Electronic Supplementary Material (ESI) for RSC Advances.

Supplementary Figures: 'FRET-reporter nanoparticles to monitor redox-induced intracellular delivery of active compounds'

by Tina Gulin-Sarfraz,[a] Jawad Sarfraz,[a‡] Didem Şen Karaman,[a‡] Jixi Zhang,[a‡] Christina Oetken-Lindholm,[b] Alain Duchanoy,[a] Jessica M. Rosenholm[a*] and Daniel Abankwa[b*]

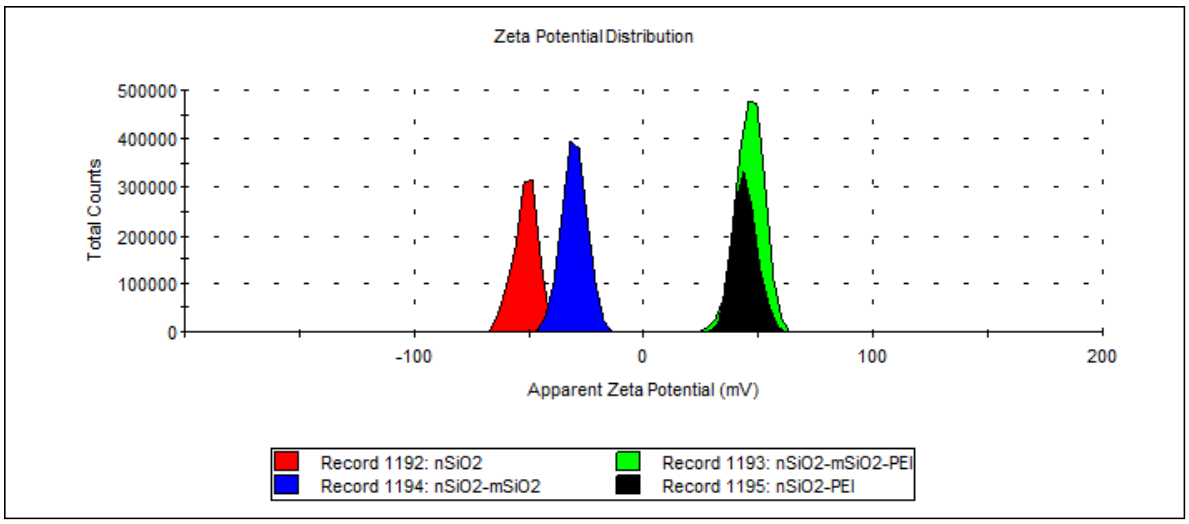

Fig. S1 Electrokinetic measurements (zeta potential) of the plain silica cores (nSiO$_2$), core-shell particles (nSiO$_2$@mSiO$_2$), PEI-functionalized silica cores (nSiO$_2$@PEI) and PEI-functionalized core-shell particles (nSiO$_2$@mSiO$_2$@PEI).

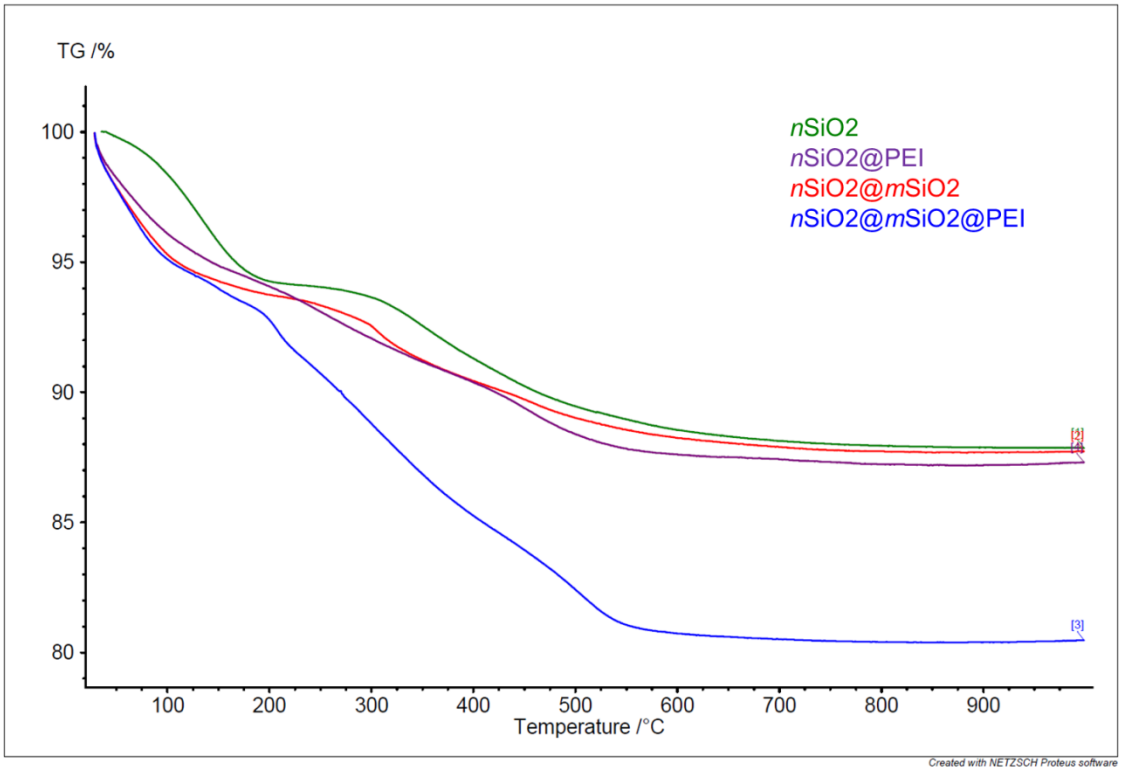

Fig. S2 Thermogravimetric analysis (TGA) of the plain silica cores (nSiO$_2$), core-shell particles (nSiO$_2$@mSiO$_2$), PEI-functionalized silica cores (nSiO$_2$@PEI) and PEI-functionalized core-shell particles (nSiO$_2$@mSiO$_2$@PEI).

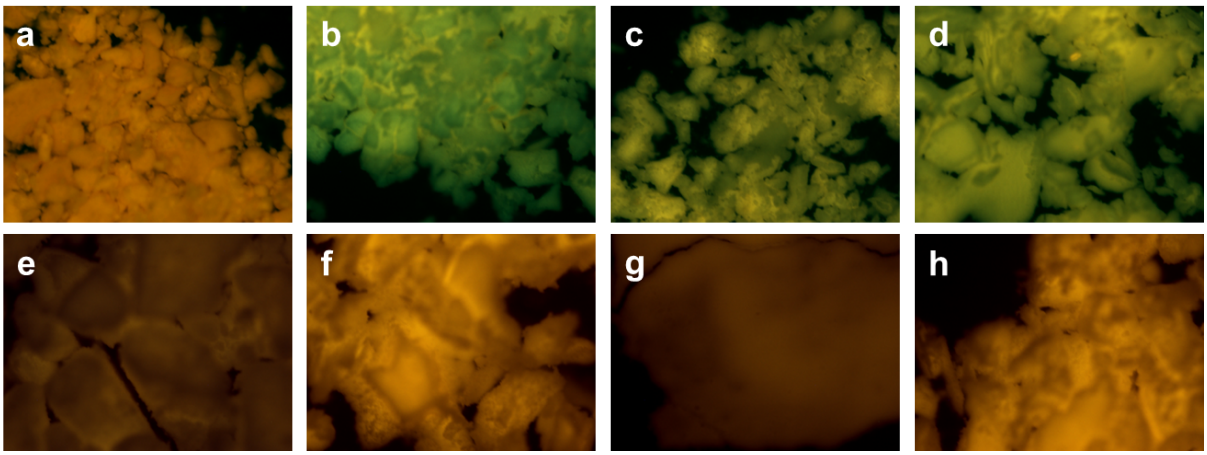

Fig. S3 Loss of red emisson from the cleavable particles, while no loss of red emission from the non-cleavable control particles, was observed after treatment with reducing agents. Particles were incubated for one hour in test tubes with a concentration of a reducing agent (10 mM gluthatione, GSH) corresponding to intracellular conditions at endosomal pH. As comparision equal concentration of an artifical reducing agent (DTT) was introduced at pH 5 and pH 7. The particles were dried on glass slides and imaged with a Nikon Microphot-FXA light microscope using UV light for excitation and a dual FITC-TRITC filter, which simultaneously gave rise to emission from both of the fluorescenct dyes. Figure (a) represent the cleavable particles before introducing reducing agent, while (b-d) show the cleavable particles after introducing cleavable agents; DTT at pH 7 (b), DTT at pH 5 (c), and GSH at pH 5 (d). Figure (e) represents the non-cleavable control particles before introducing reducing agent, while (f-h) show the non-cleavable particles after introducing cleavable agents; DTT at pH 7 (f), DTT at pH 5 (g), and GSH at pH 5 (h).

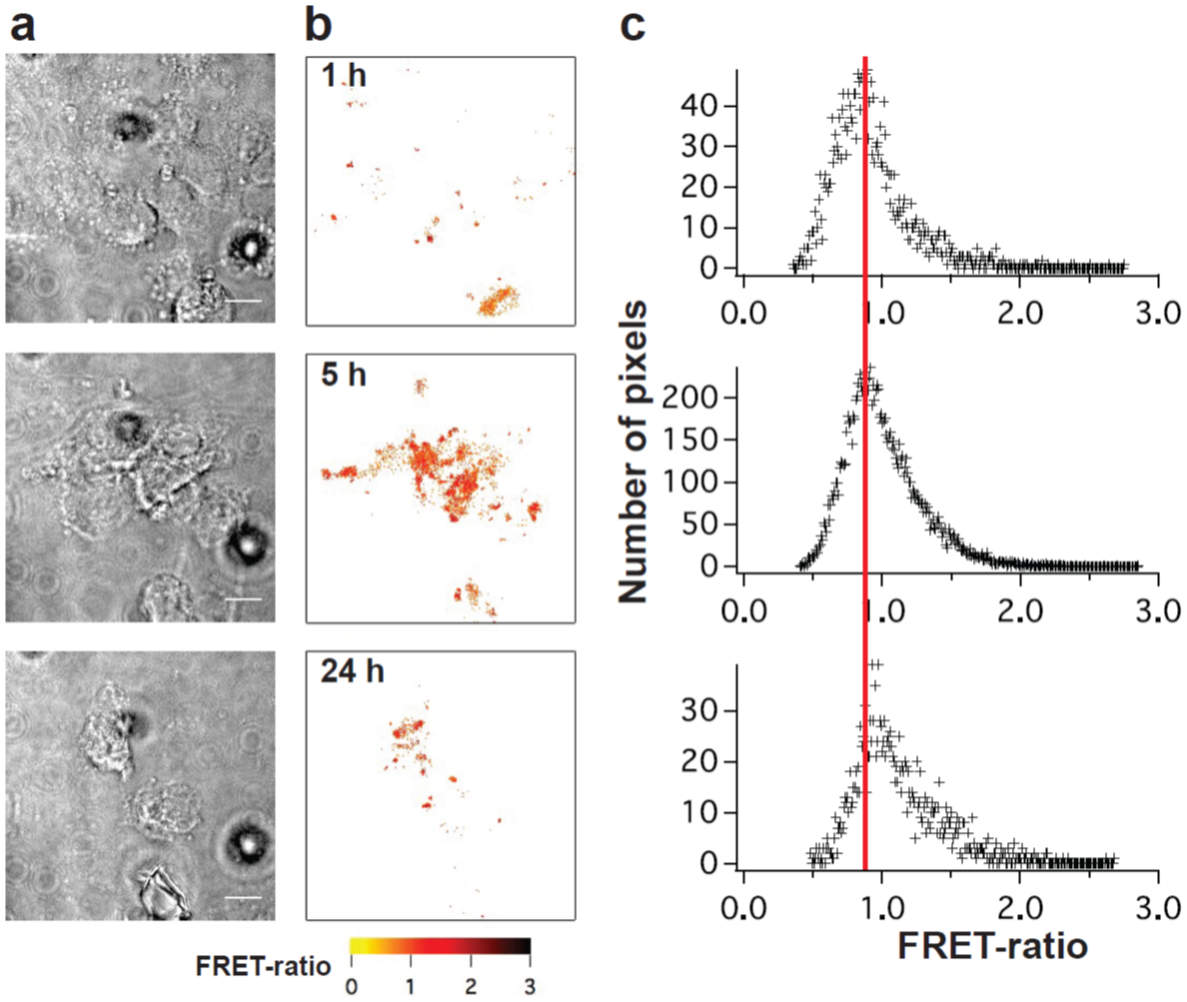

Fig. S4 No loss of FRET was observed for the non-cleavable control particles after uptake into HeLa cells. (a) Bright field images of cells incubated with silica particles that were labeled with a non-cleavable FRET-pair. The ratio donor:acceptor was kept 1:10. (b) FRET images of cells shown in (a) with FRET-level on silica particles color coded from yellow (low) to black (high). (c) Histograms of FRET-ratio per pixel of adjacent images shown in (b). Scale bars in (a) are also representative for (b) and are 10 µm.