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@SiO2 samples prepared with 700 µL of Igepal, 400 µL of ammonia, 30 µL of TEOS achieving a PbS NC concentration of 6.1·10⁻⁶ M (a) and 9.5·10⁻⁶ M (b). Size distribution histogram of PbS@SiO2 sample prepared with 700 µL of Igepal, 400 µL of ammonia, 80 µL of TEOS, achieving a PbS NC concentration of 6.1·10⁻⁶ M (c).

Figure S3: TLC plate with deposited drops of and amine-functionalized silica PbS NPs after spraying 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 NPs1. 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@SiO2 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).

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<thead>
<tr>
<th></th>
<th>Size (nm)</th>
<th>PDI</th>
<th>ζ-potential (mV)</th>
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</thead>
<tbody>
<tr>
<td>PbS@SiO$_2$ NPs</td>
<td>36±2</td>
<td>0.27±0.02</td>
<td>-29.5±0.8</td>
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<td>PbS@SiO$_2$/biotin NPs</td>
<td>41±3</td>
<td>0.34±0.02</td>
<td>-22.7±0.3</td>
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<tr>
<td>PbS@SiO$_2$/biotin/streptavidin NPs</td>
<td>48±1</td>
<td>0.22±0.01</td>
<td>-28.4±0.4</td>
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Notes and references

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