

Supplementary Information

**Laser Assisted Blending of Ag Nanoparticles in Alumina Veil: A Highly Fluorescence Hybrid**

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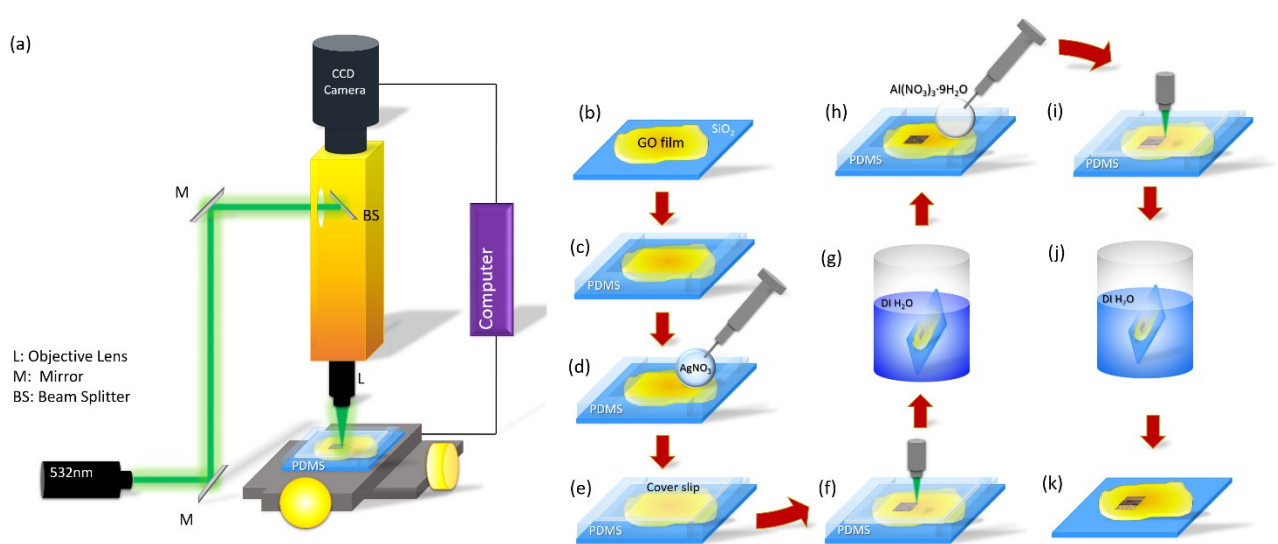
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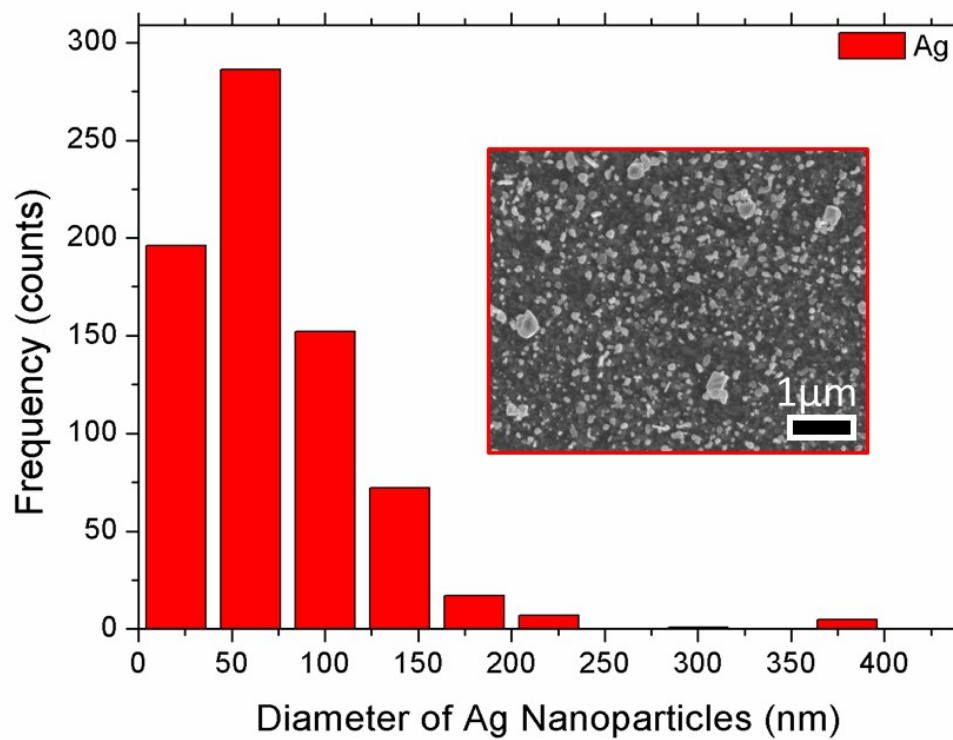
## S1. Focused laser beam technique for preferential deposition of Ag/Al bimetallic hybrid film.

Focused laser beam technique used for site selective deposition of Ag/Al hybrid film. The sequential patterning process is illustrated in Figure S1 (b-k).



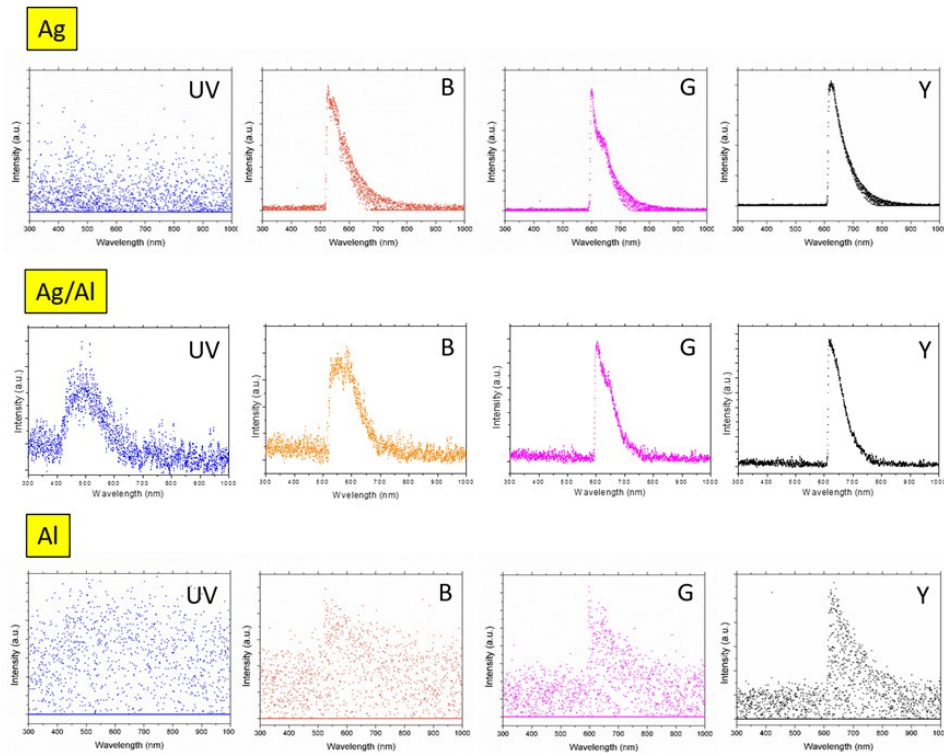
**Figure S1.** (a) Schematic of the focused laser beam setup used to achieve site selective formation of the bimetallic hybrid film on GO. (b-k) Laser assisted sequential formation of Ag nanoparticles (NPs) and Al film on GO film.

## S2. Statistical distribution based on the size of individual Ag.



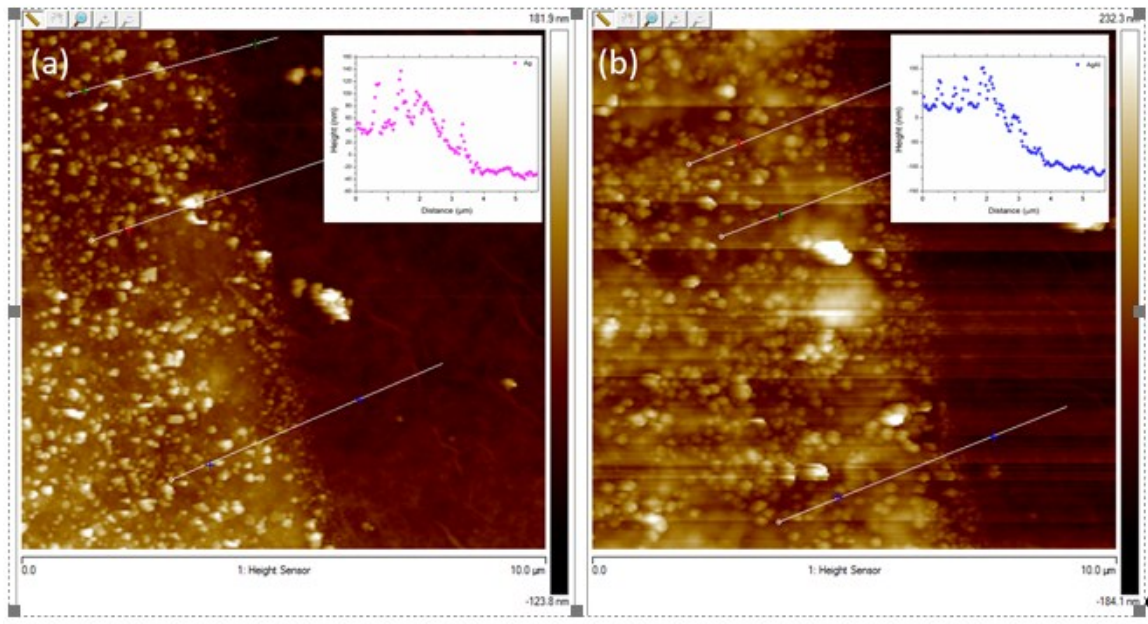
**Figure S2.** Statistical distribution of the size of the Ag NPs. Inset is a typical SEM image of the Ag NPs formed in the laser treated region.

**S3. Spectra of the emitted fluorescence from the Ag NPs, Ag/Al hybrid film and Al film under UV, Blue, Green and Yellow excitation.**



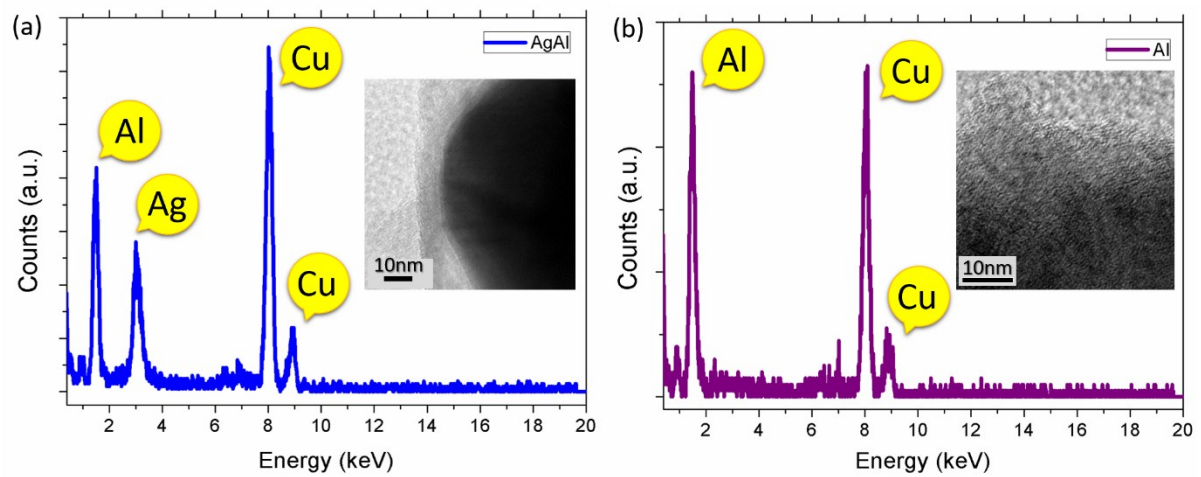
**Figure S3.** Spectra captured from the Ag NPs region, the Ag/Al hybrid film and the Al film under different external excitation.

**S4. Height profiles of the Ag NPs and the AgNPs-alumina hybrid film obtained using AFM.**



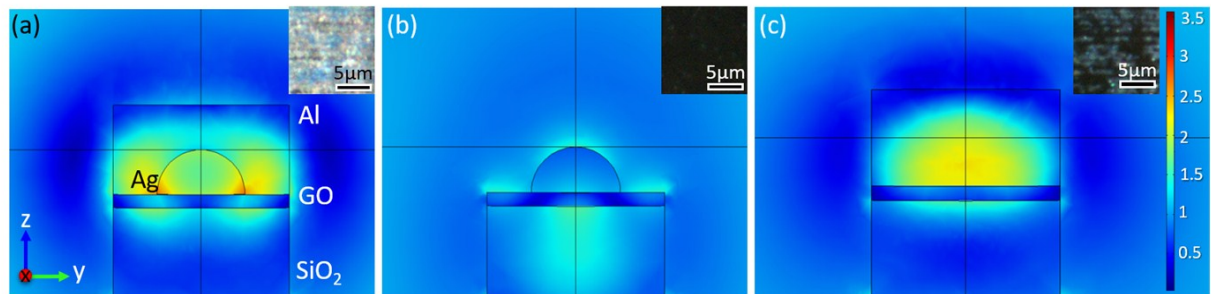
**Figure S4.** AFM height analysis of (a) Ag NPs and (b) Ag/Al hybrid film on GO film. Inset of (a) and (b) are the respective height profiles of the nanoparticles and the hybrid film.

**S5. EDX spectra obtained from an Ag NP and a small region of the Al film.**



**Figure S5.** EDX spectra obtained from (a) a Ag NP encompasses with a thin shell (inset), and (d) Al film in the absence of Ag NPs (inset).

**S6. COMSOL Multiphysics simulation of Ag NP, Ag/Al film and Al film under 350nm excitation.**

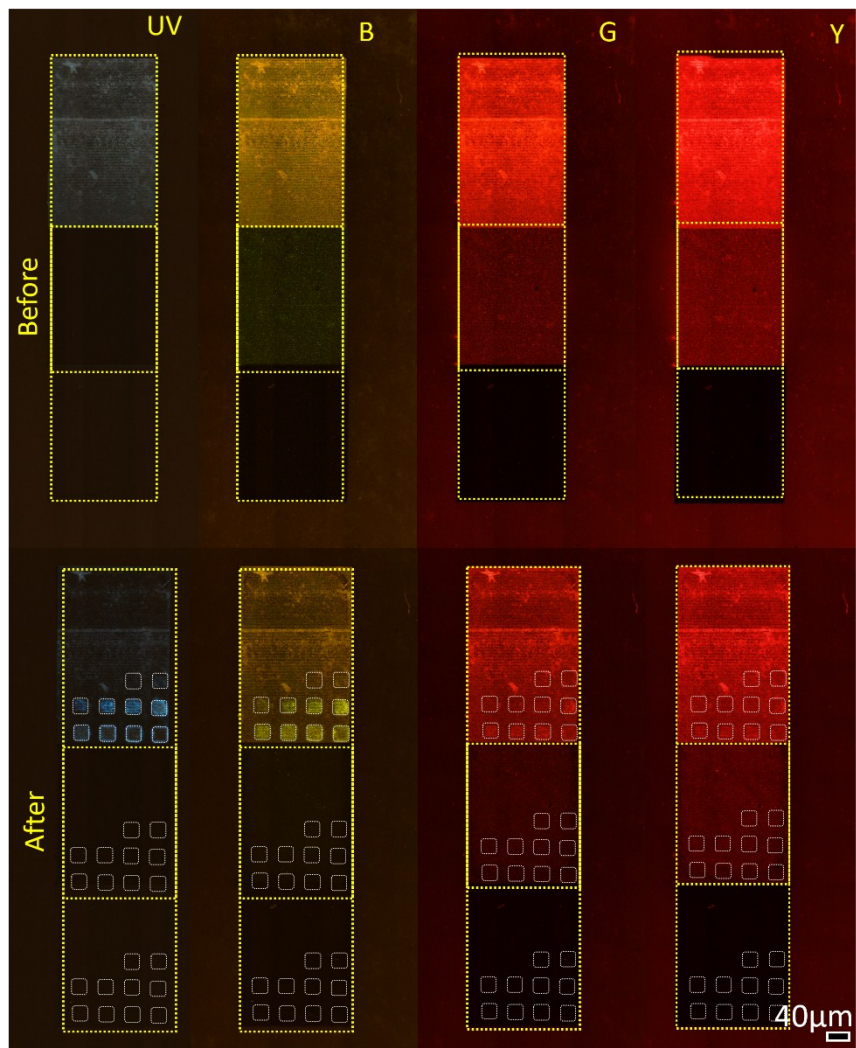


**Figure S6.** COMSOL Multiphysics simulation of (a) Ag/Al hybrid film, (b) Ag NP and (c) Al film on GO film.

The sample was excited using 350 nm external illumination. Inset are FM images taken under UV excitation of (a) Ag/Al hybrid film, (b) Ag NP and (c) Al film on GO film. Scale bar corresponds normalised electric field.



**S7. Emission from e-beam irradiated region under UV, Blue, Green and Yellow excitation.**



**Figure S7.** FM images of sample (a) before and (b) after e-beam irradiation under UV, B, G and Y excitation.