

## *Supporting Information*

### **Overcurrent electrodeposition of fractal plasmonic black gold with broadband absorption for excitation-immune SERS**

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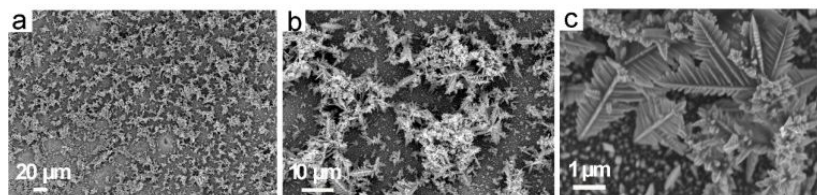
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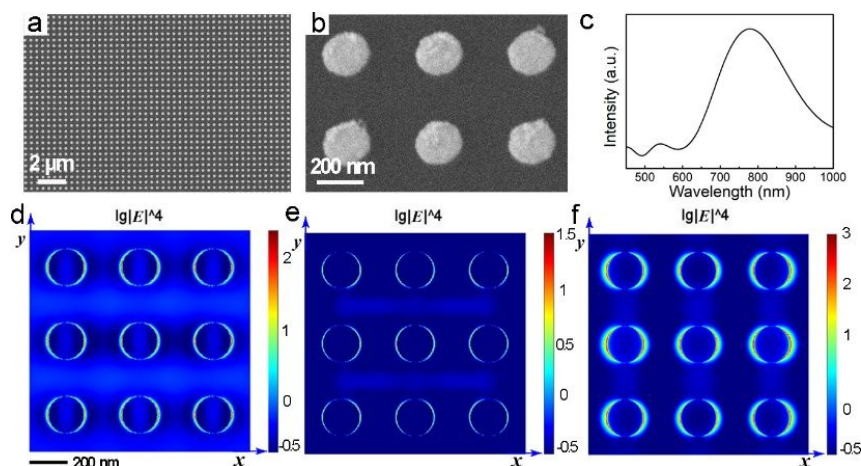
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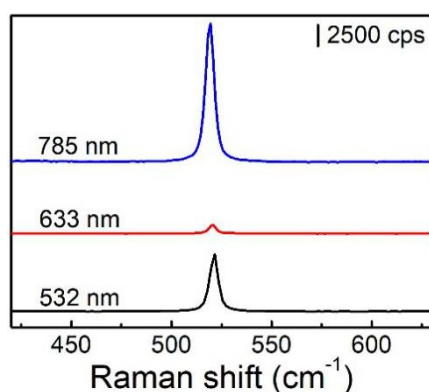
#### **Supplementary Figures**



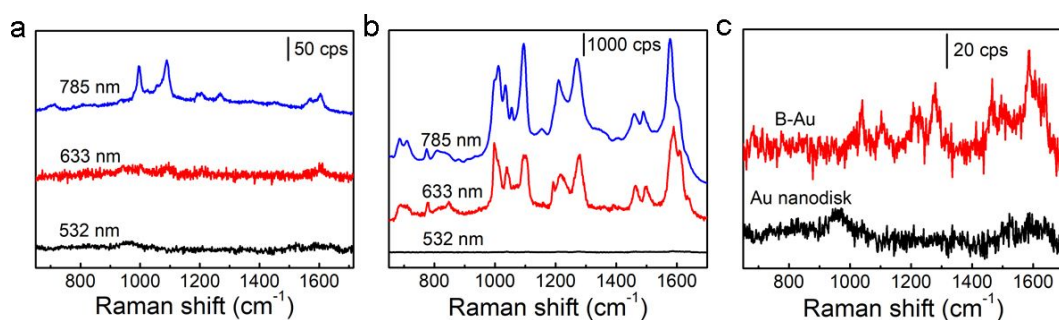
**Figure S1.** (a-c) SEM images for the B-Au with different magnifications.



**Figure S2.** (a, b) SEM images for Au nanodisk array with different magnifications and (c) corresponding FDTD-simulated scattering spectrum; field distributions on Au nanodisk excited at (d) 532, (e) 633 (f) 785 nm simulated using 3D-FDTD method.



**Figure S3.** Raman spectra of silicon wafer excited using 532, 633, and 785 nm laser for a single 1-s accumulation with the power of each laser attenuated to 10%.



**Figure S4.** Normalized SERS spectra of 4-MPY on (a) Au nano-disk array and (b) B-Au at different excitation and (c) SERS spectra of 4-MPY on Au nano-disk and

B-Au at 532 nm excitation.