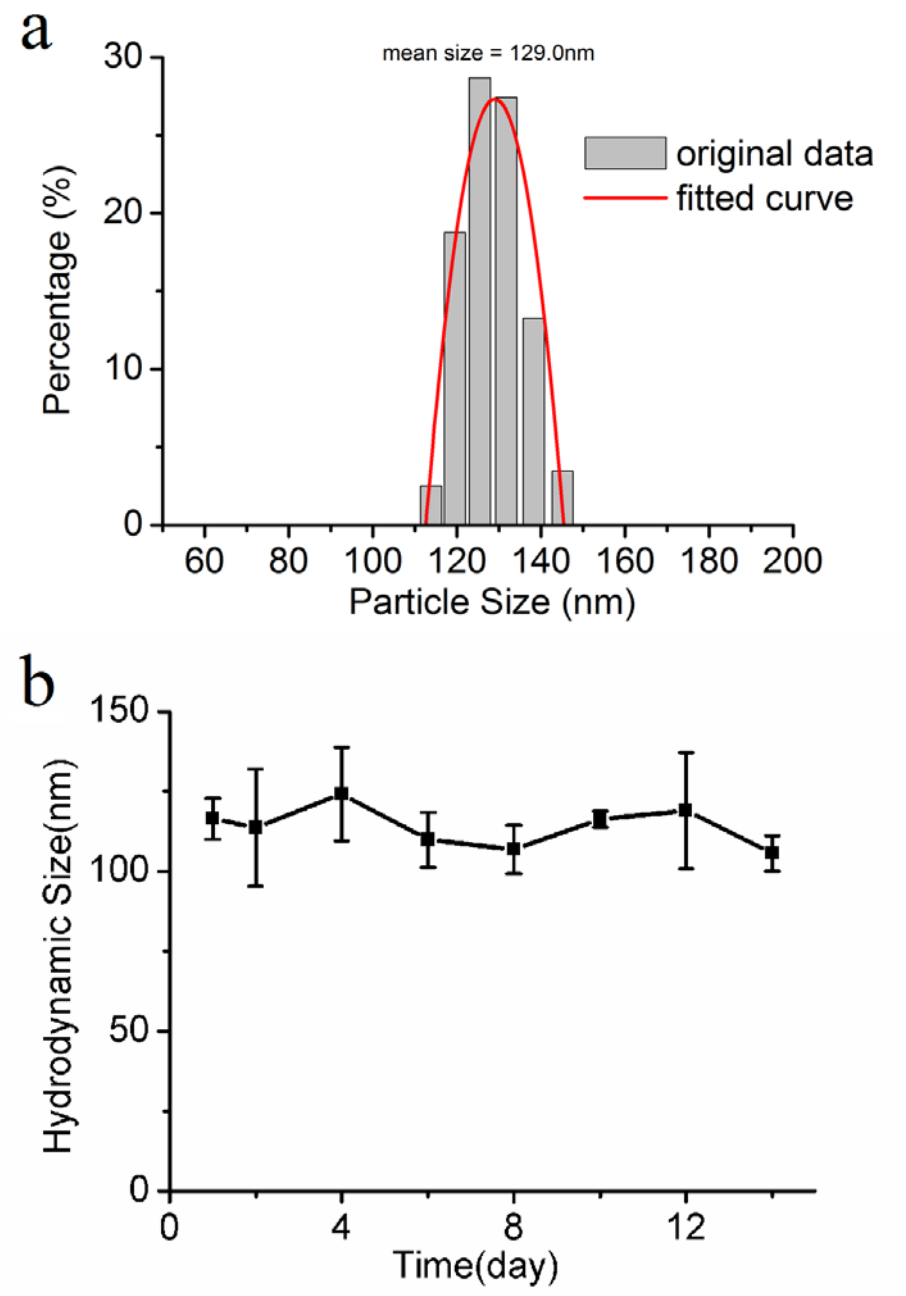

Figure. S2 (a) Hydrodynamic size distribution of d-dot/$PAH_{0.1}$/$siRNA^{FAM}$/PAH nanoplexes measured by DLS. (b) Colloidal stability of d-dot/$PAH_{0.1}$/$siRNA^{FAM}$/PAH nanoplexes dispersed in DEPC treated water at 25 ^{o}C. The hydrodynamic size of the complexes was monitored over a period of 2 weeks.

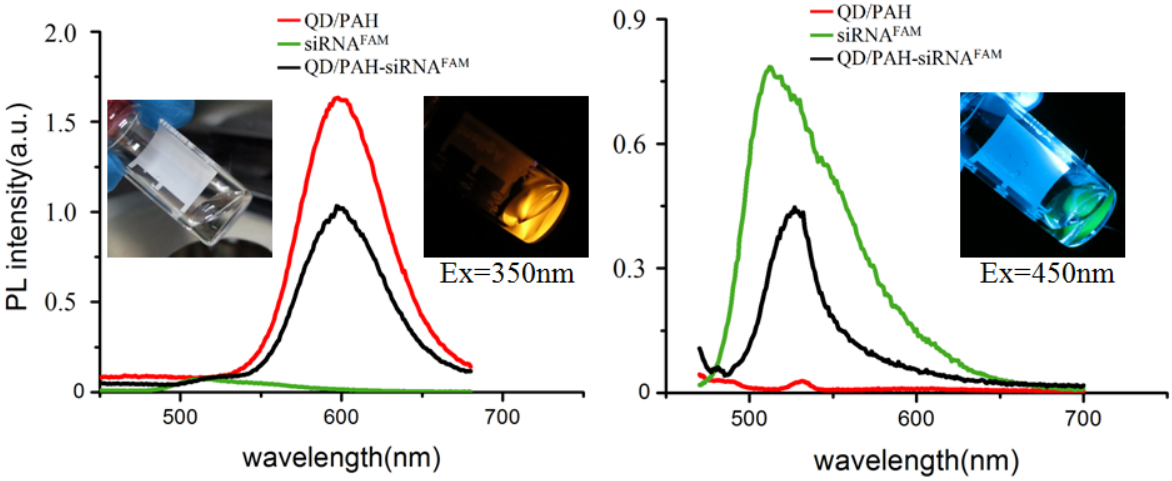

Figure. S3 Photoluminescence (PL) spectra of d-dot/PAH, free siRNA^{FAM} and d-dot/PAH/siRNA^{FAM} nanoplexes excited by UV (λ=350 nm) or blue (λ=450 nm) light sources. Real image of d-dot/PAH/siRNA^{FAM} under different excitations are shown in inset pictures.

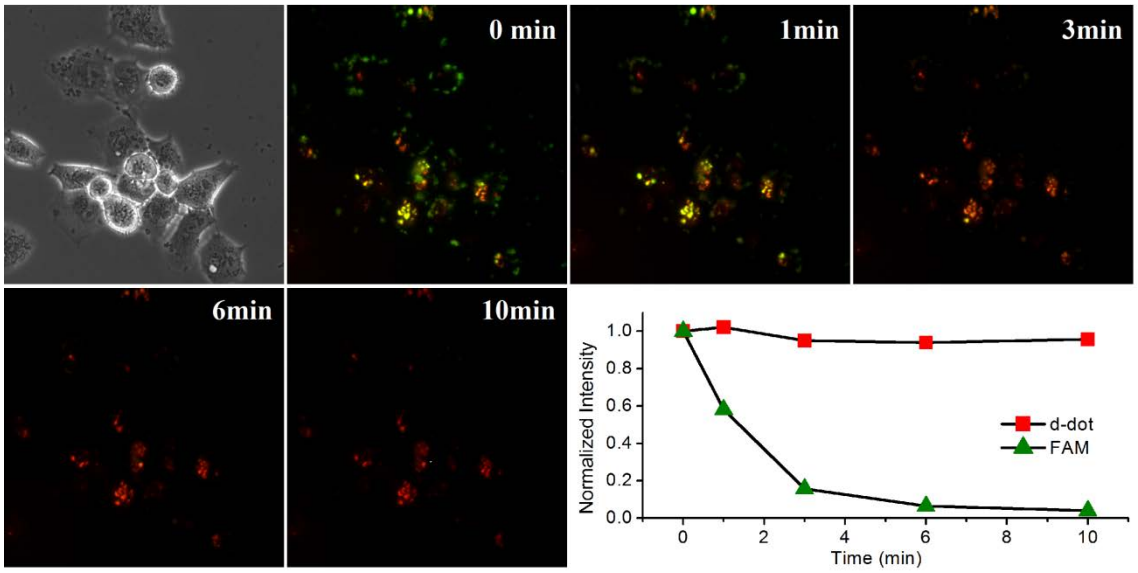

Figure. S4 Photostability comparison between d-dots and FAM fluorophores. Panc-1 cells transfected with d-dot/PAH-siRNAFAM under continuous irradiation by Mercury Light Source. Fluorescent images of the cells were taken at different time intervals. Evolution of the relative PL intensity of the d-dot and FAM signals were plotted. In comparison with FAM fluorophores, the d-dots are highly stable against photobleaching.

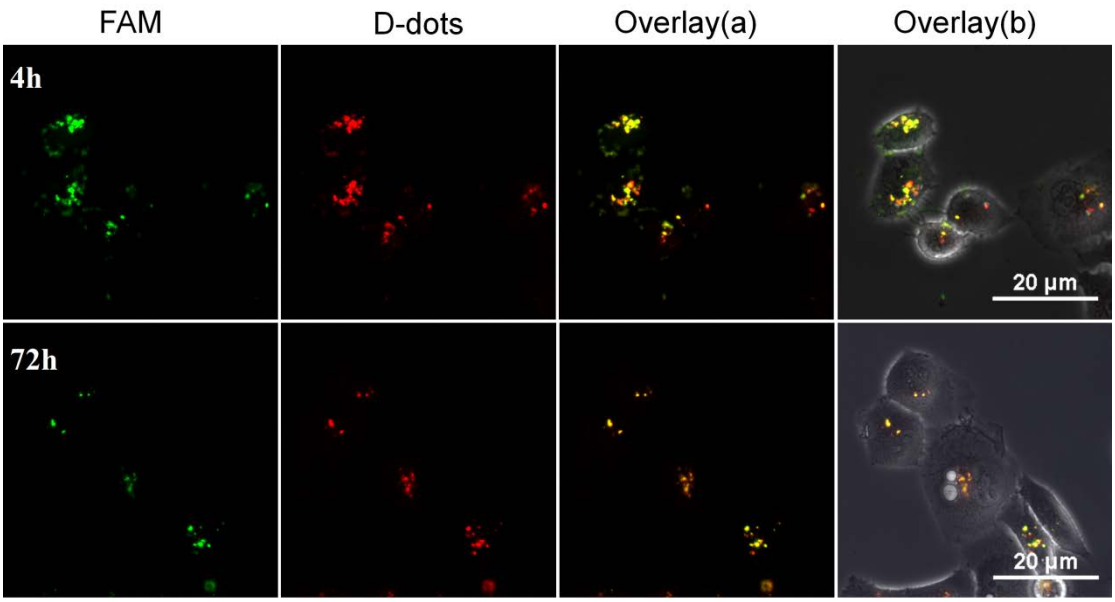

Figure. S5 Fluorescent images of Panc-1 cells treated with d-dot/PEI-siRNA^{FAM} for 4 hours. The images were taken at 4 and 72 hours post-transfection, respectively.

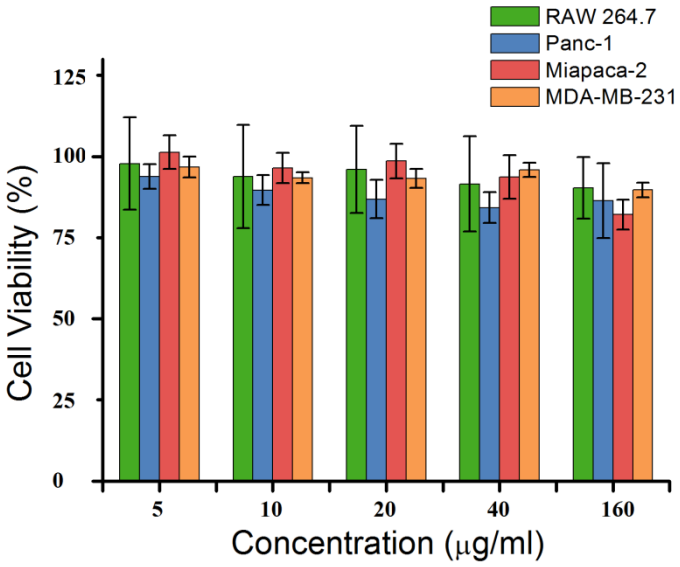

Figure. S6 Cytotoxicity tests of the d-dot/PAH nanoplex on four different cell lines, i.e. RAW 264.7, Panc-1, Miapaca-2 and MDA-MB-231. The cells were treated with different concentrations of d-dot/PAH for 48 hours.