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Supporting Information

Biotin-decorated silica coated PbS nanocrystals emitting in the second biological near infrared window for bioimaging

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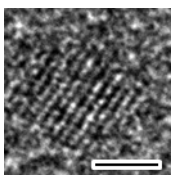

Figure S1: HRTEM micrograph of PbS NCs (scale bar = 2nm).

HRTEM analysis has been carried out by a Jeol 2200FS microscope with spherical aberration-corrected objective lens, equipped with a Field Emission Gun (FEG) and working at an acceleration voltage of 200 kV. The HRTEM micrograph has been recorded by a Gatan Ultrascan 1000 CCD camera.

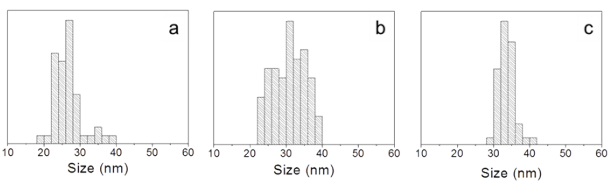

Figure S2: Size distribution histograms of PbS@SiO_2 samples prepared with 700 µL of Igepal, 400 µL of ammonia, 30 µL of TEOS achieving a PbS NC concentration of $6.1 \cdot 10^{-6}$ M (a) and $9.5 \cdot 10^{-6}$ M (b). Size distribution histogram of PbS@SiO_2 sample prepared with 700 µL of Igepal, 400 µL of ammonia, 80 µL of TEOS, achieving a PbS NC concentration of $6.1 \cdot 10^{-6}$ M (c).

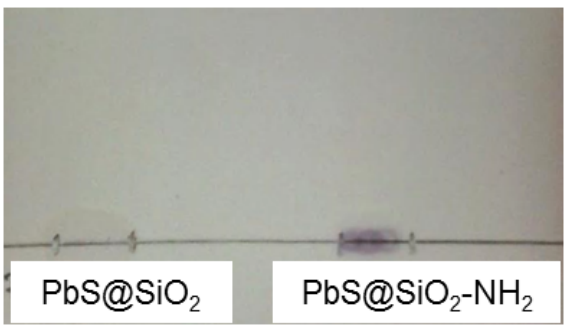

Figure S3: TLC plate with deposited drops of and amine-functionalized silica PbS NPs after spaying the ninhydrin/2,6-lutidine solution in acetone.

The presence of the amine groups onto silica coated PbS NP surface after functionalization by means of APS has been detected by performing a thin layer chromatography (TLC) analysis and using a suitable ninhydrin solution. In particular, a ninhydrin test has been here suitably employed for the characterization of amine-functionalized silica coated NPs[1]. The ninhydrin solution has been preliminary prepared by dissolving 110 mg of ninhydrin in 16 mL of acetone (0.68% w/v) and adding 4 mL of 2,6-lutidine. For the qualitative TLC analysis, a drop of the amine functionalized PbS@SiO_2 NP solution has been loaded on the TLC plate and sprayed with the ninhydrin solution. The presence of amino groups has been confirmed by the formation of a blue coloured spot ascribed to the Ruhemanns by-product (Figure S2).

Table S1. Hydrodynamic diameter (Size), polydispersity (PDI) and ζ-potential of PbS@SiO_2 NPs, biotinylated PbS@SiO_2 NPs (PbS@SiO_2/biotin NPs) and biotinylated PbS@SiO_2 NPs functionalized with streptavidin-FITC (PbS@SiO_2/biotin/streptavidin NPs).

	Size (nm)	PDI	ζ-potential (mV)
PbS@SIO_2 NPs	36±2	0.27±0.02	-29.5±0.8
PbS@SIO_2/biotin NPs	41±3	0.34±0.02	-22.7±0.3
PbS@SIO_2/biotin/streptavidin NPs	48±1	0.22±0.01	-28.4±0.4

Notes and references

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1. N. Depalo, L. Catucci, A. Mallardi, A. Corcelli, A. Agostiano, *Bioelectrochemistry*, 2004, **63**, 103.

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