Supporting Information

Dendritic Mesoporous Organosilica Nanoparticles: a pH-Triggered Autocatalytic Fenton Reaction System with Self-supplied H_2O_2 for Generation of High Levels of Reactive Oxygen Species

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Characterization

FT-IR spectroscopy was carried out on a Nicolet 5700 spectrophotometer. The UV/Vis absorption and fluorescence emission spectra were performed on UV-2600 and Shimadzu RF5301PC spectrophotometer, respectively.

Transmission electron microscope (SEM) photos were taken via a field emission scanning electron microscope (JSM 7600). Before observation, the sample powder was evenly spread over the sample holder and then coated with a conductive film. Next, the electron microscopy was performed. The diameter of TA/Fe@GOD@DMONs was measured with Image J 1.40 G software.

Transmission electron microscopy (TEM) was performed with a JEOLJEM-1011 electron microscope under 100 kV accelerating voltage. Sample was prepared by placing a drop of dilute dispersions in ultrapure water on the surface of a copper grid.

The hydrodynamic size was performed by dynamic light scattering (DLS) on a Brookhaven A8530 instrument. Briefly, TA/Fe@GOD@DMONs suspended in water (1.0 $mgmL^{-1}$) were analyzed with a Brookhaven A8530 instrument. The dispersion of DMONs was diluted by ultrapure water according to the mass concentration and completely sonicated before measurement. Then the sample suspension was filtered through a membrane filter with 0.45 mm nominal pore size for three times. The measured values were averaged by six runs.

The zeta potential of TA/Fe@GOD@DMONs suspension was determined by ZetaPlus zeta-potential analyzer (Brookhaven Instruments Co., TX, USA) at 25 ^{o}C. The suspension of DMONs was diluted by ultrapure water. The pH value and concentration of the DMONs dispersion were determined before measurement.

N_2 adsorption/desorption isotherms were measured and collected on automated gas sorption analyser (Autolab-iQ, Quantachrome Instruments). The pore size distribution curve was derived from the adsorption branch of the isotherms using the Barrett–Joyner–Halanda (BJH) method. The Brunauer–Emmett–Teller (BET) method was utilized to calculate the specific surface areas. The total pore volume was calculated from the amount adsorbed at a maximum relative pressure (P/P_0) of 0.99.

X-ray photoelectron spectroscopy (XPS) was used to study the chemical nature of the TA/Fe@GOD@DMONs using ESCALab250 (Thermal Scientific). Cell fluorescence images were captured with a confocal laser scanning microscopy (CLSM, LSM810, Carl Zeiss). Apoptosis and cell ROS production were evaluated by a BD LSRFortessa X-20 cell analyzer.

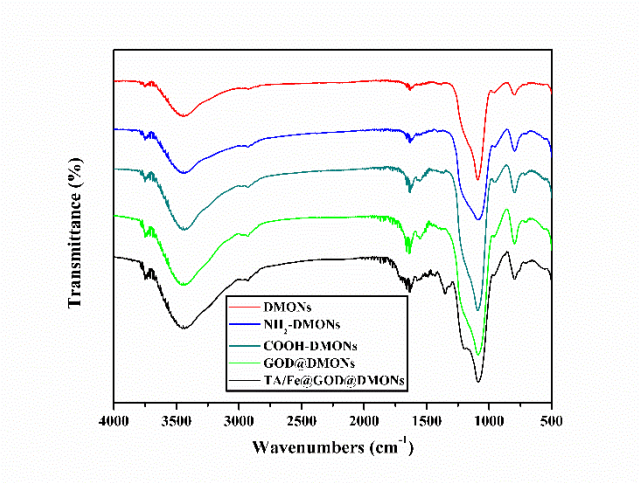

Figure S1 FTIR spectra of DMONs, NH_2-DMONs, COOH-DMONs, GOD@DMONs and TA/Fe@GOD@DMONs.

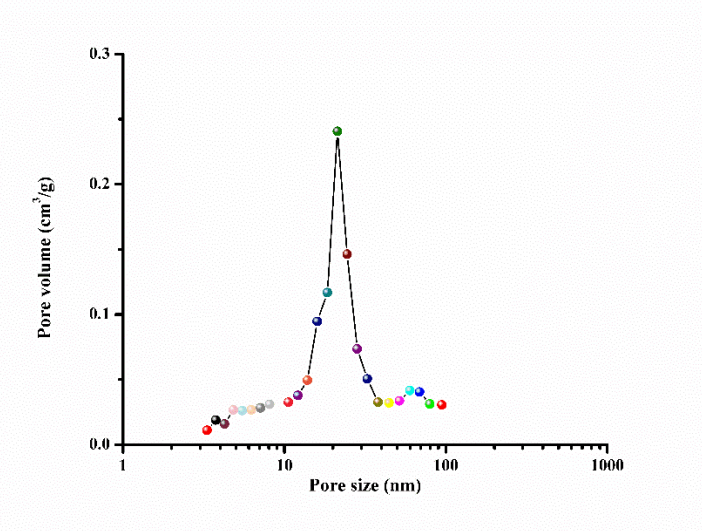

Figure S2 The pore size of the prepared DMONs.

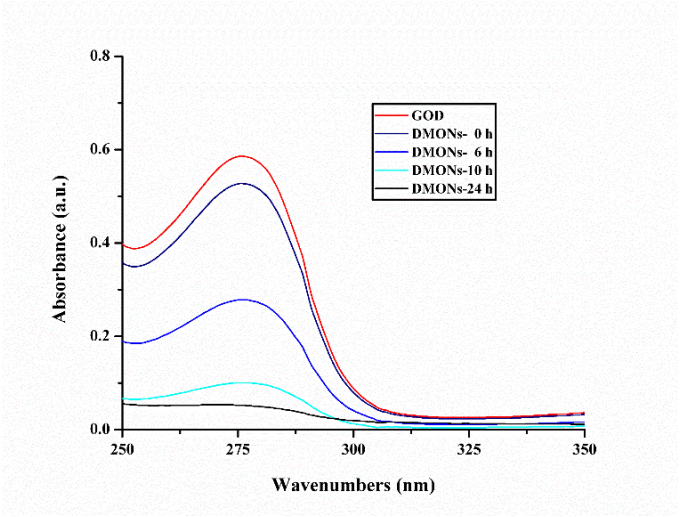

Figure S3 UV/Vis spectra of GOD@DMONs in phosphate buffered saline (PBS) after been incubated for 0, 6, 10, 12 h.

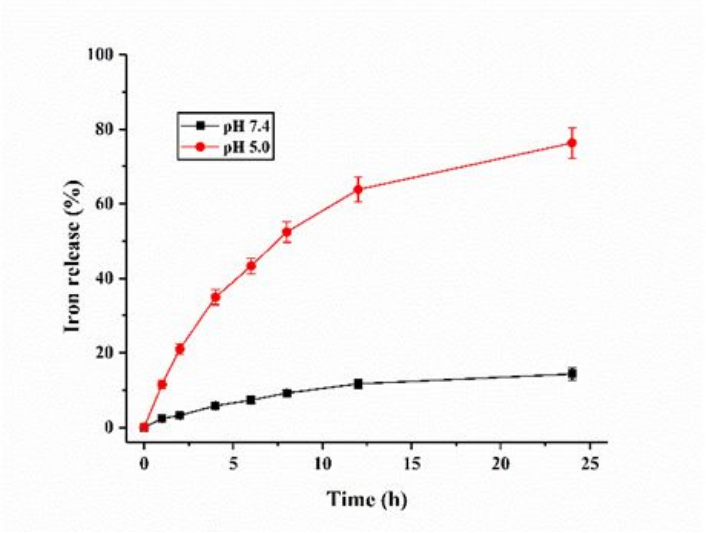

Figure S4 Iron release behaviors of TA/Fe@GOD@DMONs at pH = 7.4 and 5.0 (37 °C).

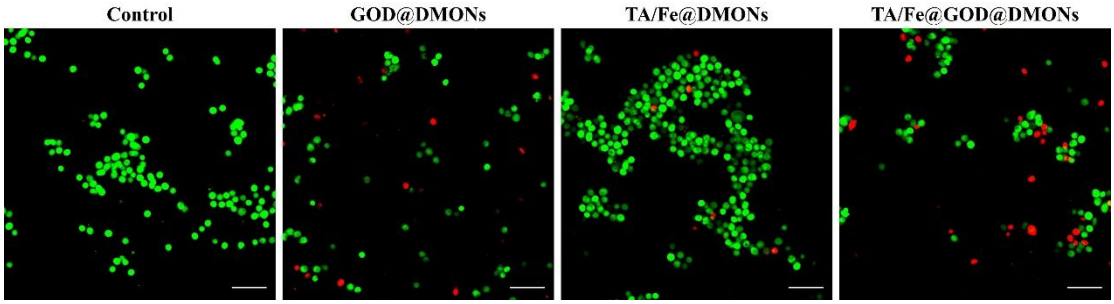

Figure S5 Fluorescence images of MCF-7 cells in live-dead staining experiments, w/o laser irradiation (808 nm, 1.0 W cm^{-2}, 5 min).

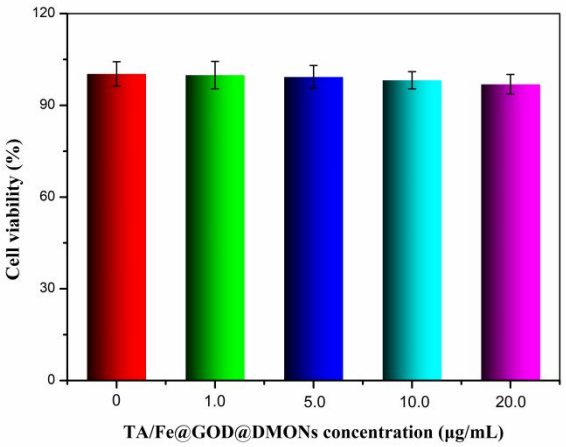

Figure S6 Cell viability of MCF10A cells after incubation of TA/Fe@GOD@DMONs with various concentrations for 24 h.