

## **Supplementary Materials**

**Sara Cavaliere-Jaricot, Masih Darbandi, Thomas Nann**

Freiburg Materials Research Centre, Albert-Ludwig University Freiburg., Stefan-Meier-Strasse 21, D-79104, Freiburg,  
Germany

School of Chemical Sciences and Pharmacy, University of East Anglia (UEA), Norwich NR4 7TJ, UK

## Synthesis of Au@SiO<sub>2</sub> nanocomposites

Au@SiO<sub>2</sub> nanocomposites were prepared in a two-step process. First, hollow silica particles were formed starting from SiO<sub>2</sub> encapsulated quantum dots and then, they were used as reactors to prepare the gold encapsulated composites. In a typical synthesis, to as prepared CdSe/ZnS@SiO<sub>2</sub><sup>1</sup>, 1 mL of HNO<sub>3</sub> (>69.5%, from Fluka) was added. The mixture was sonicated in an ultra-sonic bath for 30 minutes and then the white product, no more photoluminescent, was precipitated and washed respectively with butanol, propanol, ethanol and water. It was finally redispersed in 400 μL of water and reacted with an excess of HAuCl<sub>4</sub> (2 mL of 1% solution, from Aldrich). After 30 minutes of sonication and 2 days of reaction, an excess of reducing agent was added (1 mL of 2M NaBH<sub>4</sub>, from Merck). The red-purple precipitate was washed with water until the supernatant passed from yellow (excess of gold precursor) to colorless.

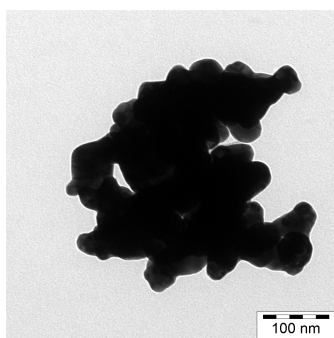


Figure S1. TEM micrograph of the material obtained after reaction of hollow silica nanoparticles in the presence of HAuCl<sub>4</sub> and 1% sodium citrate as a reducing agent instead of NaBH<sub>4</sub>.

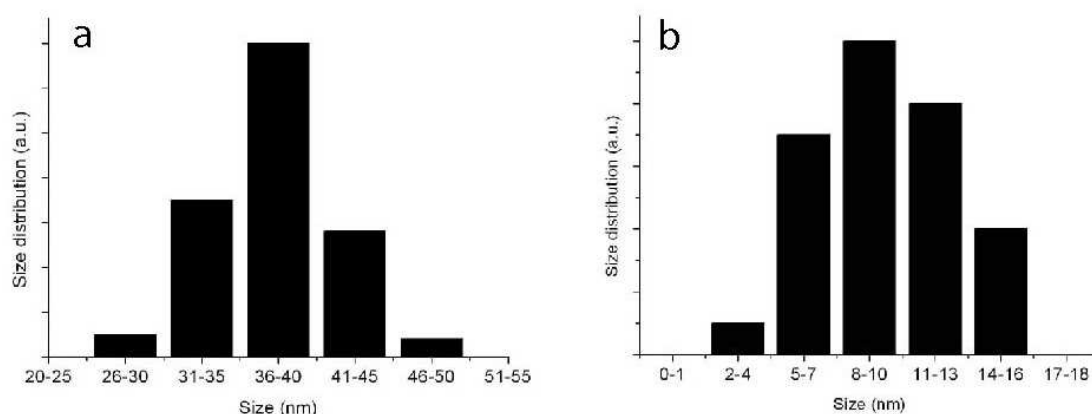


Figure S2. Size distribution histograms of the diameters of the hollow silica nanoparticles (a) and the of the gold cores of the derived nanocomposites (b).