Supporting Information

Functionalized MoS_2 Nanosheets as Multi-Gene Delivery Vehicles for *In Vivo* Pancreatic Cancer Therapy

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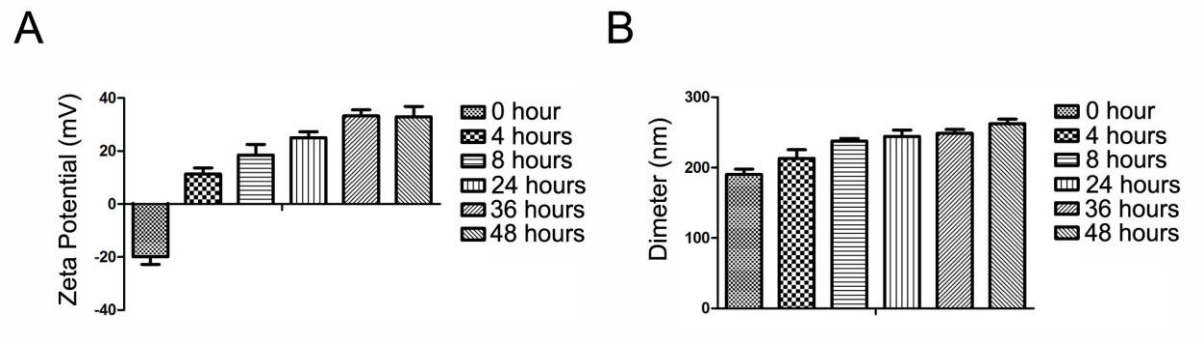

Figure S1: (A) Surface zeta potential and (B) hydrodynamic diameter of the complex of MoS_2/PEG/FA with PAH at different mixing time. All experiments are performed in duplicates with consistent results. Values are means ± SEM, n = 3.

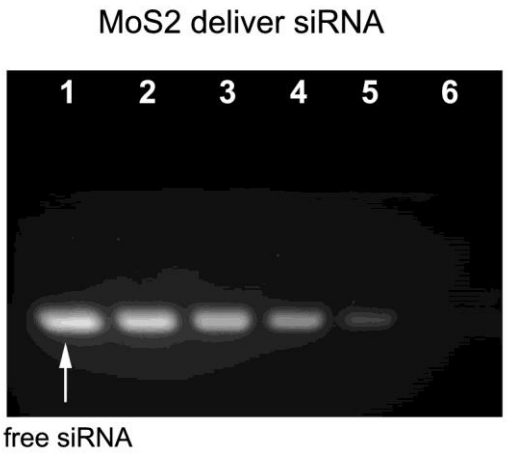

Figure S2: Gel retardation analysis of siRNA loading by MoS_2/PEG/FA /PAH, using free siRNA as reference (lane 1). The mass ratio between MoS_2/PEG/FA/PAH (1 mg/mL) and siRNA (130 μg/mL) are set to be 0.5:1.3 (lane 2), 1:1.3 (lane 3), 2:1.3 (lane 4), 4:1.3 (lane 5) and 6:1.3 (lane 6), respectively.

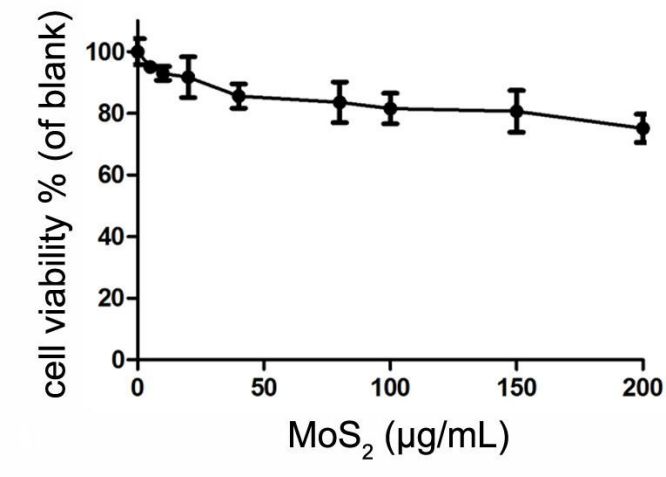

Figure S3: Cytotoxicity study of MoS_2/PEG/FA/PAH where Panc-1 cells are treated with different concentrations of MoS_2/PEG/FA/PAH for 72 hours.

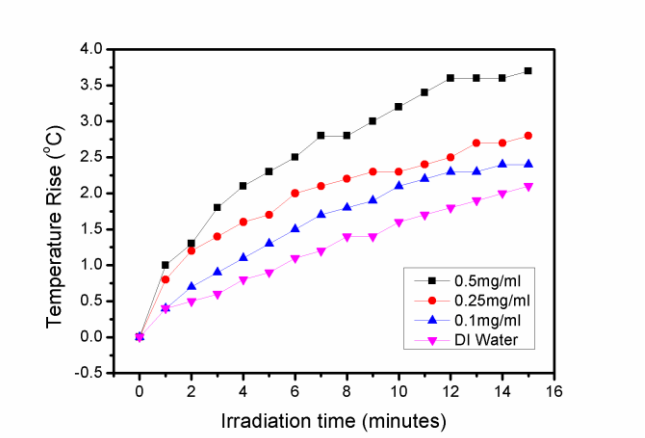

Figure S4: Temperature increase of MoS_2/PEG/FA under irradiation of 808nm laser for 15 minutes. The authors noted difference in temperature measurement compared to other publications due to difference in measurement protocol.

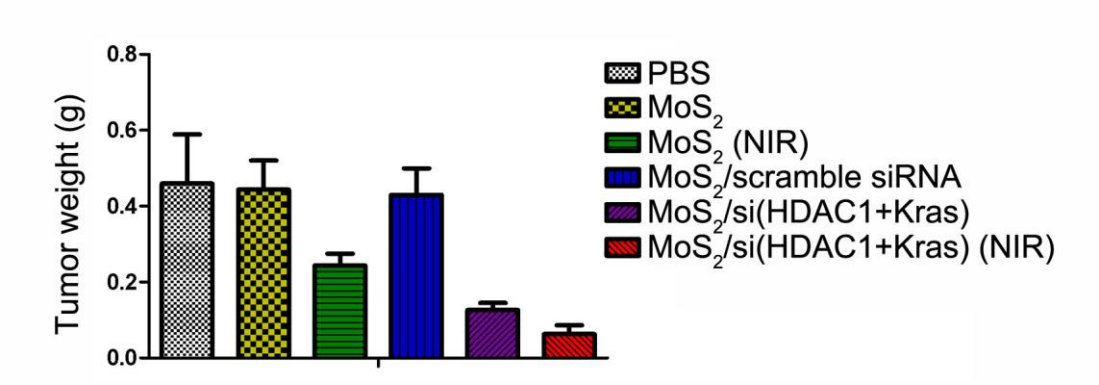

Figure S5: The tumor weights of nude mice are measured on day 28 after the treatments of PBS, FA/MoS_2, FA/MoS_2 with NIR light, FA/MoS_2/scramble siRNA, FA/MoS_2/si(HDAC1+Kras) or FA/MoS_2/si(HDAC1+Kras) with NIR light. Values are means ± SEM, n = 3.

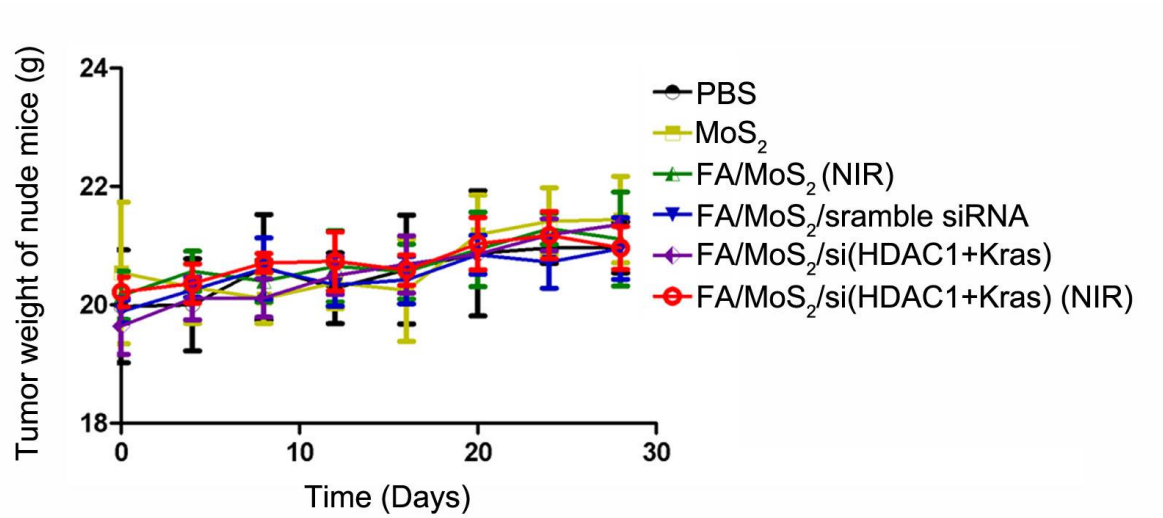

Figure S6: The body weights of nude mice are measured every other day treated by PBS, FA/MoS_2, FA/MoS_2 with NIR light, FA/MoS_2/scramble siRNA, FA/MoS_2/si(HDAC1+Kras) or FA/MoS_2/si(HDAC1+Kras) with NIR light. Values are means ± SEM, n = 3.

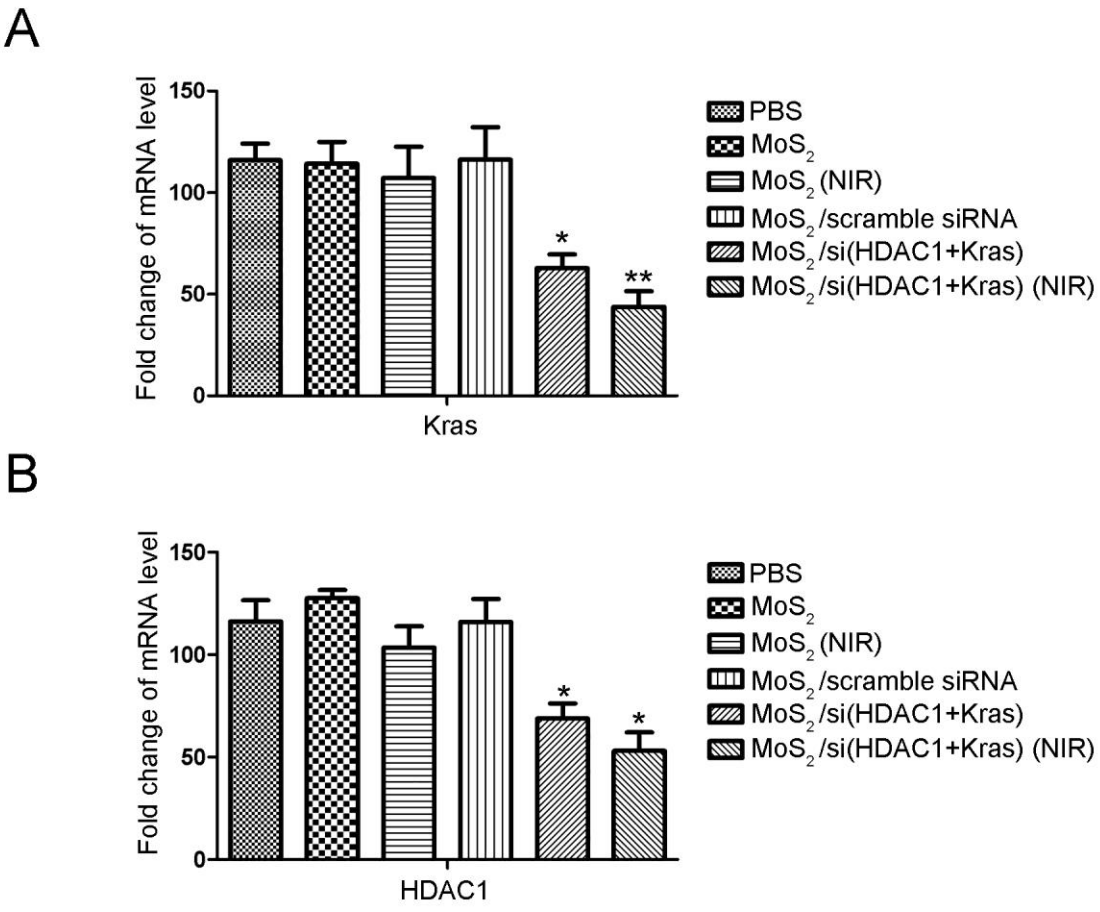

Figure S7: The relative mRNA expression levels of Kras and HDAC1 gene in pancreatic tumors are detected by RT-PCR. Values are means ± SEM, n = 3; **, $P < 0.01$ vs PBS (as control) and FA/MoS_2.

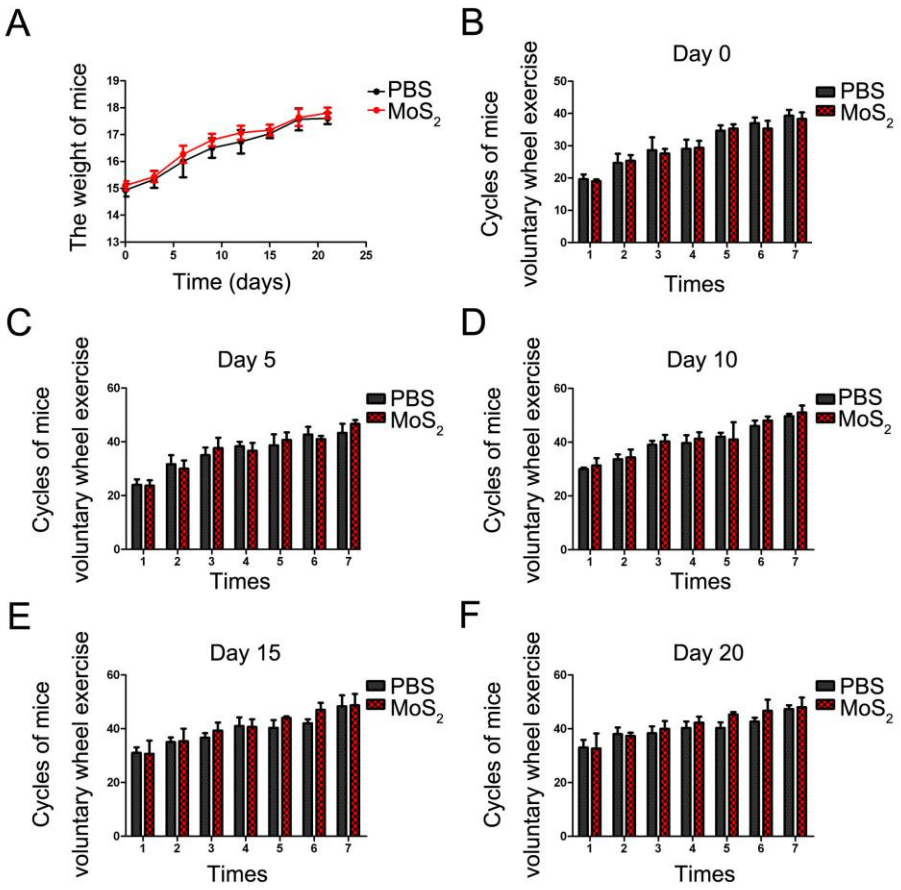

Figure S8: *In vivo* toxicity assessment of FA/MoS_2 nanoparticles in C57BL/6 mice. (A) The body weights of C57BL/6 mice are measured every two days post subcutaneous injection of PBS or FA/MoS_2 on day 0. (B-F) The effects of spatial learning, memory and movement in FA/MoS_2 nanoparticles treated C57BL/6 mice by voluntary wheel exercise at indicated time points.

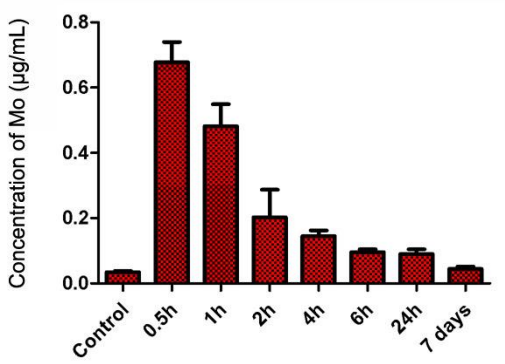

Figure S9: Blood circulation of MoS_2/PEG/FA/PAH after vein tail injection into C57BL/6 mice as determined by ICP-MS analysis at 0.5 hour, 1 hour, 2 hours, 4 hours, 6 hours, 24 hours, and 7 days.

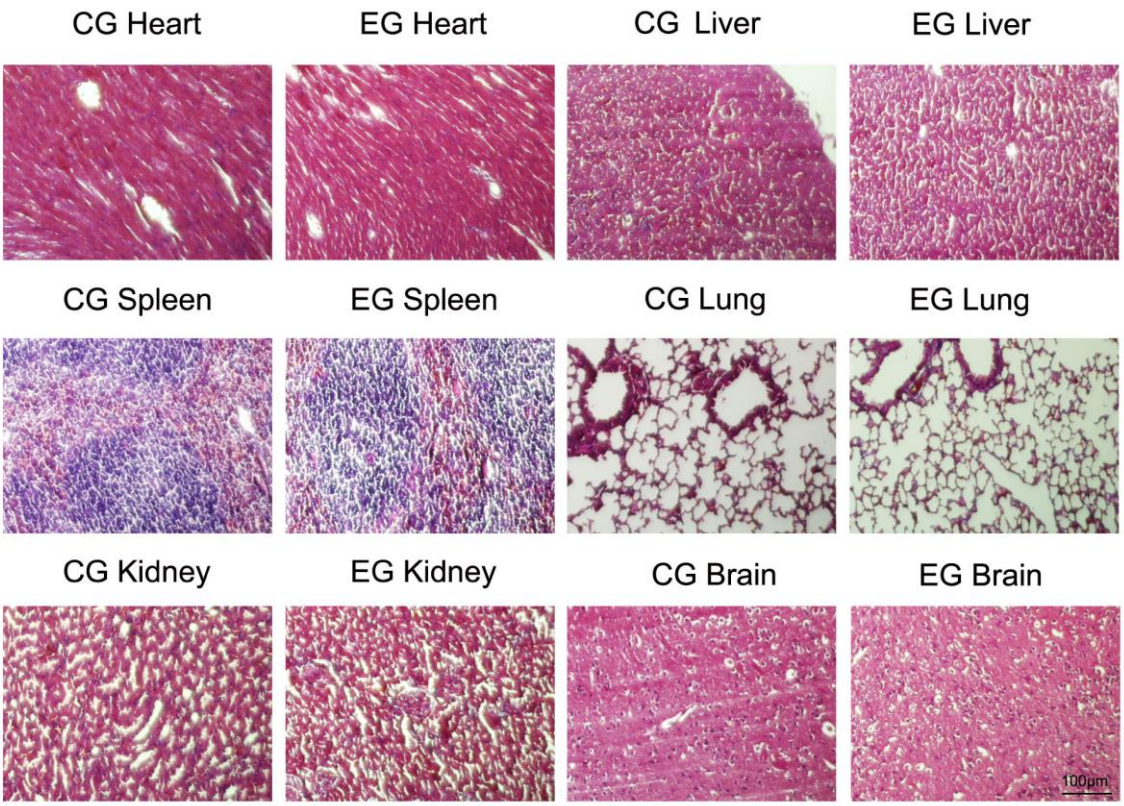

Figure S10: Histological studies on the major organs of the mice subcutaneously injected with PBS or FA/MoS_2 nanoparticles after three weeks. Tissues are harvested from heart, liver, spleen, lung, kidney and brain respectively. CG (control group) represents the group treated with PBS and EG (experimental group) represents the group treated with FA/MoS_2 nanoparticles**.**