SUPPORTING INFORMATION

Accompanying the article

Optically Stable Biocompatible Flame-Made SiO_2-Coated Y_2O_3:Tb^{3+} Nanophosphors for Cell Imaging

Georgios A. Sotiriou[1§], Davide Franco[2§], Dimos Poulikakos[2], and Aldo Ferrari[2]*

[1]Particle Technology Laboratory, Institute of Process Engineering

[2]Laboratory of Thermodynamics in Emerging Technologies, Institute of Energy Technology Department of Mechanical and Process Engineering; ETH Zurich, Sonneggstrasse 3, 8092 Zurich, Switzerland

[§] Contributed equally to this work

*corresponding author: Dr. Georgios A. Sotiriou, sotiriou@ptl.mavt.ethz.ch

The presence of SiO_2 coating inhibits the agglomerate formation of the dispersed nanoparticles in biological relevant media (e.g. PBS), in which the biofunctionalization takes place. Figure S1 shows the hydrodynamic particle size distribution of the uncoated (green line) and SiO_2-coated Y_2O_3:Tb^{3+} nanophosphors (red line) in PBS. The agglomerate size of the SiO_2-coated nanophosphors is significantly smaller than that of the uncoated nanophosphors, further verifying that the presence of SiO_2 coating inhibits nanoparticle agglomeration, in agreement with the literature.[1,2]

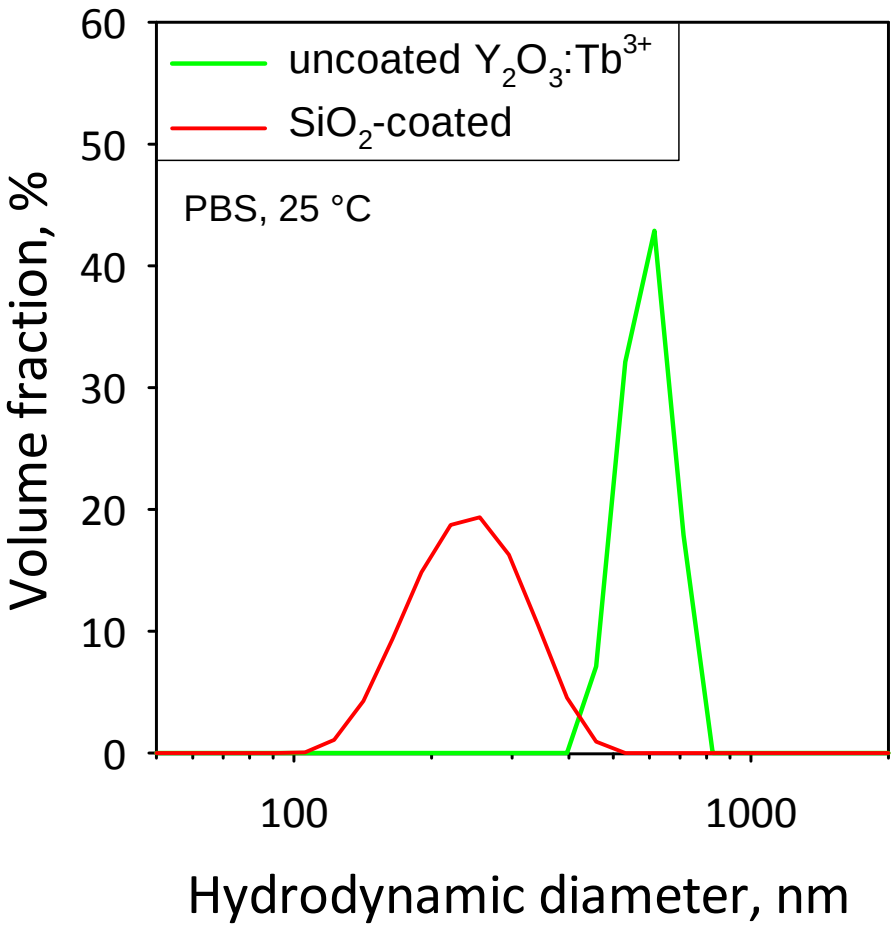

Figure S1: The hydrodynamic diameter of the uncoated (green line) and SiO_2-coated Y_2O_3:Tb^{3+} nanophosphors (red line) in phosphate buffer saline (PBS) solution, measured at 25 °C. Note that the presence of the SiO_2 coating inhibits the agglomerate formation.

Figure S2 shows representative wide-field fluorescent images of mouse VE11 melanoma cells immunostained to reveal the expression of the EGF receptor (EGFR). The images display a dotted bright emission at the cell membrane (middle row). Interestingly, multinucleate cells (i.e. syncytia), which are typically formed by malignant melanoma strains, show the highest EGFR expression.

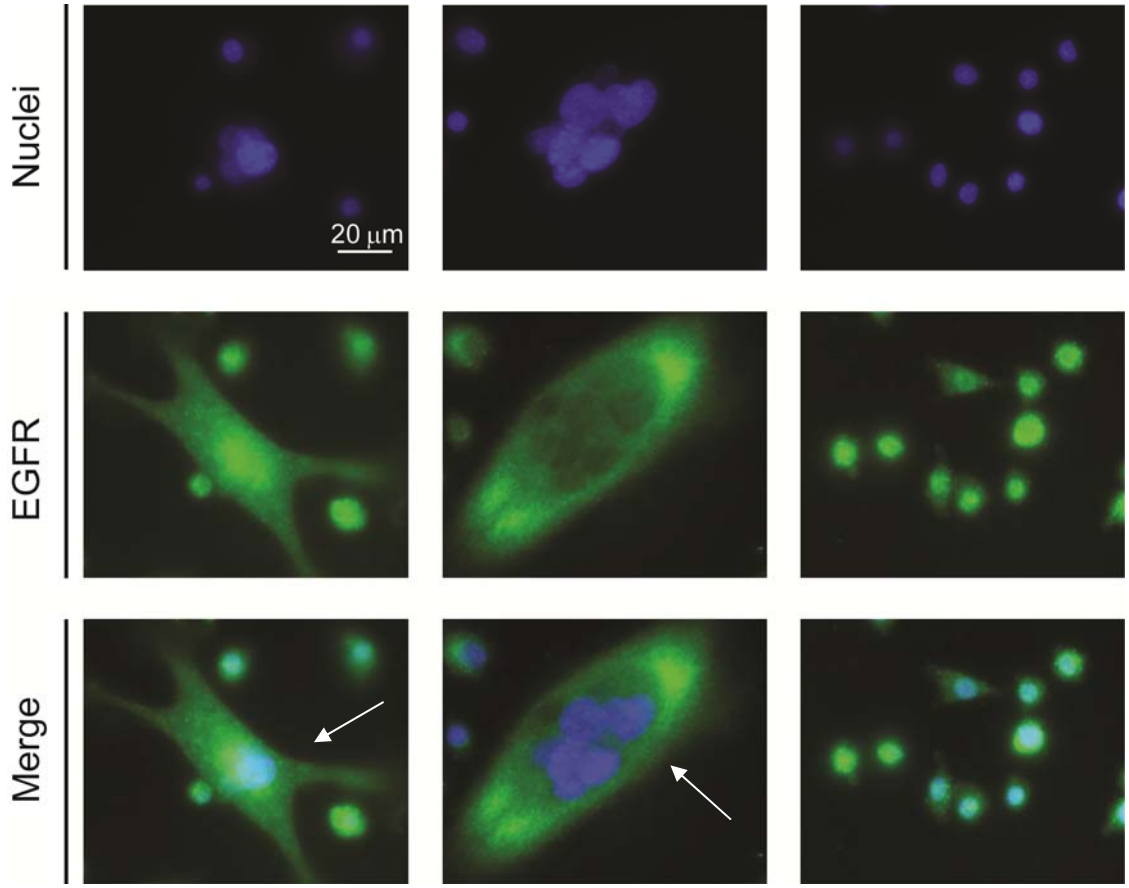

Figure S2: EGFR expression in VE11 melanoma cells. Representative wide-field fluorescent images of VE11 cells showing the cell nuclei (upper row) and the membrane EGFR (middle row). A merged view of the two channels is presented in the lower row. Note the presence of large multinucleated syncytia (indicated by white arrows).

References

1. Sotiriou, G. A.; Hirt, A. M.; Lozach, P. Y.; Teleki, A.; Krumeich, F.; Pratsinis, S. E. Hybrid, silica-coated, Janus-like plasmonic-magnetic nanoparticles. *Chem. Mater.* **2011,** *23*, 1985-1992.
2. Sotiriou, G. A.; Sannomiya, T.; Teleki, A.; Krumeich, F.; Vörös, J.; Pratsinis, S. E. Non-toxic dry-coated nanosilver for plasmonic biosensors. *Adv. Funct. Mater.* **2010,** *20*, 4250-4257.