

## Supporting Information

### Functionalisation of Carbon Nanohorns

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#### Experimental section.

**Techniques.** Raman spectra were recorded using an in Via Renishaw Raman spectrometer at 488 and 633 nm exciting lines. UV-Vis-NIR spectra were recorded on a Varian Cary 5000 UV-Vis-NIR spectrophotometer. FTIR spectra were recorded on a Jasco FT/IR-200 spectrometer. The thermogravimetric analyses were performed with a TGA Q500 TA Instruments at 10°C/min under N<sub>2</sub>. For the TEM and SEM analyses: a small amount of nanohorns was dissolved in DMF and a drop of the solution was placed on holey carbon grids (for TEM) or on glass substrate (for SEM). After air-drying the sample was investigated with a Philips EM 208 (TEM), accelerating voltage of 100 kV and with a Leica Stereoscan 430i (SEM)

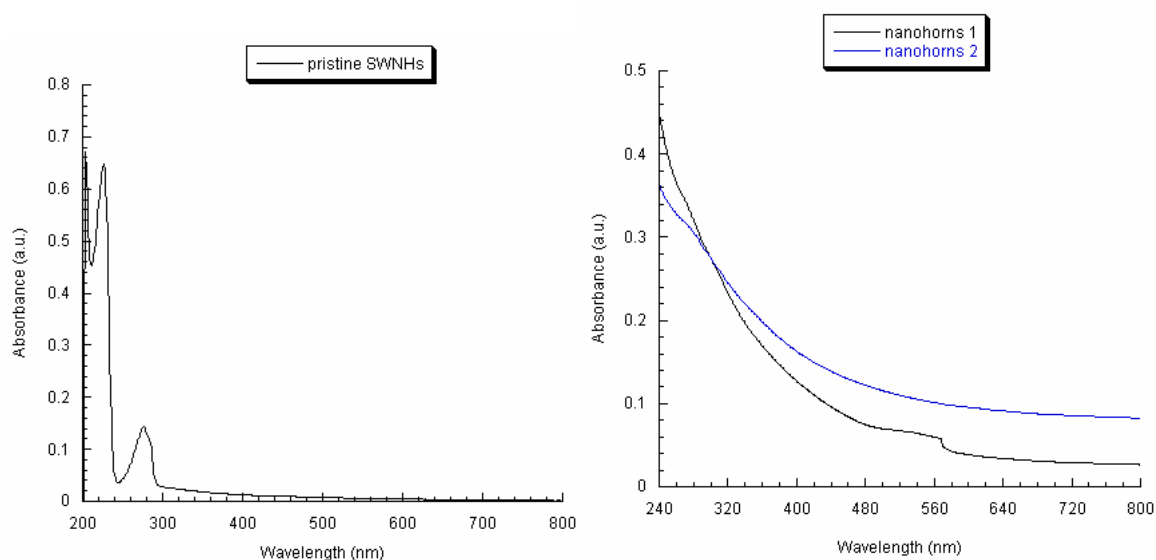
**Compound 1.** A suspension of SWNHs (80 mg) in DMF (100 ml) was sonicated for 10 min, sarcosine **3** (750 mg, 8.42 mmol) and heptanal (0.300 ml, 2.14 mmol) were added in portions

(0.1 mL of heptanal and 250 mg of sarcosine every 24 hours). The resulting mixture was refluxed for 4 days at 130°C. After cooling to room temperature, the suspension was centrifugated. The brown solution was conserved and the black solid was washed several times with fresh DMF until the supernatant solution remained colorless. All the DMF solutions were assembled and evaporated to dryness. After addition of water (50 mL), the solution was extracted with CHCl<sub>3</sub> (3 × 100 ml), dried with anhydrous Na<sub>2</sub>SO<sub>4</sub> and then the solvent was removed. A solid residue was obtained by precipitation (dissolution in CH<sub>2</sub>Cl<sub>2</sub> and precipitation by addition of diethyl ether), the solid was washed several times with THF to remove the by-products. After drying under vacuum, nanohorns **1** were obtained as a black powder (10 mg). IR-DRIFT (KBr):  $\nu$  (cm<sup>-1</sup>) 2962, 2921, 2861, 1712, 1642, 1453, 1100.

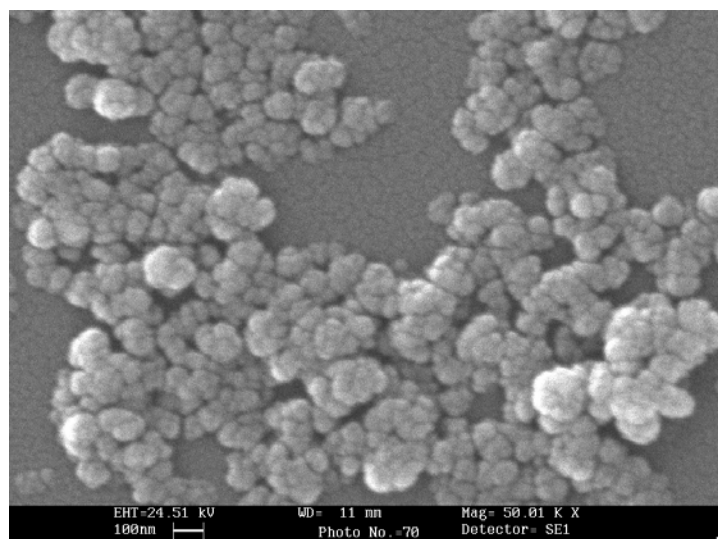
**Compound 2.** A suspension of SWNHs (80 mg) in DMF (100 ml) was sonicated for 10 min, amino acid **4**<sup>1</sup> (360 mg, 1.189 mmol) and paraformaldehyde (540 mg, 18.00 mmol) were added in portions (120 mg of **4** and 180 mg of paraformaldehyde every 24 hours). The resulting mixture was refluxed for 4 days at 130°C. After cooling to room temperature, the suspension was centrifugated. The brown solution was conserved and the black solid was washed several times with fresh DMF until the supernatant solution remained colorless. All the DMF solutions were assembled and evaporated to dryness. After addition of water (50 mL), the solution was extracted with CHCl<sub>3</sub> (3 × 100 ml), dried with anhydrous Na<sub>2</sub>SO<sub>4</sub> and then the solvent was removed. A solid residue was obtained by precipitation (dissolution in CH<sub>2</sub>Cl<sub>2</sub> and precipitation by addition of diethyl ether), the solid was washed several times with THF to remove the by-products. After drying under vacuum, nanohorns **2** were obtained as a black powder (4.4 mg). IR-DRIFT (KBr):  $\nu$  (cm<sup>-1</sup>) 2954, 2915, 2860, 1716, 1651, 1455, 1257, 1167.

**Compound 5.** To a suspension of **2** (3 mg) in chloroform (10 ml) was added trifluoroacetic acid (10 ml); the nanohorns immediately initiated to precipitate. The reaction mixture was stirred at room temperature for 12h. then filtered on a 0.2  $\mu\text{m}$  Millipore membrane and washed with chloroform and diethyl ether. After drying under vacuum, nanohorns **5** were obtained as a black powder (2.2 mg). IR-DRIFT (KBr):  $\nu$  ( $\text{cm}^{-1}$ ) 2916, 2849, 1682, 1203, 1133.

### Characterisation.



**Figure S1.** UV-Vis. spectra of the pristine SWNHs in water with Triton<sup>®</sup>-X100 as surfactant (left) and of nanohorns **1** and **2** in chloroform (right).



**Figure S2.** SEM image of pristine SWNHs