ADVANCED MATERIALS

Supporting Information

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Enhancing the Photothermal Stability of Plasmonic Metal Nanoplates by a Core-Shell Architecture

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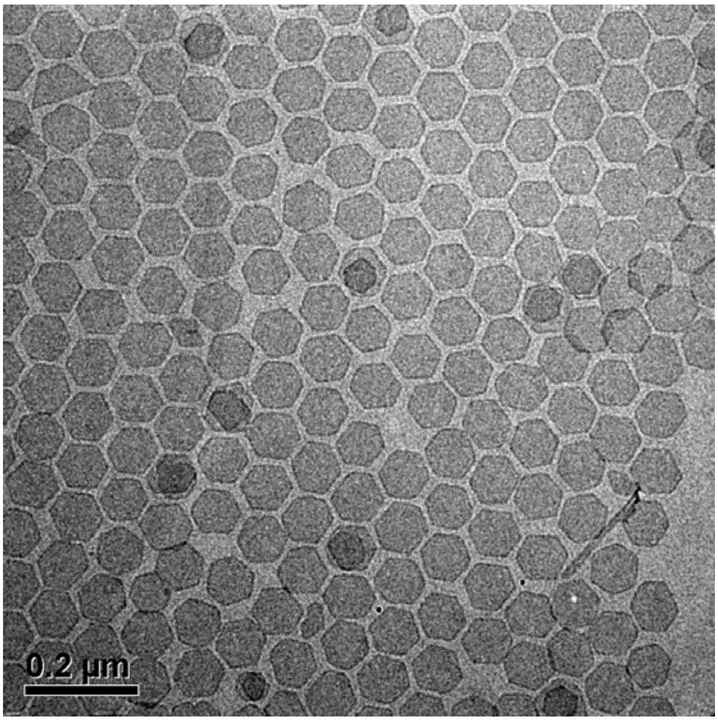

Figure S1. Representative TEM image of the hexagonal Pd nanoplates.

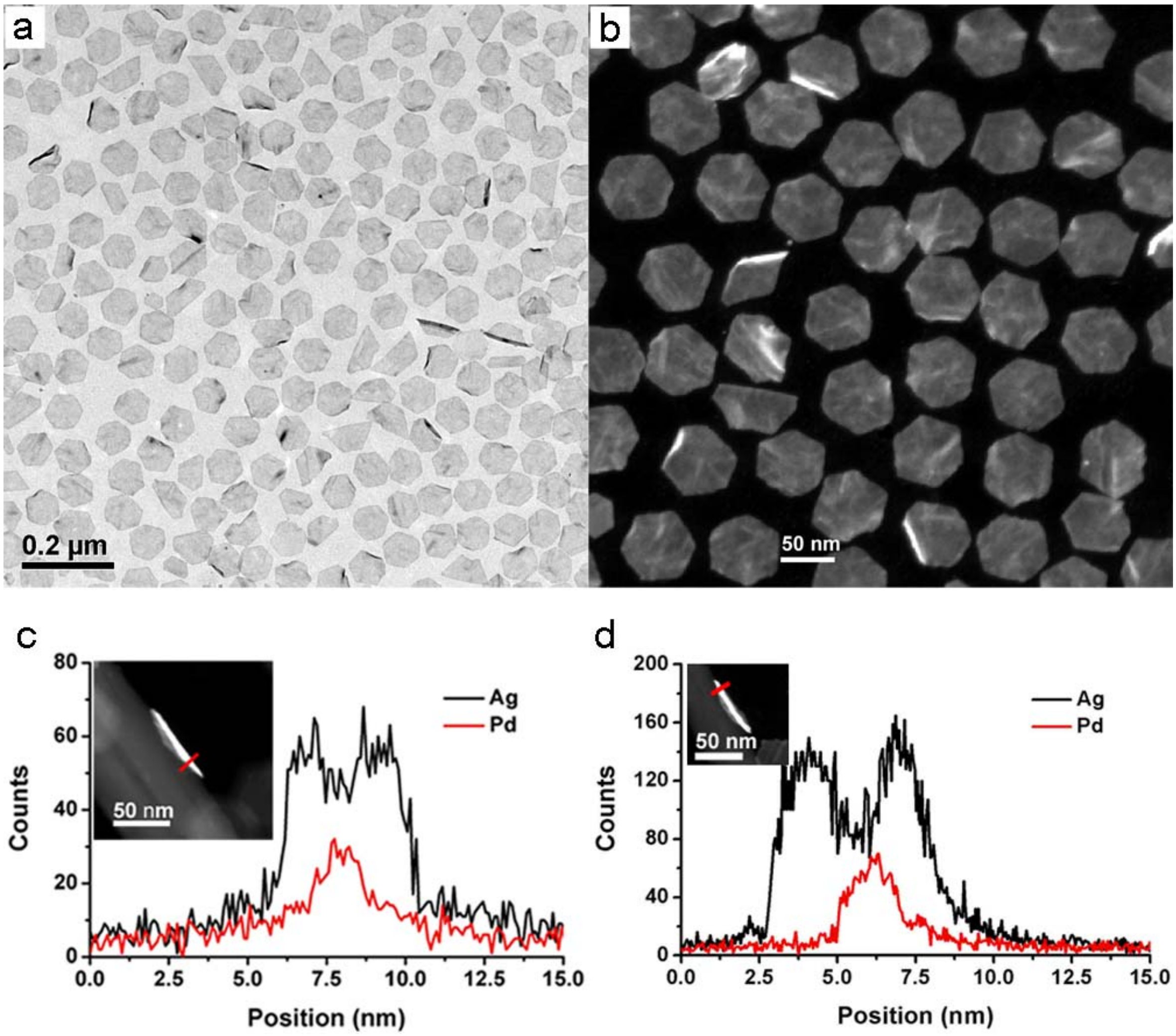

Figure S2. Representative large-area (a) TEM image, (b) HAADF-STEM image of the plasmonic Pd@Ag core-shell bimetallic nanoplates, (c) HAADF-STEM image and EDX line profiles across the side of a Pd@Ag nanoplate and (d) HAADF-STEM image and EDX line profiles across the side of a Pd@Ag nanoplate after irradiation. The Pd@Ag nanoplates have a Ag/Pd molar ratio of 1.8.

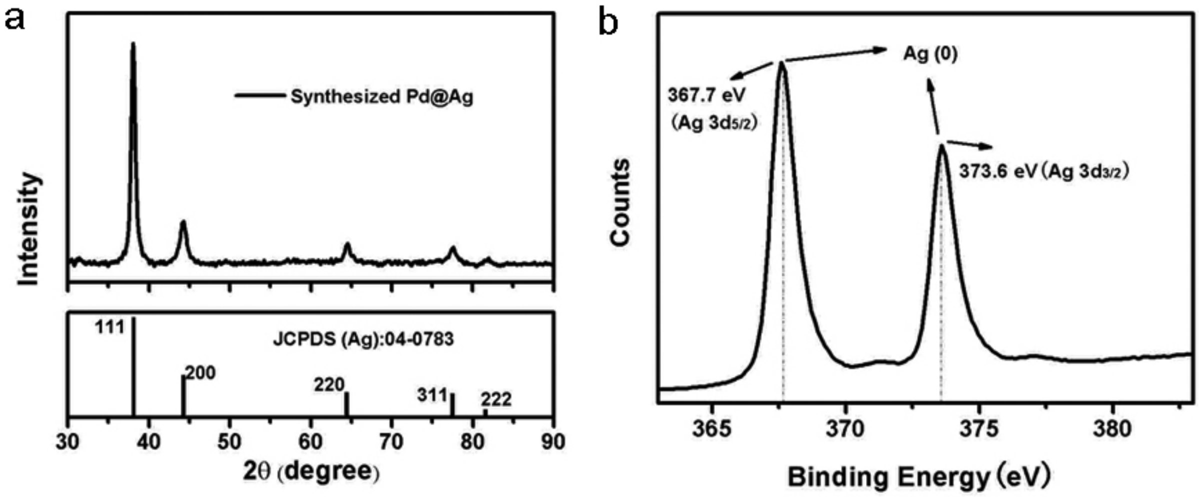

Figure S3. (a) XRD pattern and (b) Ag3d XPS spectrum of the plasmonic Pd@Ag core-shell bimetallic nanoplates. The Pd@Ag nanoplates have a Ag/Pd molar ratio of 1.8.

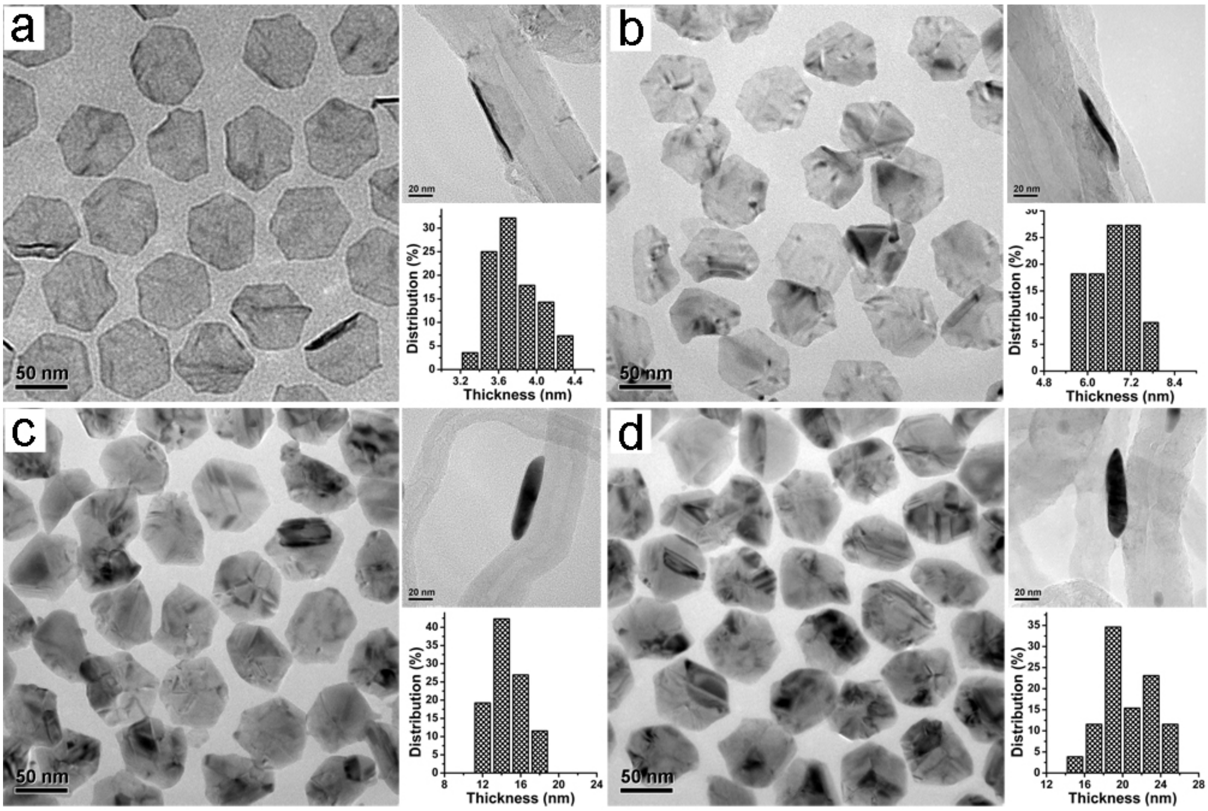

Figure S4. Representative TEM images of the bimetallic nanoplates collected at different $AgNO_3$/Pd nanplates molar ratio: a) 1.8, b) 3.6, c) 7.3, and d) 11. For the direct measurements of the thicknesses, carbon nanotubes were added into ethanol dispersions of the Pd@Ag nanoplates to allow the attachment of the bimetallic nanoplates on the outer surface of the nanotubes (shown at the top-right of each image.). The respective thickness distribution of the Pd@Ag is illustrated at the down-right of each image.

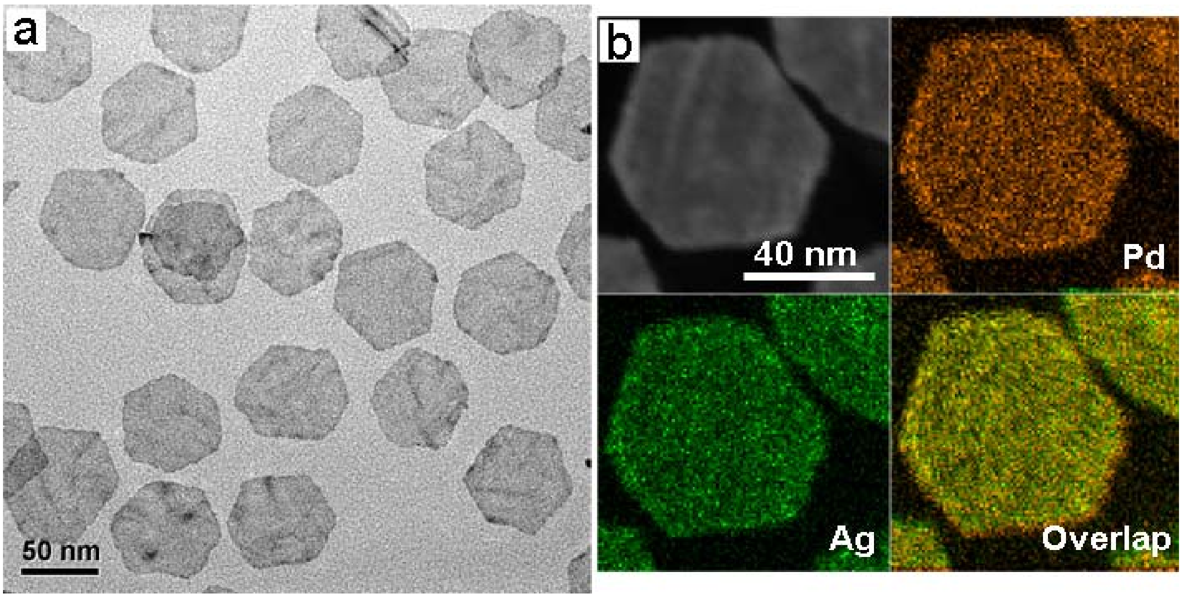

Figure S5. Representative (a) TEM image and (b) EDX maps for Pd and Ag elements of the plasmonic Pd@Ag core-shell bimetallic nanoplates with a Ag/Pd molar ratio of 0.9.

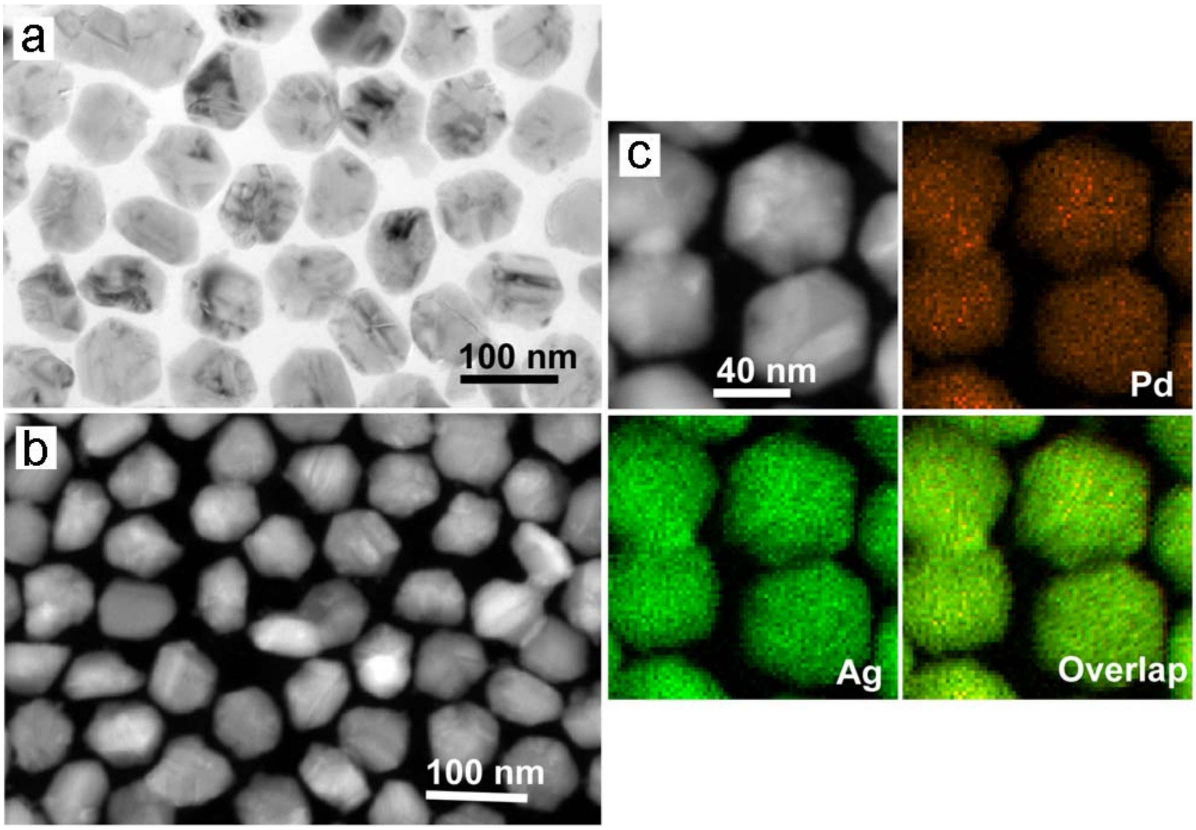

Figure S6. Representative (a) TEM image, (b) HAADF-STEM image and (c) EDX maps for Pd and Ag elements of the plasmonic Pd@Ag core-shell bimetallic nanoplates with a Ag/Pd molar ratio of 11.

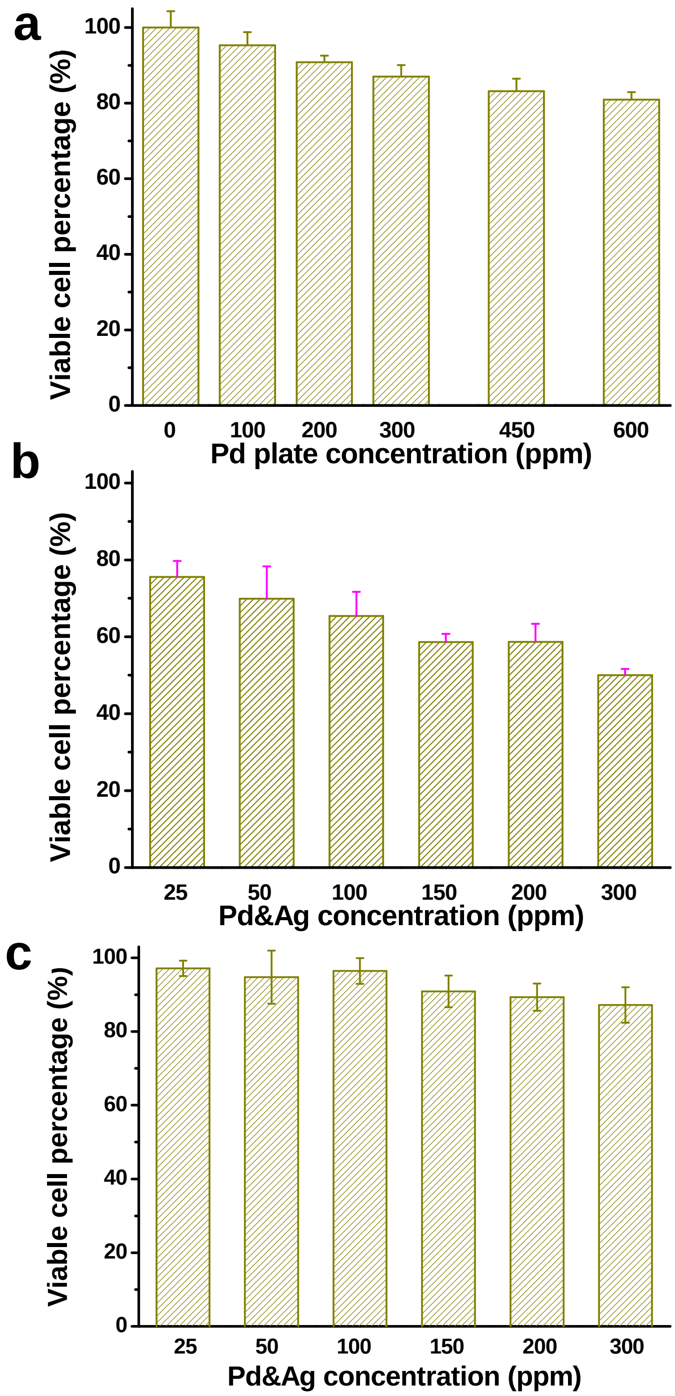

Figure S7. Viability of healthy liver cells incubated for 48 hr with different-concentrations of (a) Pd nanoplates, (b) plasmonic Pd@Ag core-shell bimetallic nanoplates and (c) silica coated plasmonic Pd@Ag core-shell bimetallic nanoplates. The concentrations are the corresponding Pd and Ag contents. The cell viabilities were measured by standard MTT assay. The silica coated Pd@Ag nanoplates have a core thickness of 5.4 nm Pd@Ag nanoplate and a shell thickness of 38 nm silica.

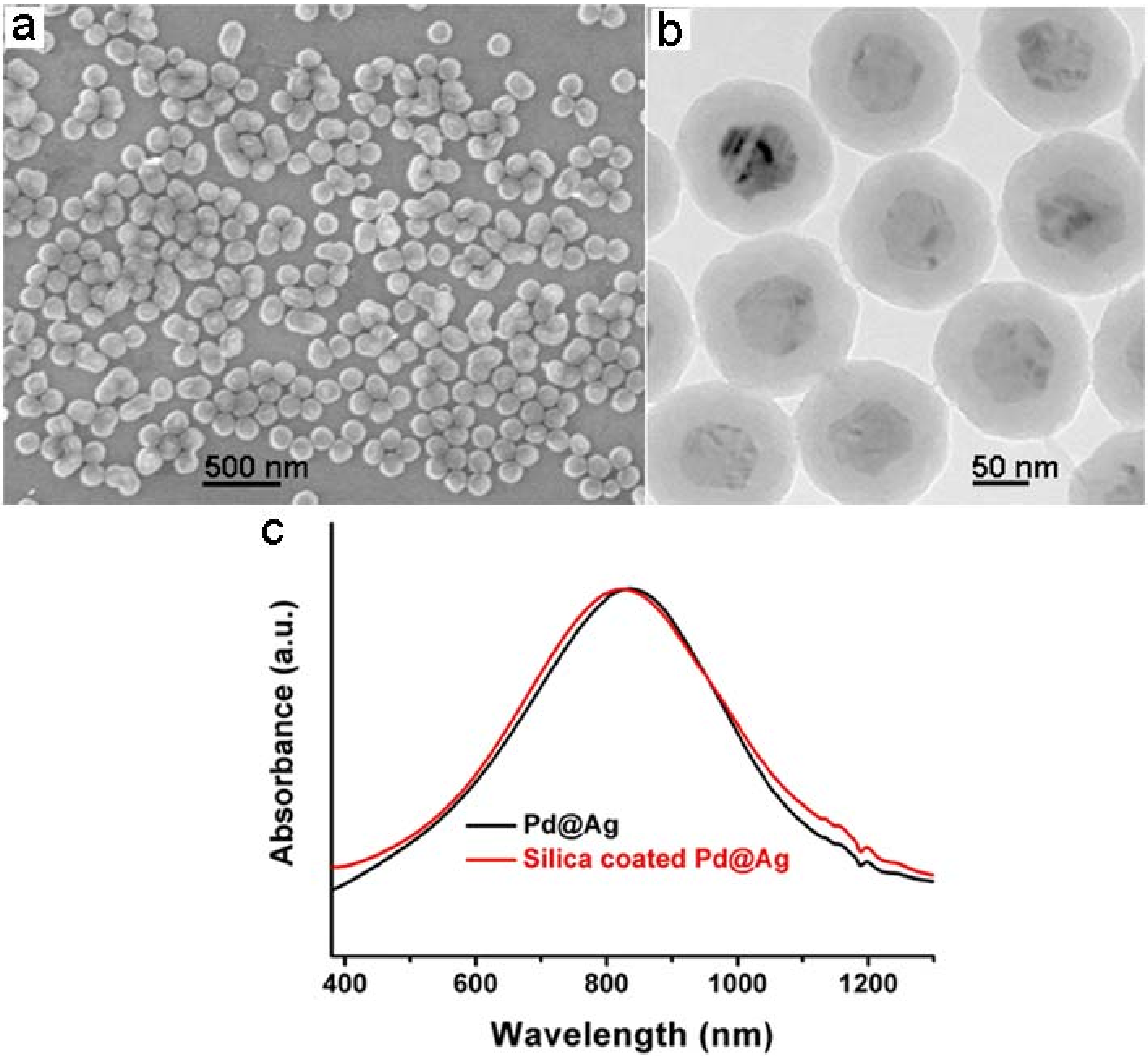

Figure S8. Representative (a) SEM image and (b) TEM image of the silica coated plasmonic Pd@Ag core-shell bimetallic nanoplates. (c) The absorption spectra of plasmonic Pd@Ag core-shell bimetallic nanoplates and corresponding silica coated plasmonic Pd@Ag core-shell bimetallic nanoplates used for the photothermal experiments. The Pd@Ag nanoplates have an Ag/Pd molar ratio of 1.8 and a thickness of 5.4 nm.

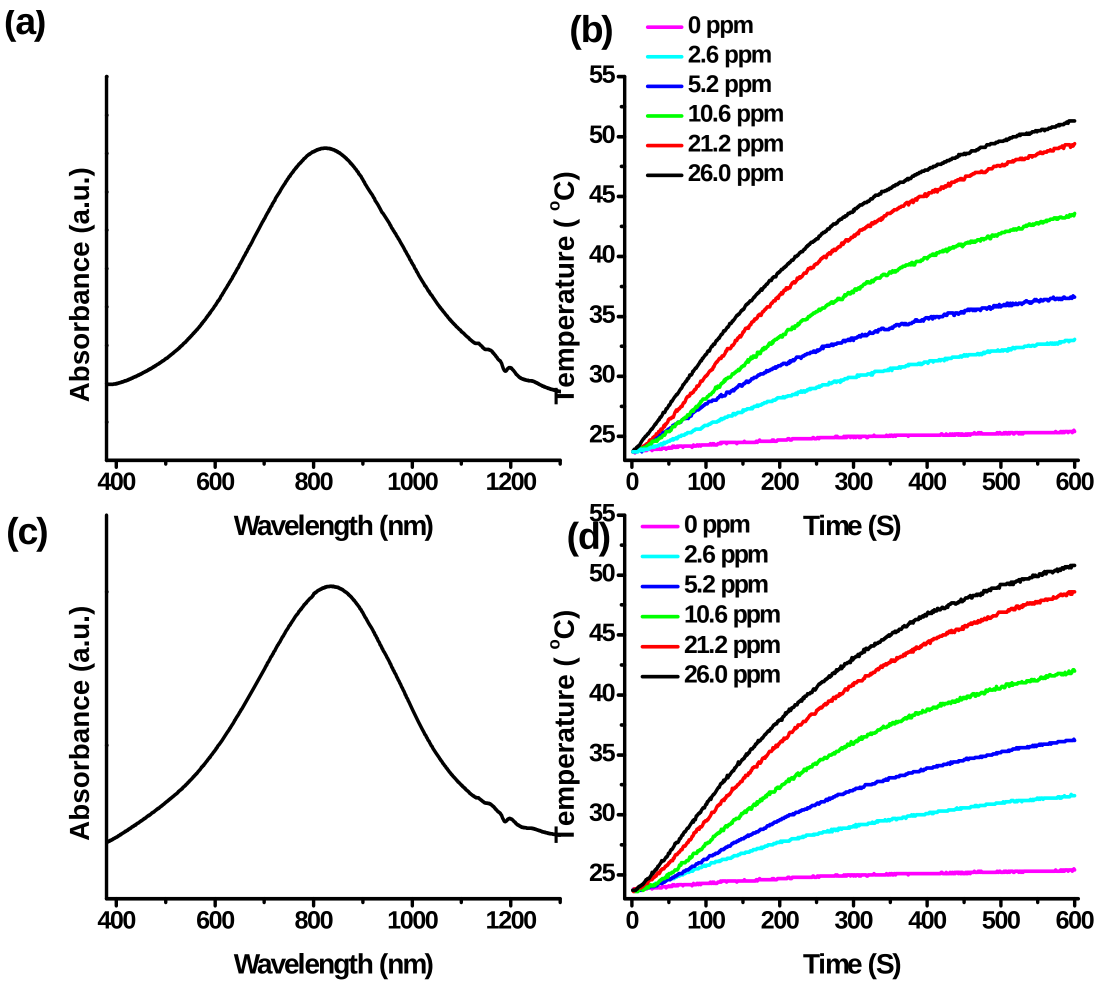

Figure S9. The absorption spectra of plasmonic Pd@Ag core-shell bimetallic nanoplates (a) and corresponding silica coated plasmonic Pd@Ag core-shell bimetallic nanoplates (c) used for the photothermal experiments. Photothermal effect of of plasmonic Pd@Ag core-shell bimetallic nanoplates (b) and corresponding silica coated plasmonic Pd@Ag core-shell bimetallic nanoplates (d). The temperature versus time plots were recorded for various concentrations of Pd@Ag nanoplates on irradiation by a 1 W laser. The silica coated Pd@Ag nanoplates have a core thickness of 5.4 nm Pd@Ag nanoplate and a shell thickness of 38 nm silica. The power density is 1.4 W/cm^2.

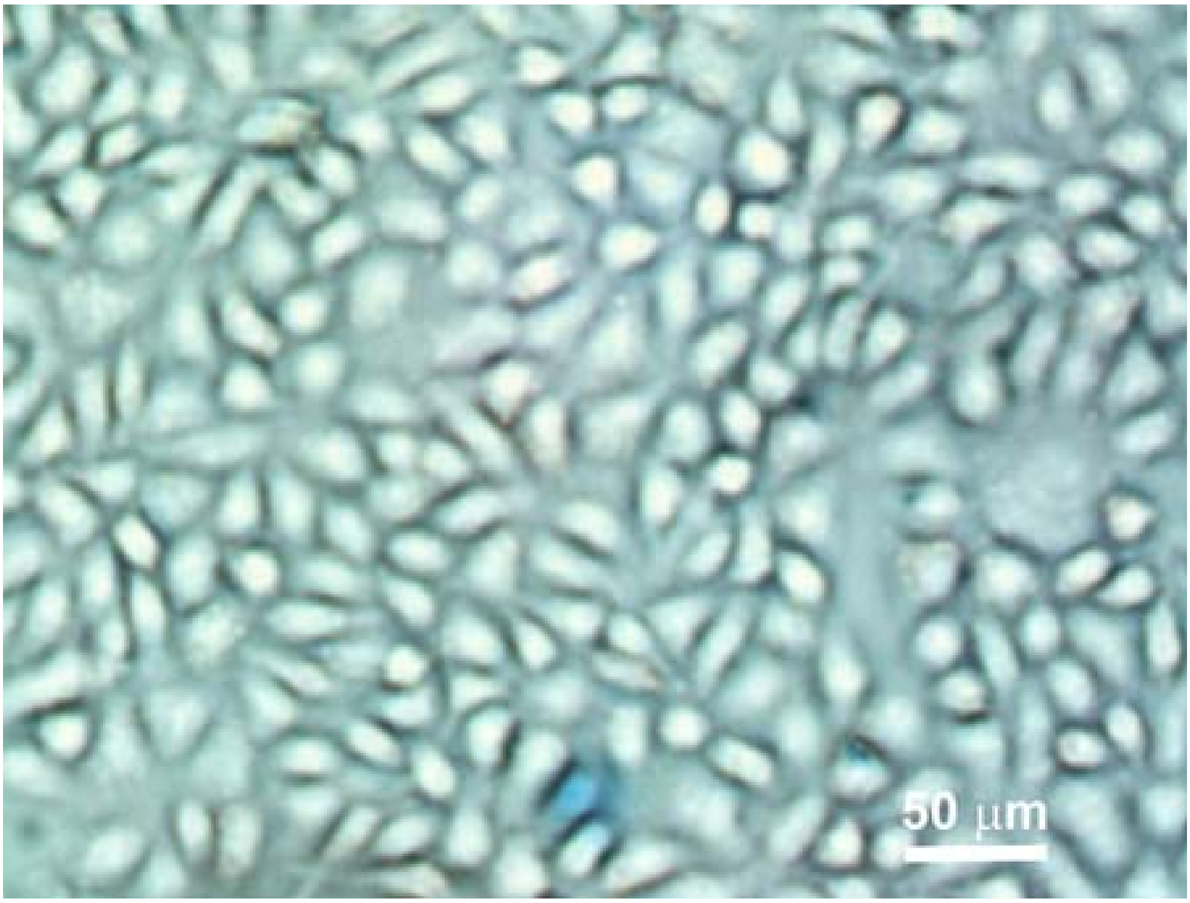

Figure S10. Micrograph of liver cancer cells in the absence of silica coated plasmonic Pd@Ag nanoplates when irradiated alone with a 2 W 808-nm laser (1.4 W/cm^2). Trypan blue was used to stain the dead cells before microscopic evaluation.