

# ADVANCED MATERIALS

## Supporting Information

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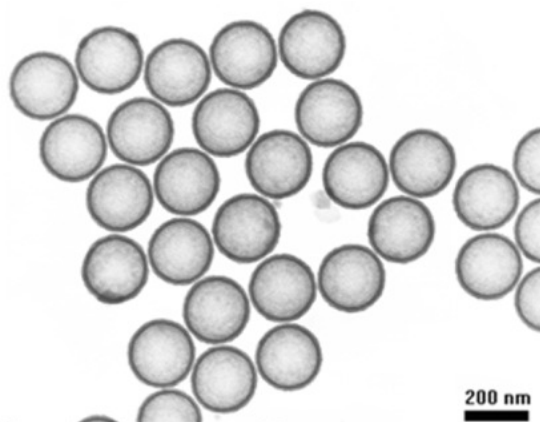
Stem Cells Loaded with Nanoparticles as a Drug Carrier for In Vivo Breast Cancer Therapy

*Binrui Cao, Mingying Yang, Ye Zhu, Xuwei Qu, and Chuanbin Mao\**

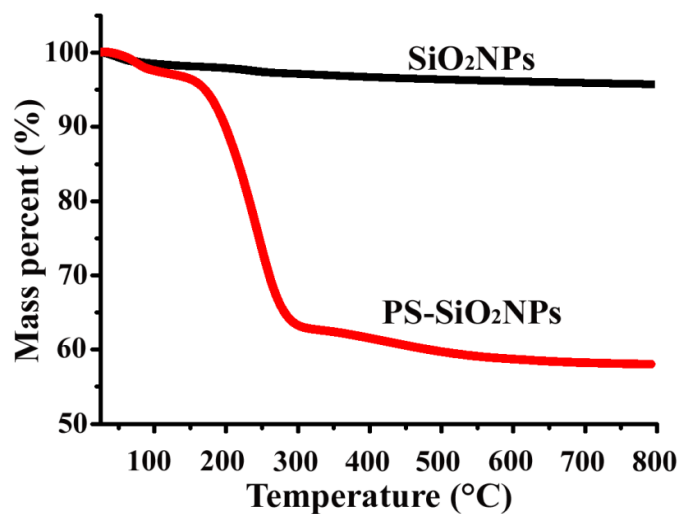
## Supporting Information

Nanoparticles-Loaded Stem Cells as a Drug Carrier for *in vivo* Breast Cancer Therapy

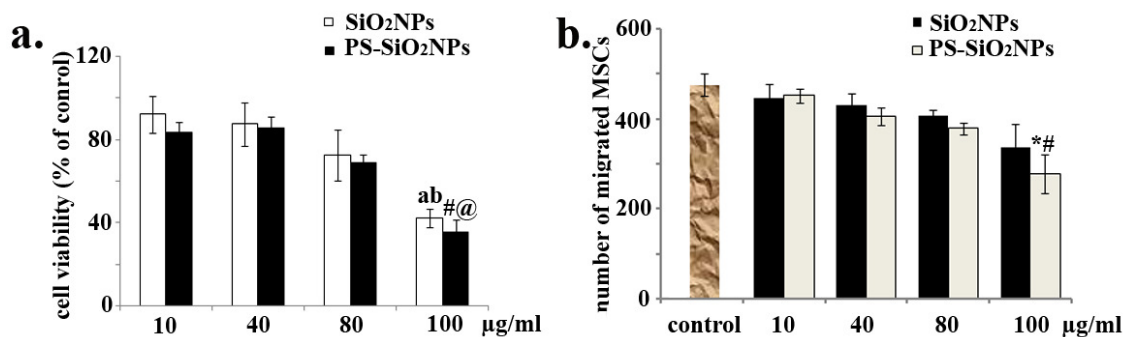
Binrui Cao, Mingying Yang,\* Ye Zhu, Xuwei Qu, and Chuanbin Mao\*



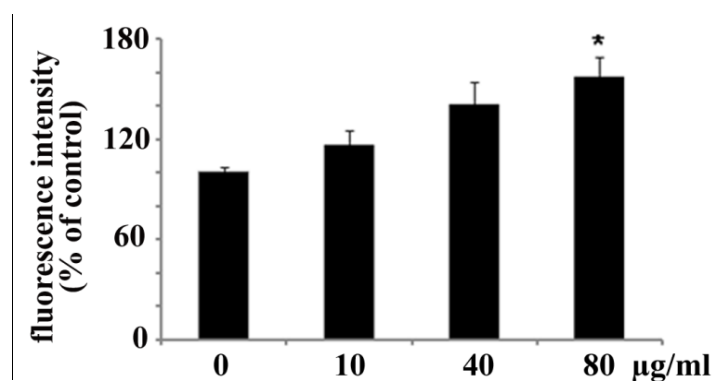
**Figure S1.** Porous hollow silica nanoparticles imaged by TEM.



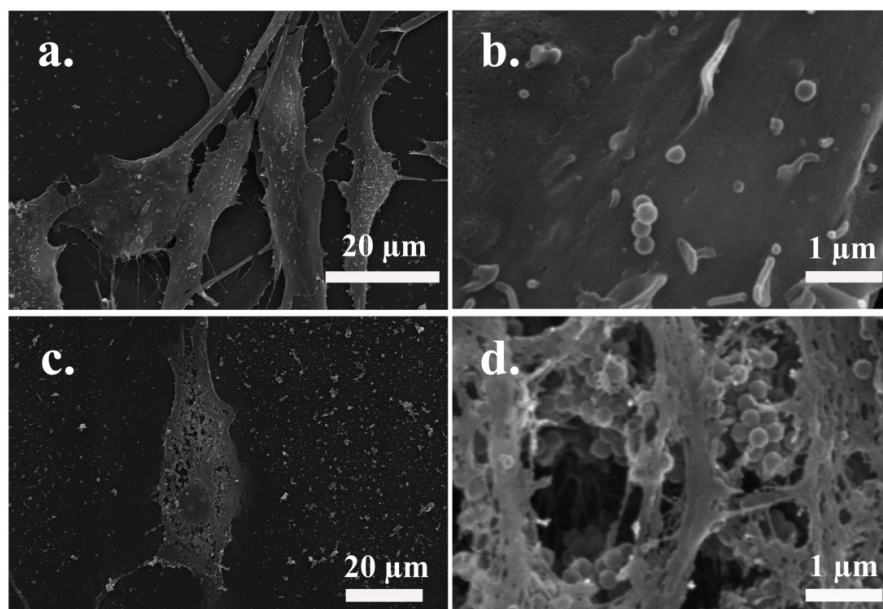
**Figure S2.** Thermogravimetric analysis (TGA) curves of silica nanoparticles with and without PS loaded (heating rate, 10°C/min).



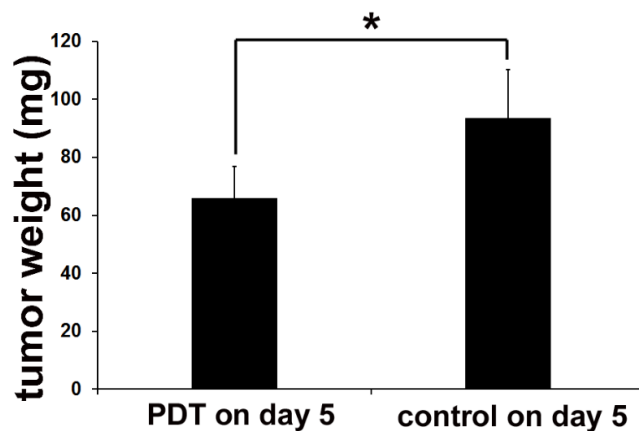
**Figure S3.** (a) MTT assay against MSCs in the presence of pure silica nanoparticles and PS-loaded silica nanoparticles at different concentrations after 24 h incubation in dark condition. (b) In vitro migration ability of MSCs after interaction with silica nanoparticles (with or without PS loaded) at different concentrations.



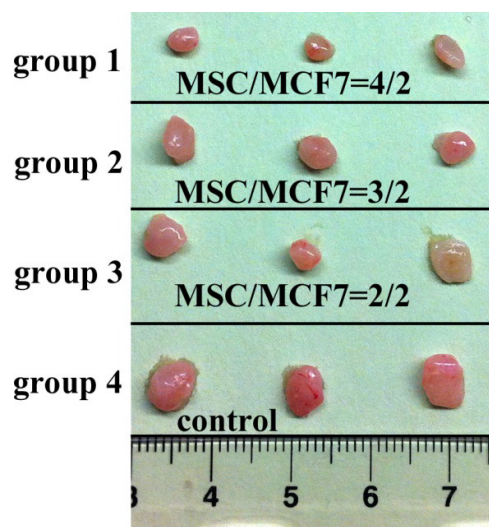
**Figure S4.** Evaluation of the level of intracellular ROS stained with a green dye DCFH-DA after light irradiation on MSCs. The fluorescence intensity from the dye stained ROS reflected the level of ROS in MSCs loaded with different concentrations of PS-SiO<sub>2</sub>NPs.



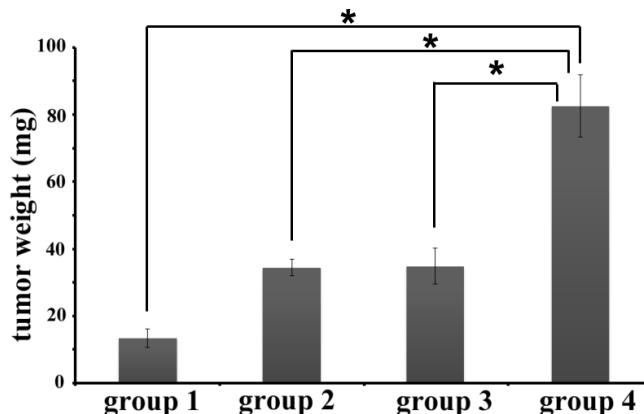
**Figure S5.** SEM images of MSCs loaded with PS-SiO<sub>2</sub>NPs before (a and b) and after (c and d) light irradiation. It was found that the surface of cells was intact and decorated by some nanoparticles before light irradiation (a and b). However, after light irradiation, the surface of cells was ruptured to expose the internalized nanoparticles (c and d).



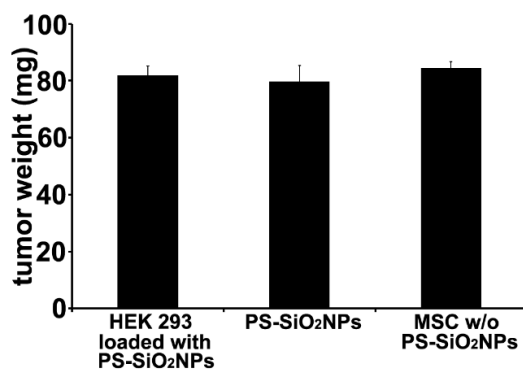
**Figure S6.** The weight of tumors of mice with PDT treatment 5 days after co-injection of MCF-7 cancer cells and MSCs with (PDT on day 5) or without (control on day 5) PS-SiO<sub>2</sub>NPs loaded. Asterisk indicates significant difference between two groups at  $p < 0.05$ .



**Figure S7.** Pictures showing the size of tumors isolated from mice treated by PDT on day 1 after injection of different ratios of MCF-7 cancer cells to MSCs ( $n=3$ ). Group 1: MSC/MCF-7=4:2 ( $2 \times 10^6$  PS-SiO<sub>2</sub>NPs-MSCs and  $1 \times 10^6$  MCF-7 cells); Group 2: MSC/MCF-7=3:2 ( $1.5 \times 10^6$  PS-SiO<sub>2</sub>NPs-MSCs and  $1 \times 10^6$  MCF-7 cells); Group 3: MSC/MCF-7=2:2 ( $1 \times 10^6$  PS-SiO<sub>2</sub>NPs-MSCs and  $1 \times 10^6$  MCF-7 cells); Group 4: control where MSCs were not loaded with PS-SiO<sub>2</sub>NPs but laser light was still applied ( $1.5 \times 10^6$  MSCs and  $1 \times 10^6$  MCF-7 cells).



**Figure S8.** The weight of tumors isolated from mice which received PDT on day 1 after injection of different ratios of MCF-7 cancer cells to MSCs ( $n=3$ ). Group 1: MSC/MCF-7=4:2 ( $2 \times 10^6$  PS-SiO<sub>2</sub>NPs-MSCs and  $1 \times 10^6$  MCF-7 cells); Group 2: MSC/MCF-7=3:2 ( $1.5 \times 10^6$  PS-SiO<sub>2</sub>NPs-MSCs and  $1 \times 10^6$  MCF-7 cells); Group 3: MSC/MCF-7=2:2 ( $1 \times 10^6$  PS-SiO<sub>2</sub>NPs-MSCs and  $1 \times 10^6$  MCF-7 cells); Group 4: control where MSCs were not loaded with PS-SiO<sub>2</sub>NPs but laser light was still applied ( $1.5 \times 10^6$  MSCs and  $1 \times 10^6$  MCF-7 cells). Asterisk indicates  $p < 0.05$  for comparison against control (group 4).



**Figure S9.** The weight of tumors isolated from mice treated by PDT on day 1 after injection of  $1 \times 10^6$  MCF-7 cancers with (1)  $1.5 \times 10^6$  HEK 293 cells loaded with PS-SiO<sub>2</sub>NPs; (2) 40  $\mu$ g PS-SiO<sub>2</sub>NPs; and (3)  $1.5 \times 10^6$  MSCs without PS-SiO<sub>2</sub>NPs loaded. No significant differences were observed among groups ( $p > 0.05$ ).