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Electronic Supplementary Information

Fabrication of Mn-Ferrite Nanoparticles from MnO Colloids

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Experimental Section

Synthesis of Mn-Ferrite nanocrystals: The 20 nm sized MnO NPs were formed by heating 0.3 mmol of Mn-oleate and 0.3 mmol of oleic acid in 1-octadecene solvent.[4c] The prepared MnO NPs were added to a mixture containing 0.3mmol of Fe-oleate, 0.3 mmol of oleic acid and 7 ml of 1-octadecene. The mixed solution was degassed at 110 ºC for 1.5 h under a vacuum to remove the water and oxygen. The solution was then heated to 280 ºC at a heating rate of 3 ºC min^{-1} under a N2 atmosphere. The reaction mixture was maintained at this temperature for 3h to induce sufficient growth. The solution was cooled to room temperatures. The nanoparticles were precipitated from the reaction solution by adding ethanol and separated using a centrifuge. The same procedure is used to prepare Co-Ferrite NPs.

Surfactants exchange: 10 mg of nanocrystals were dispersed in 2 ml of THF. 20 mg of phospholipids mPEG 2000PE (Avanti) was added to the solution and dissolved. After evacuation of THF, it was incubated at 70 ºC under vacuum for 1 h. 5 ml of water was added and dispersed nanocrystals were filtered by 200 nm syringe filter. Unbound phospholipids was eliminated by dialysis.

Cytotoxicity experiments: Cell culture. MDA-MB 231 and MDA-MB 435S were from American Type Culture Collection (ATCC), and cultured in DMEM supplemented with 10% fetal bovine serum and antibiotics (Life Technologies). MCF-10A (from ATCC) was cultured in serum-free Mammary Epithelial Growth Medium (MEGM, Clonetics Corp.) supplemented with 100 ng mL^{-1} cholera toxin, bovine pituitary extract, insulin, human epidermal growth factor, hydrocortisone, and antibiotics. Cell culture passage number less than five was used in the present study.

Measurement of cellular viability. Cell viability was assessed by double labeling of cells with 2 μM calcein-AM and 4 μM EthD-1. The calcein-positive live cells and EthD-1-positive dead cells were visualized using fluorescence microscope (Axiovert 200M, Zeiss) and counted.

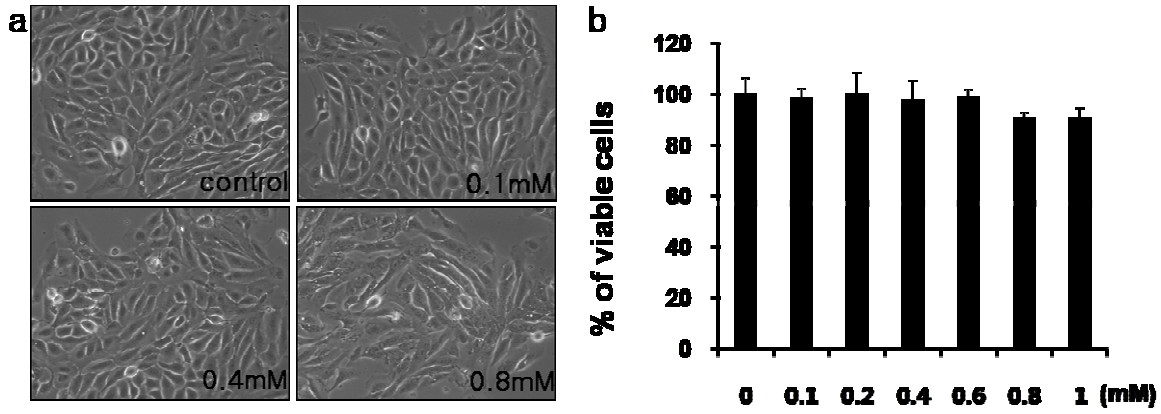

Figure S1. Cytotoxicity of manganese ferrite under a specific concentration against MCF-10A cells (Normal cells)

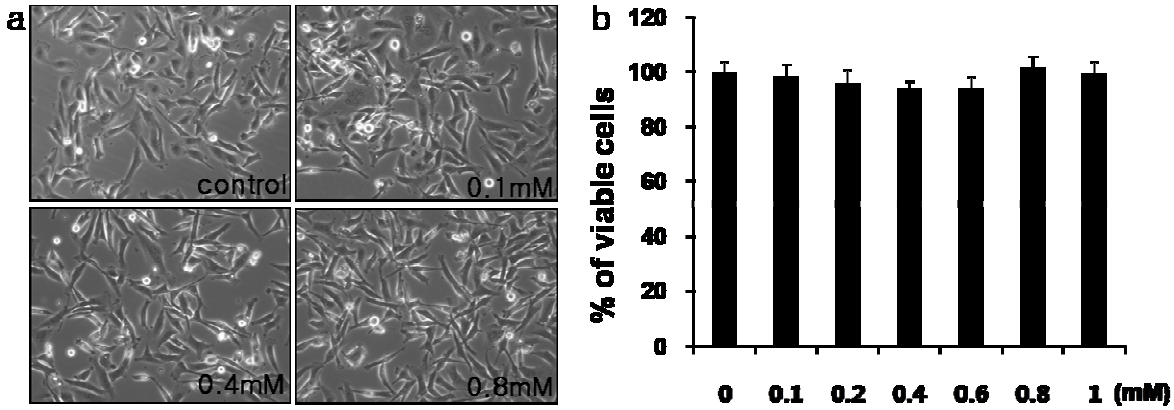

Figure S2. Cytotoxicity of manganese ferrite under a specific concentration against MDA-MB 231 cells

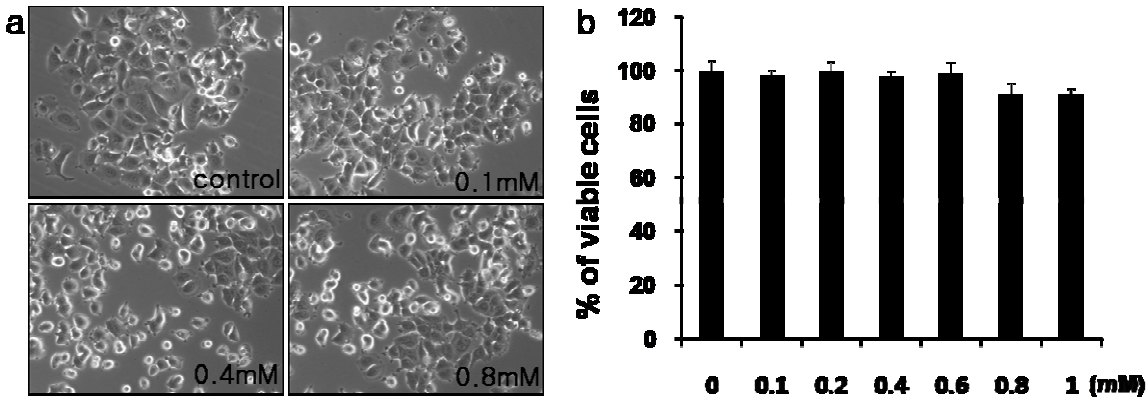

Figure S3. Cytotoxicity of manganese ferrite under a specific concentration against MCF-7 cells