Fast Loading of PEG-SH on CTAB-protected Gold Nanorods

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Note added after first publication: This Supplementary Information file replaces that originally published on 14th April 2014. The authors have added the section immediately below to provide details regarding the synthesis.

Critical Steps

1. The gold nanorods were fabricated according to EI-Sayed's method or modified EI-Sayed's method. The gold nanorod should be purified by twice centrifugation to remove the excess CTAB on the nanorod surface. If the nanorod concentration is too low, it is necessary to concentrate 4-6 mL of raw solution into 25 μL before PEGylation.

2. The mPEG-SH (25 μL, 2 mM) and Tris buffer (400 μL, 50 mM) were added into the purified gold nanorods in sequence. **The Tris buffer was made by adding 0.606 g Tris and 0.5-1 mL of SDS (10%) into 100 mL of pure water. The pH was adjusted to 3.0 by 1 M of HCl.**

3. The mixture in the Eppendorf tube (1.5 mL) was shaken for 30 mins for the PEGylation. After the PEGylation, the mixture was centrifuged and re-dispersed in PBS (10 mM, pH 7.48, without NaCl).

Fig. S1 Uv-vis spectra of gold nanorods PEGylated in the 100 mM Tris solution (pH=3.0). The 100 mM of Tris solution (pH=3.0) and mPEG-SH were added to the purified gold nanorods for PEGylation.

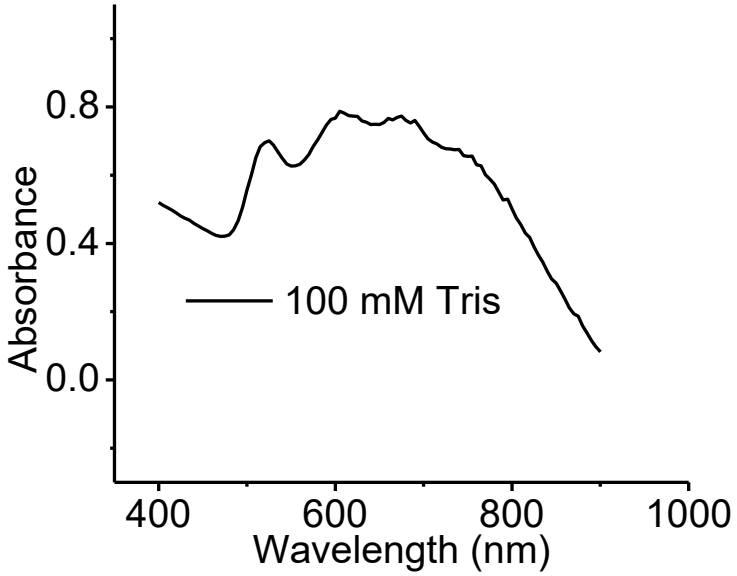

Fig. S2 Uv-vis spectra of CTAB-protected gold nanorods and gold nanorods PEGylated in the 40 mM of citrate buffer (pH=3.0) for 30 min. The yield of PEG-NR was much lower than the proposed methods and aggregations of gold nanorods were observed in the bottom of the tube after the centrifugation.

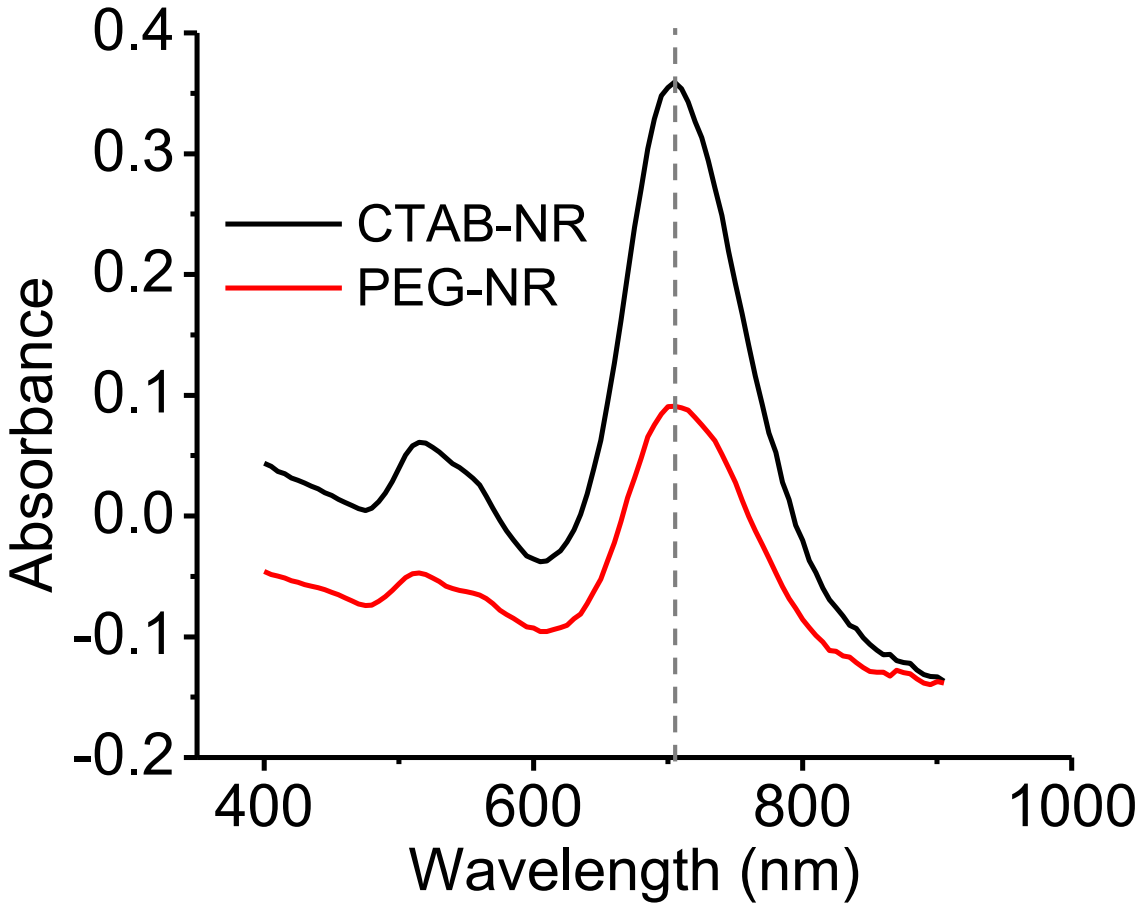

Fig. S3 Raman spectra (average of 5) of CTAB-protected gold nanorods (black line) and the gold nanorods modified by mPEG-SH using the proposed method (blue line): (a) spectra from 600 to 3200 cm^{-1}; (b) enlarged spectra from 630 to 1120 cm^{-1}; and (c) enlarged spectra from 2680 to 3150 cm^{-1}.

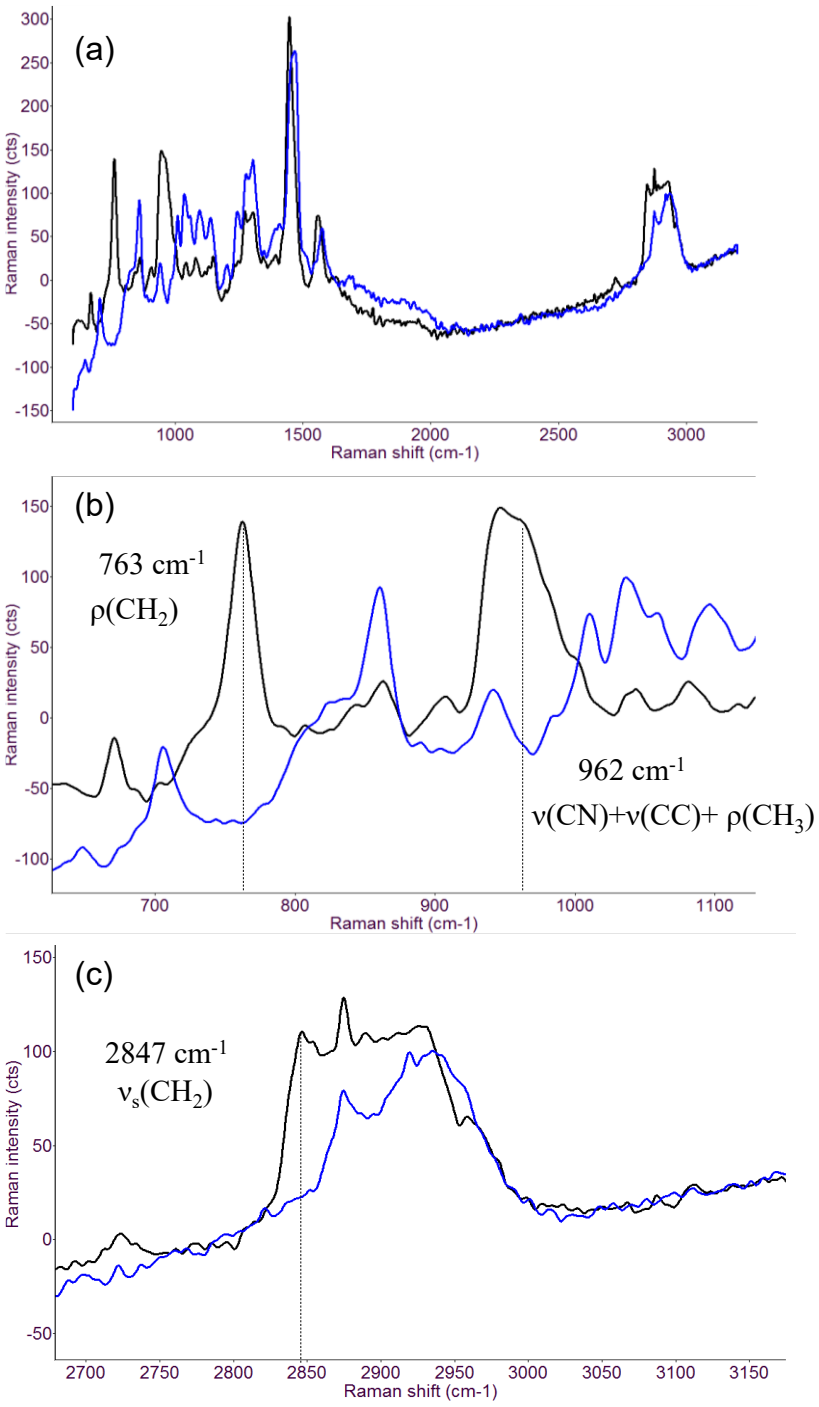

Fig. S4 Uv-vis spectra of PEGylated gold nanorods before and after the third centrifugation.