

## Supporting Information

### Hierarchical Heterostructure of Ag-Nanoparticle Decorated Fullerene Nanorods (Ag-FNRs) as an Effective Single Particle Freestanding SERS Substrate

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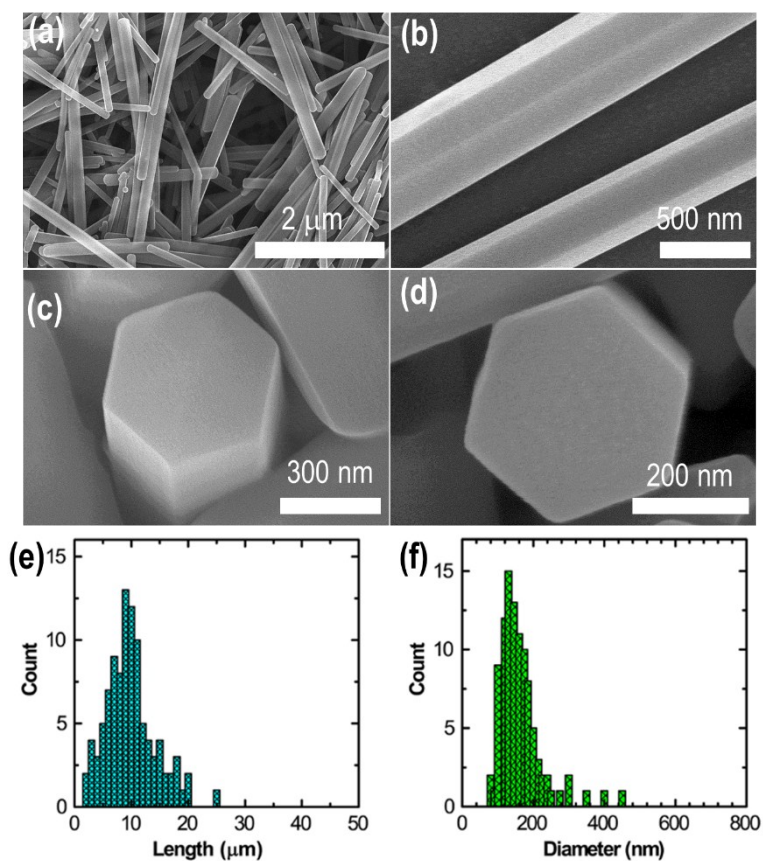
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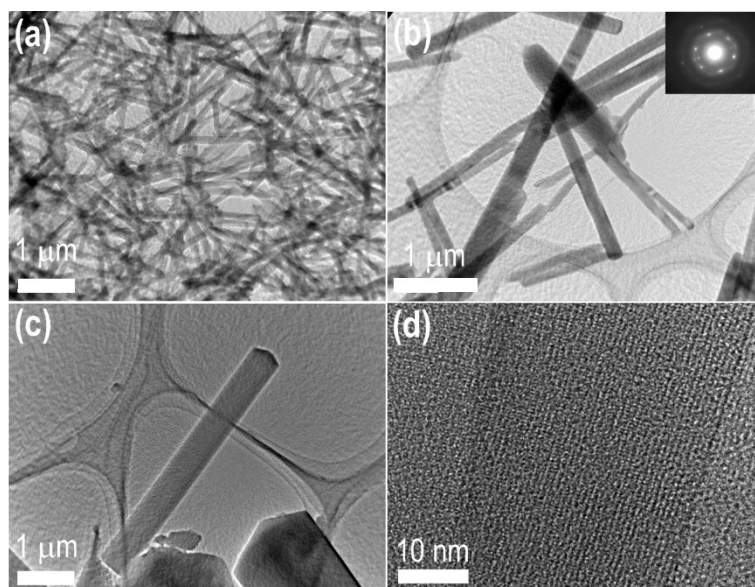
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### 1. Additional SEM images and histograms of length and diameter distributions of FNRs



**Fig. S1** (a – d) SEM images of ultrarapidly grown FNRs, (e) histogram of length distribution of randomly selected 100 FNRs with mean length of  $\sim 11 \mu\text{m}$ , and (f) corresponding diameter distribution with mean diameter of  $\sim 215 \text{ nm}$ .

## 2. Additional TEM images of FNRs



**Fig S2** (a – c) TEM images of ultrarapidly grown FNRs, and (d) HR-TEM image of FNR from the thin edge region. SAED pattern (inset of panel b) indicates the highly crystalline nature of FNRs.

### 3. Additional SEM images of Ag-FNRs

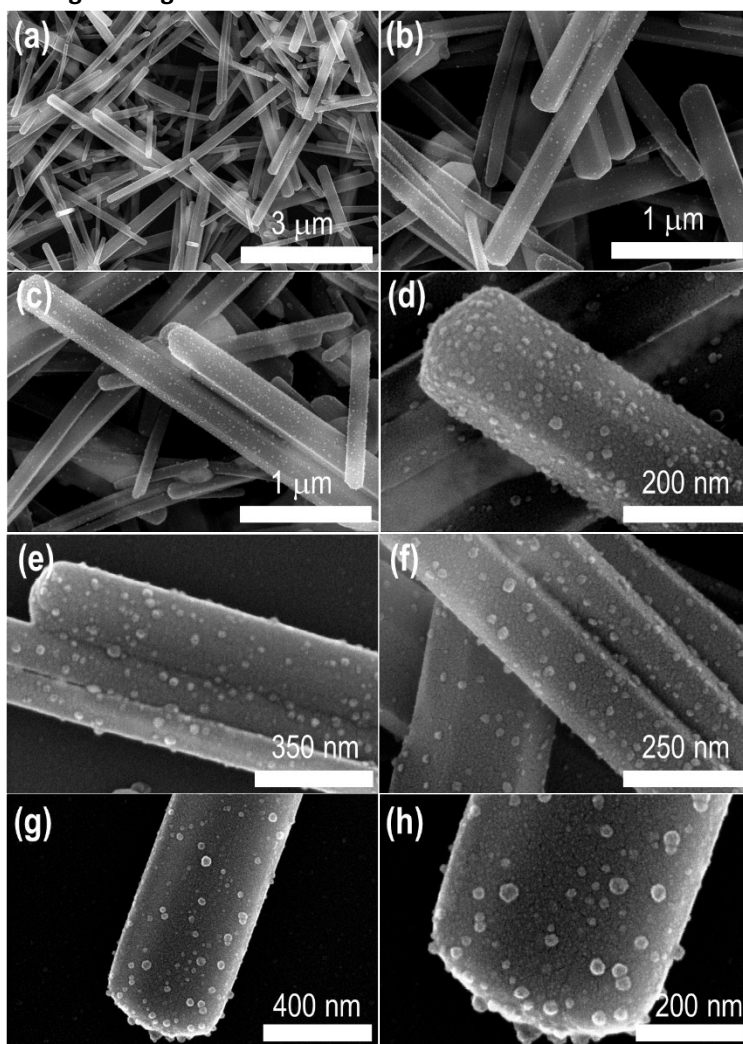


Fig. S3 Additional SEM images of Ag-FNRs.

### 4. Histogram of size distribution of Ag-NP in Ag-FNRs heterostructure

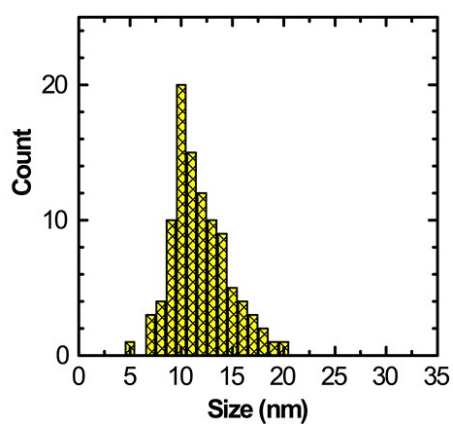
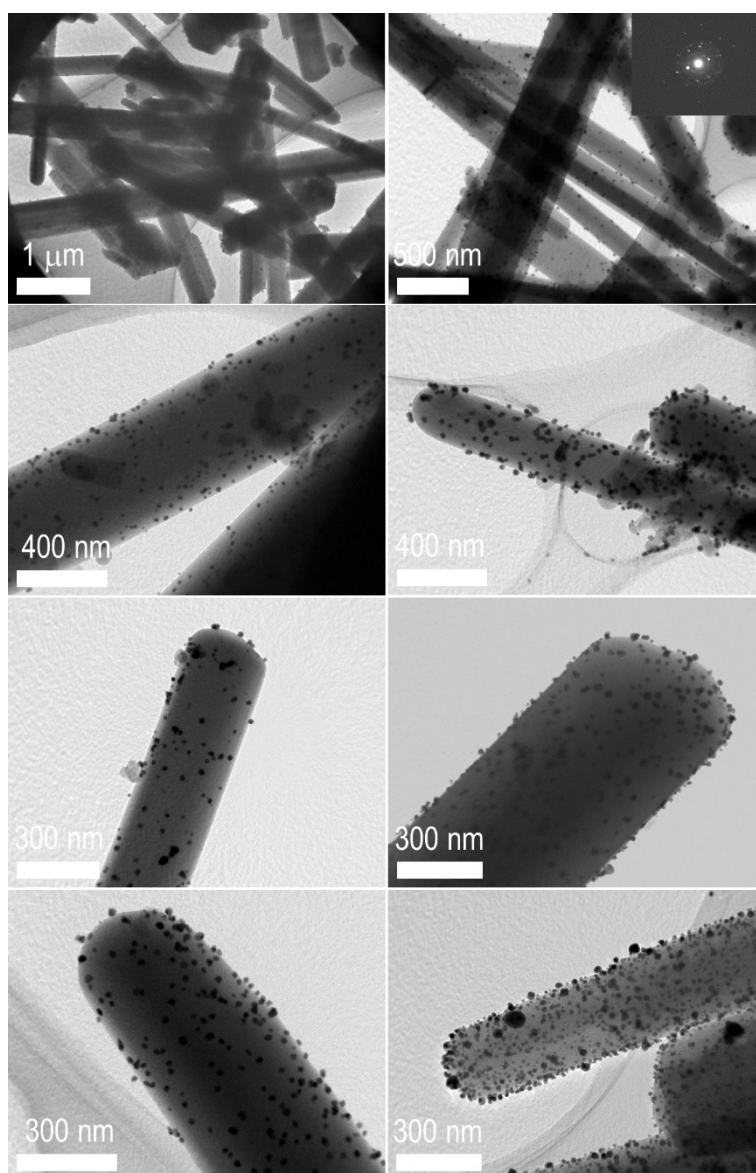


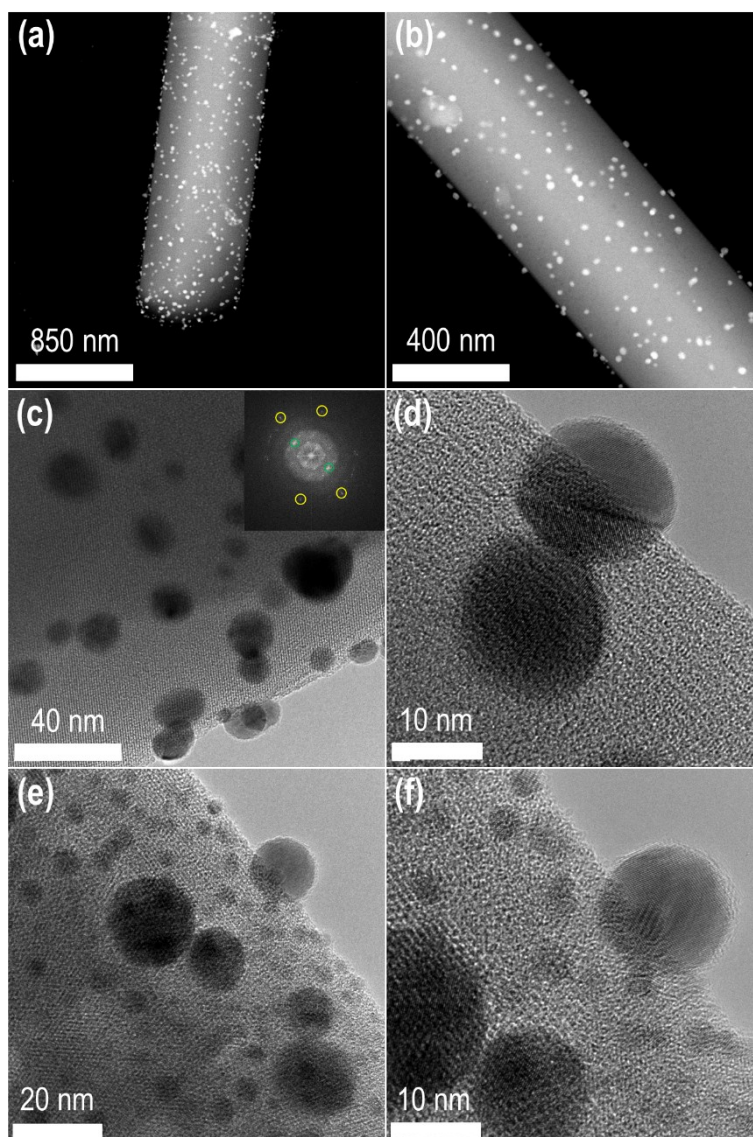
Fig. S4 Histogram of size distribution of Ag-NP in Ag-FNRs with mean diameter of  $\sim 12$  nm.

### 5. Additional TEM images of Ag-FNRs



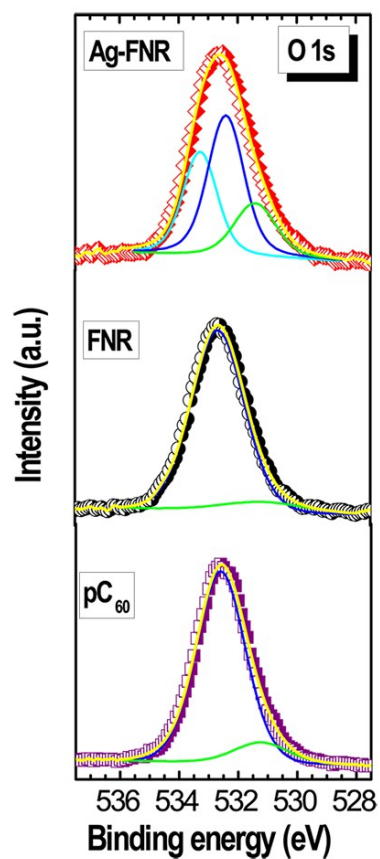
**Fig. S5** Additional TEM images of Ag-FNRs. Inset of top right image shows SAED pattern.

## 6. Additional HR-TEM images of Ag-FNRs



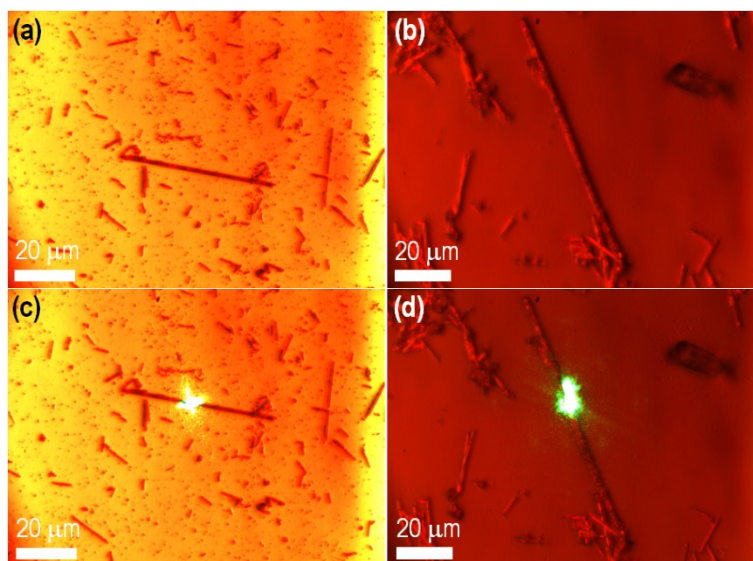
**Fig. S6** (a, b) Dark field TEM images of Ag-FNRs as typical examples and (c – f) additional HR-TEM images of Ag-FNRs. Inset of panel c shows SAED pattern of the Ag-FNR. Yellow circles reflect the diffraction of Ag-NP and green circles represent electron diffraction from crystalline fullerene C<sub>60</sub>.

## 7. Additional XPS data



**Fig. S7** XPS O 1s spectra with deconvoluted peaks for pC<sub>60</sub>, FNR and Ag-FNR.

## 8. Optical micrographs of Ag-FNR before and after Raman laser irradiations



**Fig. S8** Optical microscopic images of Ag-FNR on Si-substrate before (a,b) and after (c,d) Raman Laser irradiation during SERS measurements.



### 9. Additional SERS data: Dependence of SERS peak against R6G concentration

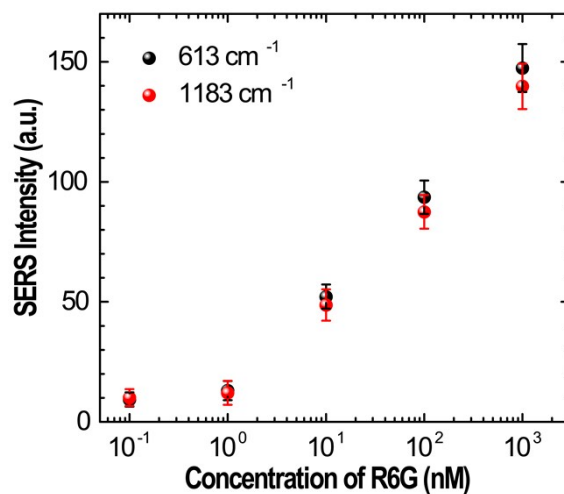


Fig. S9 Dependence of SERS peak intensity at 613 and 1183 cm<sup>-1</sup> against R6G concentration.

### 10. SERS data on Ag-NP thin film on planar substrate

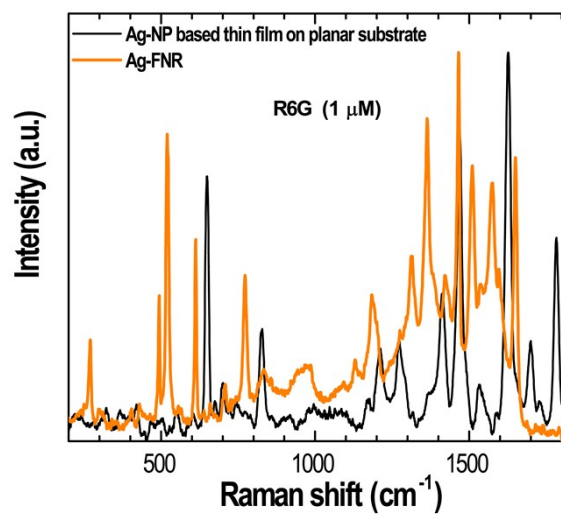


Fig. S10 Comparison of SERS data acquired on Ag-NP thin film on a planar substrate and Ag-FNR free standing substrate. R6G concentration is fixed to 1 μM.