Fabrication of Mesoporous Silica Nanoparticles Hybridized with Fluorescent AIE-active Quinoline-malononitrile for Drug Delivery and Bioimaging

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Characterization of QM-COOH

^{1}H NMR (400 MHz, $CDCl_3$, ppm): δ=1.41 (t, J = 8.0 Hz, 3H, -NCH$_2$*CH$_3$*), 4.59 (q, J = 8.0 Hz, 2H, -N*CH$_2$*CH$_3$), 7.04 (s, 1H, pyrole-H), 7.45 (d, J = 16.0 Hz, 1H, alkene-H), 7.58 (d, J = 16.0 Hz, 1H, alkene-H), 7.63 (t, J = 8.0 Hz, 1H, phenyl-H), 7.76 (d, J = 8.0 Hz, 2H, phenyl-H), 7.94 (m, 3H), 8.11 (d, J = 8.0 Hz, 1H, phenyl-H), 8.94 (d, J = 8.0 Hz, 1H, phenyl-H). ^{13}C NMR (400 MHz, $CDCl_3$, ppm): δ= 13.97, 15.02, 29.72, 43.99, 50.78, 107.20, 116.13, 116.67, 119.36, 120.35, 121.51, 123.16, 123.22, 124.62, 126.88, 129.21, 129.24, 129.36, 132.98, 133.18, 133.24, 135.83, 137.40, 138.13, 139.91, 147.04, 147.50, 147.56, 153.19. HRMS (TOF-ESI$^-$): m/z calcd for $C_{23}H_{16}N_3O_2$ [M-H$^+$]:366.1243; found: 366.1240.

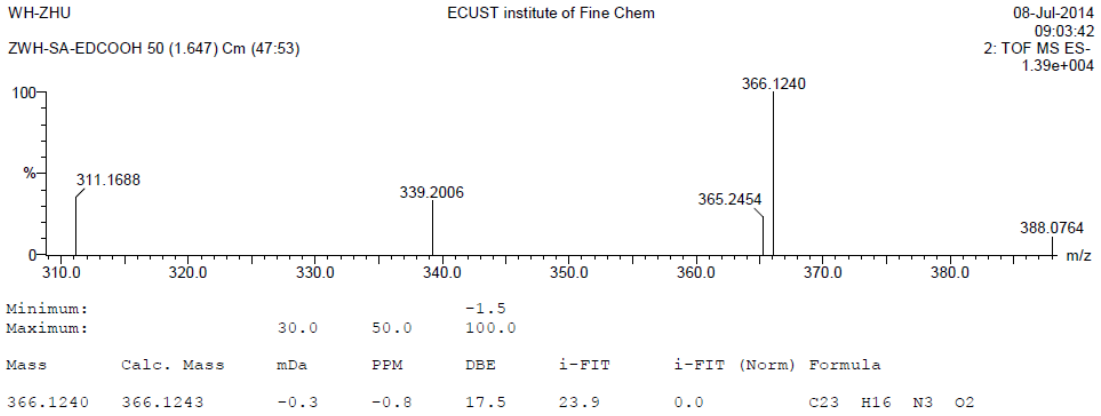

Figure S1. MS spectrum of QM-COOH.

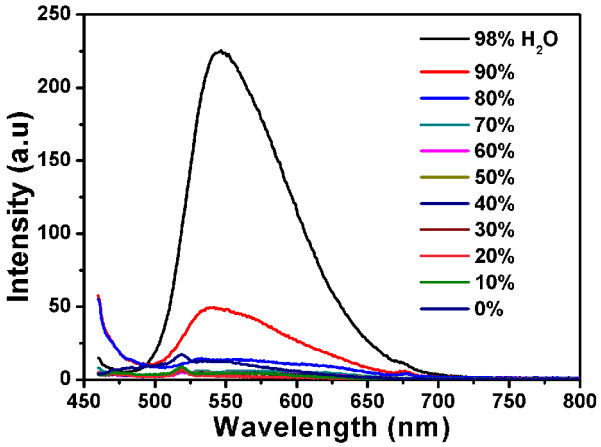

Figure S2 Photoluminescence (PL) spectra of QM-COOH in H_2O/THF mixtures with different volume fractions of water

Long-Term Cell Tracing. MCF-7 cells were seeded into 6-well plate at a density of 10^4 cells per well, then MCF-7 cells were incubated at 37 °C with 5% CO_2 for 24 h. The medium was removed and cells were washed with PBS buffer solution (pH=7.4). The cells then were incubated with FMSNs at 50,100,100 μg mL^{-1} for 24 h. (first day) Then cells were washed with PBS for several times and trypsinized. Part of the digestive cells were used for analyzed by flow cytometer, the remaining cells were resuspended and then incubated at 37 °C with 5% CO_2 for another 24 h.(second day). So did the third day.

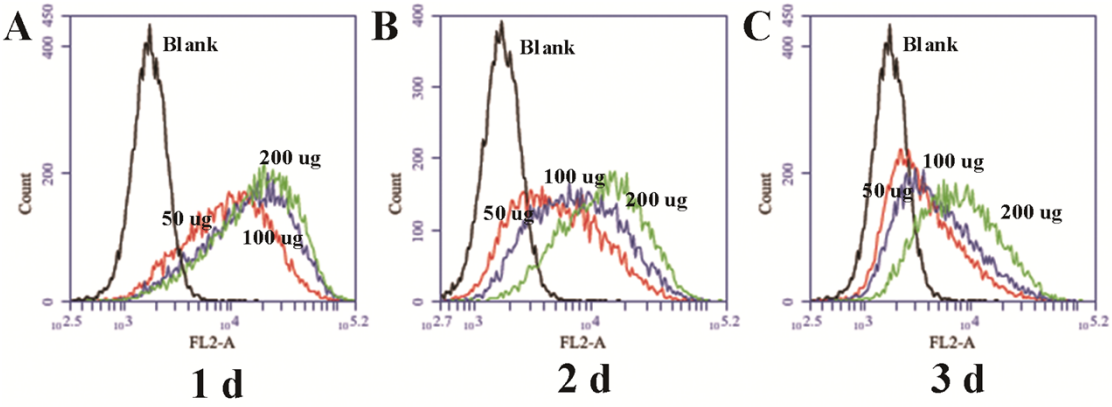

Figure S3. Flow cytometry histograms of MCF-7 breast cancer cells after incubation with 0 μg mL^{-1}, 50 μg mL^{-1}, 100 μg mL^{-1} and 200 μg mL^{-1} of FMSNs. (A) 1 day, (B) 2 days and (C) 3 days.

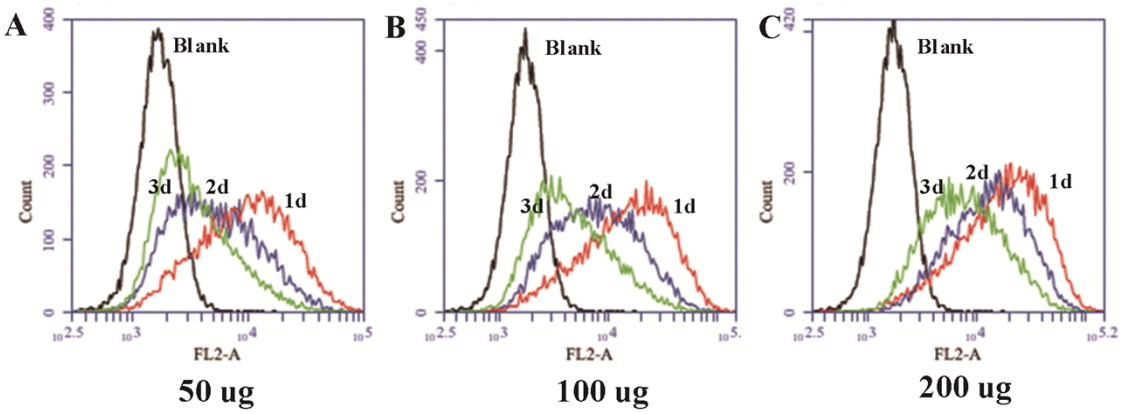

Figure S4 Flow cytometry histograms of MCF-7 breast cancer cells after incubation for 1 day, 2 days and 3 days. (A) 50 μg mL^{-1} (B) 100 μg mL^{-1} and (C) 200 μg mL^{-1} of FMSNs .

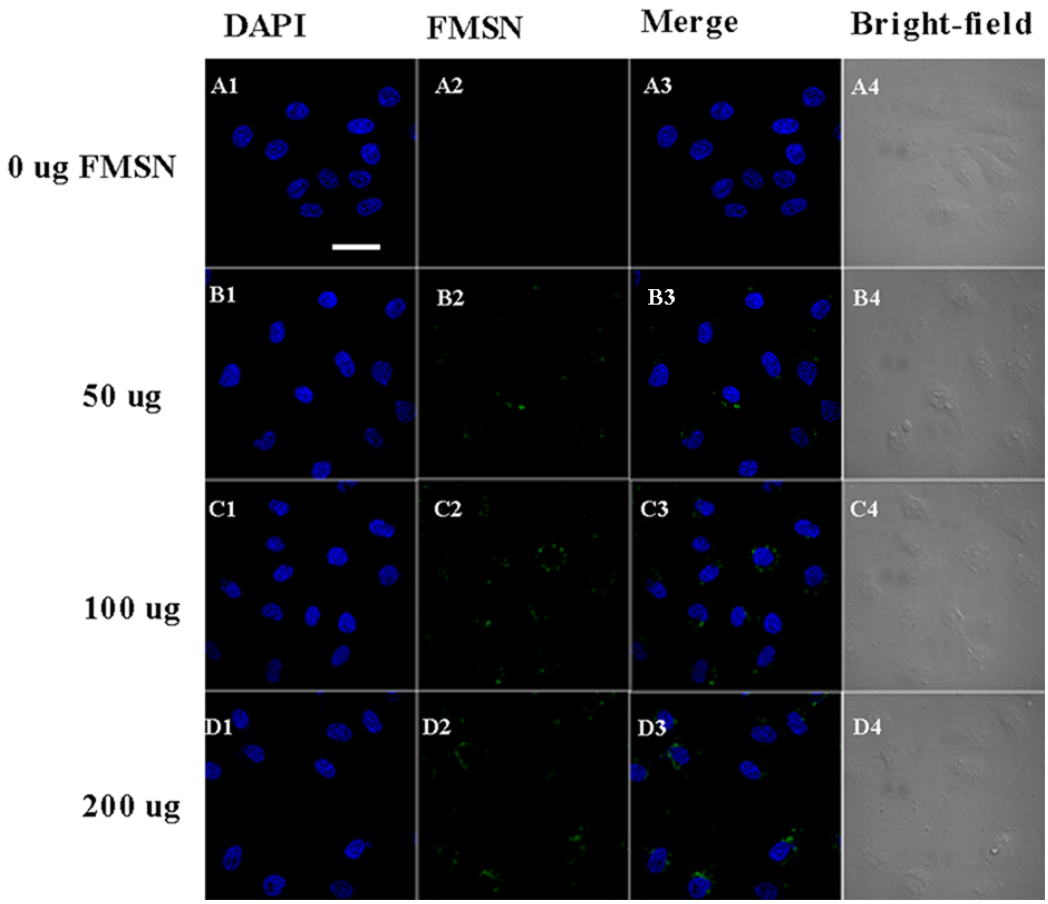

Figure S5 CLSM images of MCF-7 cells incubated with FMSNs for 24 h. The concentrations of FMSNs were (A) 0 μg mL^{-1}, (B) 50 μg mL^{-1}, (C) 100 μg mL^{-1} and (D) 200 μg mL^{-1}. All images share the same scale bar (50 μm).