Biomaterial Science

ARTICLE

Supporting information

for

Selenium-Driven Enhancement of Synergistic Cancer Chemo-/radiotherapy by Targeting Nanotherapeutics

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Methods

Stability Analysis: Specific amounts of SeD@MSNs-FA were dissolved in specific volume water, fetal bovine serum (FBS), and DMEM containing 10% FBS. The size of SeD@MSNs-FA were measured and recorded at seven consecutive days by Nano particle size analyzer.

Intracellular localization of SeD@MSNs-FA: The fluorescence microscope (EVOS FL) was employed to observe localization of SeD@MSNs-FA in Hela cells at different time point. Briefly, the Hela cells (8 x10 ^{4} cells/ mL, 2 mL) were seeded into 2 cm culture dishes and allowed to adhere for 24 h, subsequently, incubated with SeD@MSNs-FA. The nucleus and lysosomes were labeled by DAPI (blue) and Lyso tracker (red) respectively.

Hemolysis analysis: Human red blood cells (RBCs) were incubated with different concentrations SeD@MSNs-FA for different time (4h,8h) periods at 37℃. PBS solution and Triton X-100 (10 mg/L) were used as negative and positive controls, respectively. The RBCs were centrifuged to collect supernatant for calculating the hemolysis rate. In the end, we used a microscope to observe the morphology of RBCs.

Results

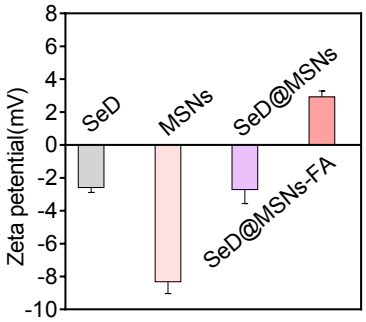

Figure S1. Zeta potential of SeD, MSNs, SeD@MSNs, SeD@MSNs and SeC@MSNs-FA nanoparticles

Table S1. Corresponding data table for MSNs and SeD@MSNs-FA.

Samples	Surface Area (m^2/g)	Pore Volume (cm^3/g)	Pore Size (nm)
MSNs	395.52	0.84	8.49
SeD@MSNs-FA	115.96	0.18	6.25

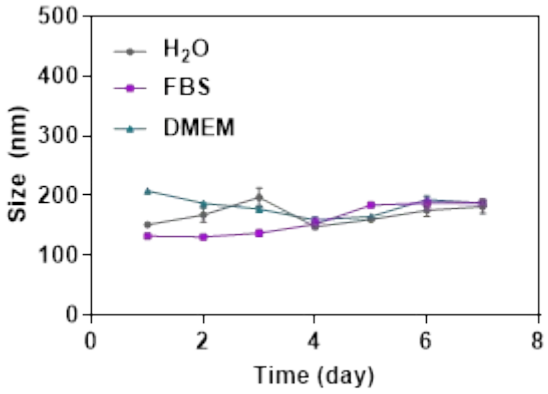

Figure S2. Stability of SeD@MSNs-FA in H_2O, FBS, DMEM.

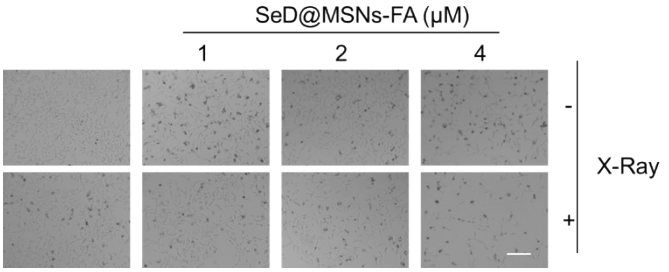

Figure S3. Morphology of HeLa cells after treatment with different concentrations (1, 2, and 4 μM) of SeD@MSNs-FA (24 h) and 4 Gy radiation. Scale bar is 200 μm.

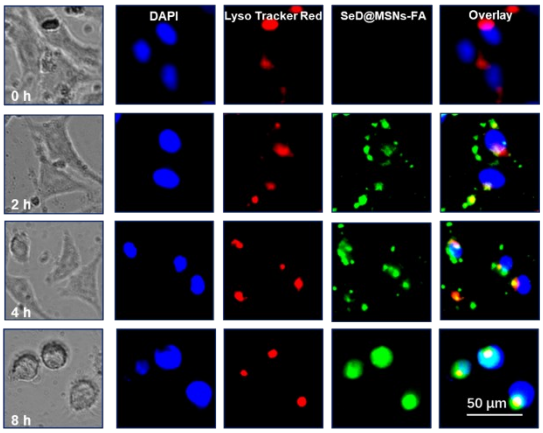

Figure S4. Fluorescence localization of SeD@MSNs-FA in HeLa cells. SeD@MSNs-FA produces a green fluorescence, LysoTracker red stained the lysosome, and PI stained the nucleus. The absorption of SeD@MSNs-FA into cells was observed under a fluorescent microscope at specific time points.

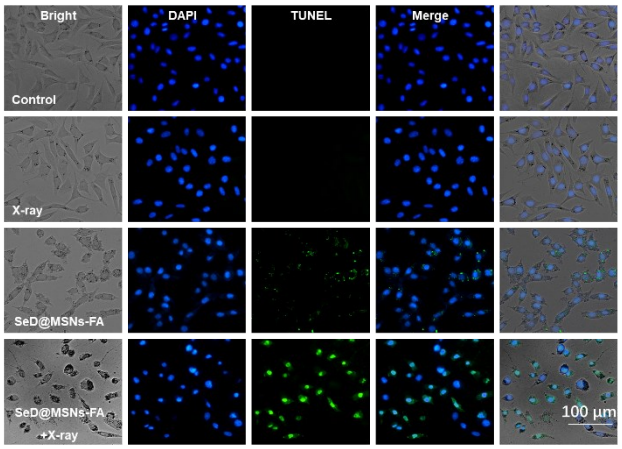

Figure S5. TUNEL and DAPI co-staining assay indicated that HeLa cells apoptosis occurred after treatment with SeD@MSNs-FA (1 μM) and radiation (2 Gy).

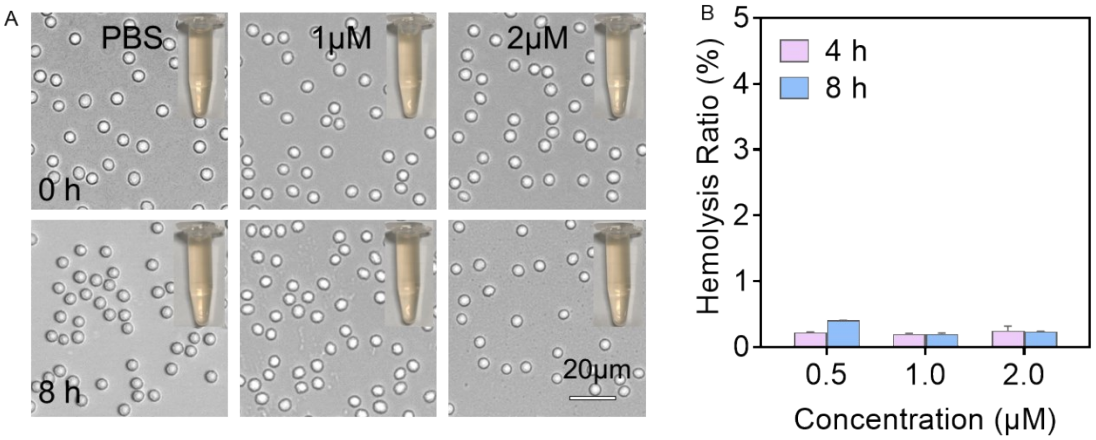

Figure S6. Compatibility of SeD@MSNs-FA with red blood cells. (A) Different concentration SeD@MSNs-FA (1 μM, 2 μM) on the lysis of red blood cells at different time points, and (B) hemolysis rate.