Supporting Information

Visible light sensitized attapulgite-based lanthanide composites: microstructure, photophysical behaviour and biological application

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Table S1 Elemental Analysis of Matrix-APTES and Matrix-APMDES Samples

<table>
<thead>
<tr>
<th>Materials</th>
<th>C (%)</th>
<th>H (%)</th>
<th>N (%)</th>
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</thead>
<tbody>
<tr>
<td>Atta-APTES</td>
<td>7.36</td>
<td>2.06</td>
<td>2.02</td>
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<tr>
<td>Atta-APMDES</td>
<td>6.28</td>
<td>2.04</td>
<td>1.33</td>
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<tr>
<td>SiO₂-APTES</td>
<td>6.4</td>
<td>1.65</td>
<td>1.94</td>
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<tr>
<td>SiO₂-APMDES</td>
<td>5.02</td>
<td>1.38</td>
<td>1.18</td>
</tr>
</tbody>
</table>

Fig. S1 TG curves of Matrix-cpa-Eu(DBM)$_3$ samples.
Cell incubation and imaging

Cell culture:
HeLa cells (5×10^5 cells/mL) were maintained in Dulbecco’s minimum Essential medium (DMEM HyClone) supplemented with 10% fetal bovine serum (FBS, Gibco) and incubated in 5% CO₂ at 37 °C humidified atmosphere.

Cell bioimaging:
HeLa cells were plated in a flat-bottom 6-well plate (Costar) in 2mL culture medium and incubated in 5% CO₂ at 37 °C. After overnight incubation, the cells were treated with atta-based and silica-based composites with the end concentration 100 μg/mL for 1h and washed three times with phosphate buffered saline (PBS). Then the fluorescence imaging of cell membrane was observed under excitation at 340-380 nm (Zeiss Leica DM 4000B microscope).

Cell viability:
This was determined by (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl-tetra-zolium bromide (MTT, Amresco 0793) assays on HeLa cells under normal physiological conditions (i.e., at pH 7.2–7.4). HeLa cells (1×10^4 cells/well) were plated in a flat-bottom 96-well plate (Costar) in 200μL culture medium and incubated overnight. Then the composites were added, with final concentrations of 25, 50, 75, 100, 125, 200 and 300 μg/mL. The plate was further incubated for 24 h and then the cells were washed with PBS three times. The MTT reagent (5 mg/mL) was then added to each well (20 μL/well) and incubated for 4h. Then the medium was removed and the absorbance was measured using a Perkin Elmer VICTOR3 1420 Multilabel Plate Reader at 490 nm. The relative cell viability (mean% ± SD, n = 3) was expressed as Abs composites/Abs control ×100%. 

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**Fig. S2** TEM images of Atta-APTES-cpa-Eu(DBM)$_3$.

**Fig. S3** Luminescence decay curves of Matrix-cpa-Eu(DBM)$_3$ samples.