*Supplement materials for*

# A nanoparticles-based biocompatible and long-life marker for lysosome labeling and tracking

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**Figure S1.** Lysosome labeling with RuBpy-DSiNPs in living cells. Laser sanning confocal microscopy images of Hela cells that were firstly incubated with 80 μg/mL RuBpy-DSiNPs for 3 hours, and then received a 6-hour post-incubation in the nanoparticles-free serum medium. Lysosome labeling was done with LysoTracker Green (500 nM) just 5 minutes before cell imaging. (RuBpy-DSiNPs channel: EX 488 nm, EM 560 nm longpass. LysoTracker Green channel: EX 488 nm, EM 505-525 nm bandpass. Gray channel: optical images. Yellow: colocalization of red and green fluorescence.)

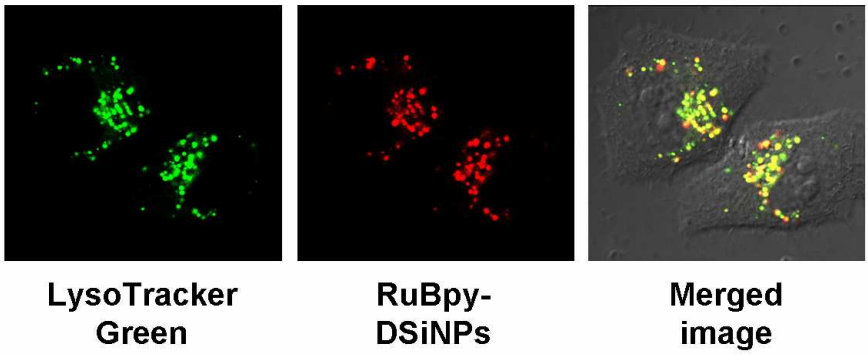

**Figure S2.** Laser sanning confocal microscopy images of Hela cells that were firstly incubated with 80 μg/mL TAMRA-DSiNPs for 3 hours and then received (a) 1-day, (b) 2-day, (c) 3-day, (d) 4-day and (e) 5-day post-incubation, respectively. Lysosome labeling was done with LysoTracker Green (500 nM) just 5 minutes before cell imaging. (TAMRA-DSiNPs channel: EX 543 nm, EM 560 nm longpass. LysoTracker Green channel: EX 488 nm, EM 505-525 nm bandpass. Gray channel: optical images. Yellow: colocalization of red and green fluorescence.)

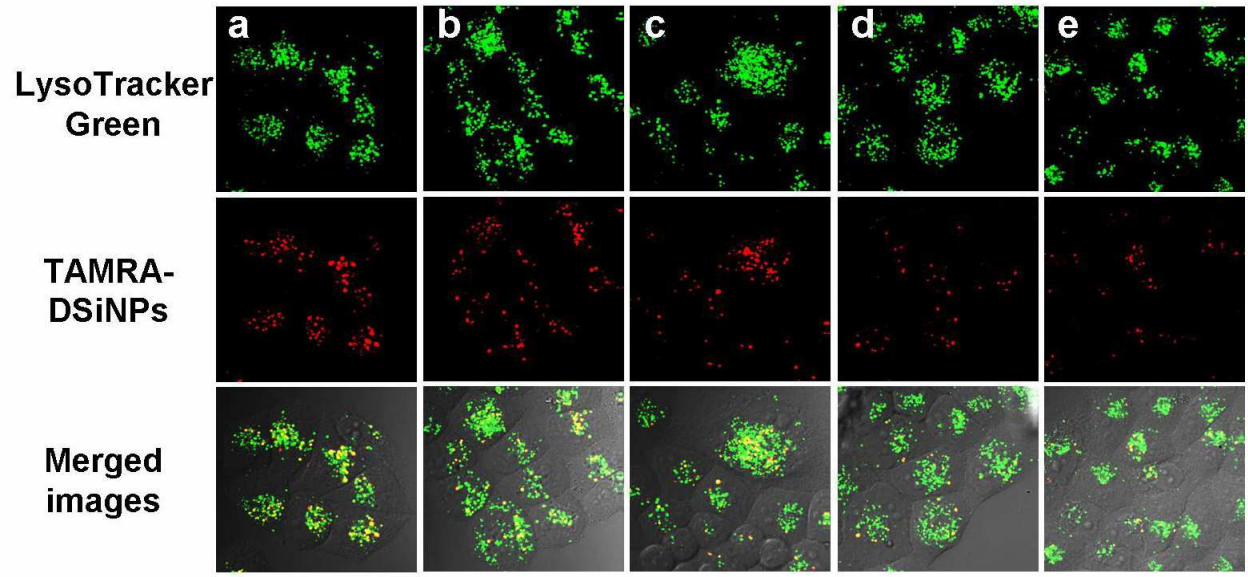

**Figure S3.** Hela cells labeled with LysoTracker Green were harvested to be detected by flow cytometer after (b) 0-hour, (c) 2-hour, (d) 1-day, (e) 2-day, and (f) 5-day post-recultivation, respectively. Curve a was the Hela cells without staining.

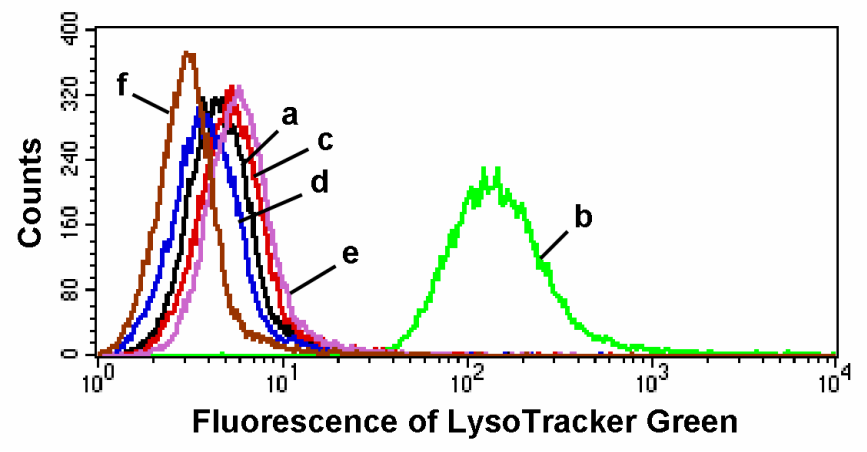

**Figure S4.** The effect of lysosome labeling with TAMRA-DSiNPs on cell viability. Hela cells were incubated with 200 µg/mL TAMRA-DSiNPs for 3 hours and then in fresh nanoparticles-free serum medium with the post-incubation time increased from 0-6 days. %Viable vs. unstained control cells was calculated through dividing the optical density of the stained cells by that of the unstained cells.

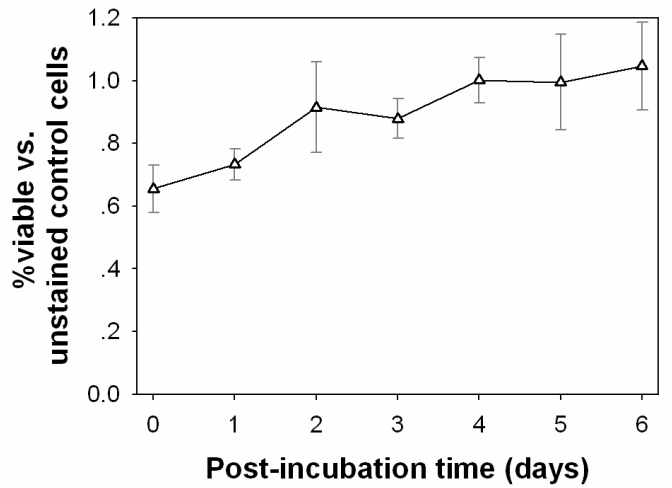

**Figure S5.** Lysosome tracking with TAMRA-DSiNPs in chloroquine-treated Hela cells. Hela cells were firstly labeled with TAMRA-DSiNPs, and then treated with 100 μM chloroquine for 3 hours. Laser sanning confocal microscopy images were acquired (a) before, or after treatment with chloroquine followed by (b) 6-hour or (c) 23-hour post-incubation in fresh serum medium. Lysosome labeling was done with LysoTracker Green (500 nM) just 5 minutes before cell imaging. (TAMRA-DSiNPs channel: red signals; EX 543 nm, EM 560 nm longpass. LysoTracker Green channel: green signals; EX 488 nm, EM 505-525 nm bandpass. Yellow: colocalization of red and green fluorescence.)