

**Electronic Supplementary Material (ESI)**

**A Universal Surface Enhanced Raman Spectroscopy (SERS)-Active Graphene Cathode for  
Lithium-Air Battery**

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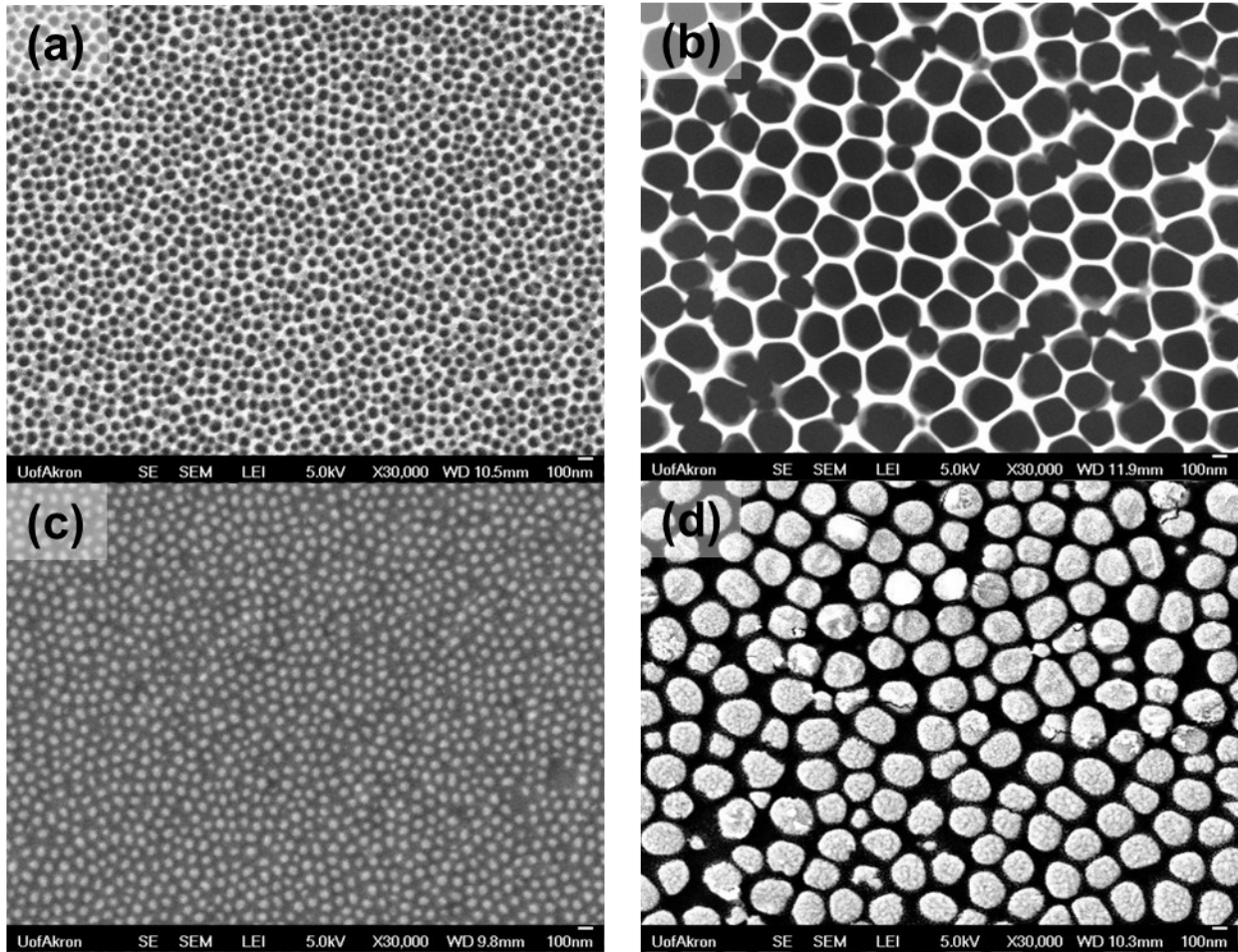


Fig. S1 a) Small pore size AAO membrane. b) Large pore size AAO membrane. c) Small size gold nano-dots obtained from small pore size AAO. d) Large size gold nano-dots obtained from large pore size AAO.

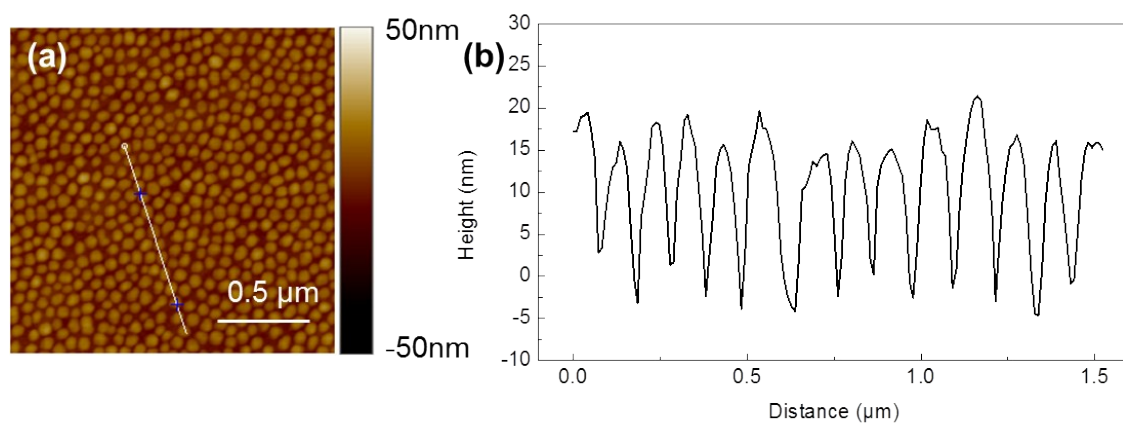


Fig. S2 AFM height image a), and height profile b), of small gold nano-dots on graphene electrode.

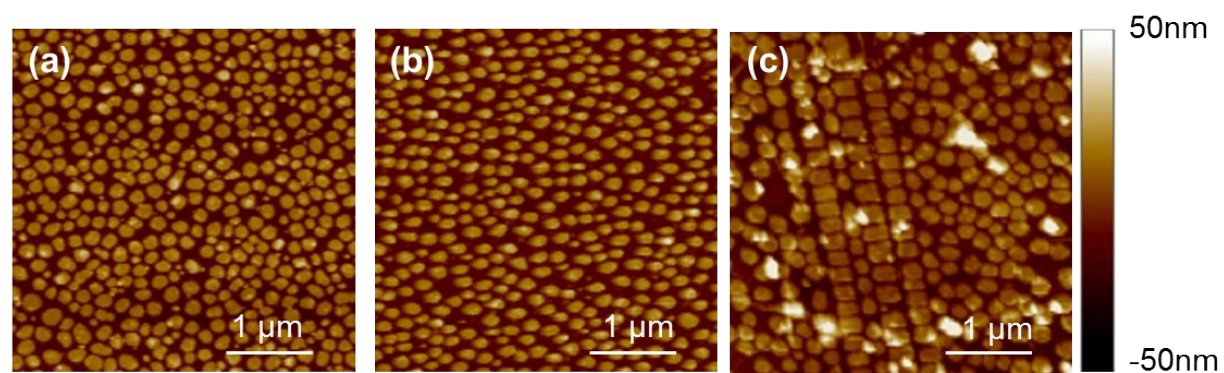


Fig. S3 AFM characterizations of large gold nano-dots obtained from AAO templates on Si a); Gold b) and Graphene electrode c).

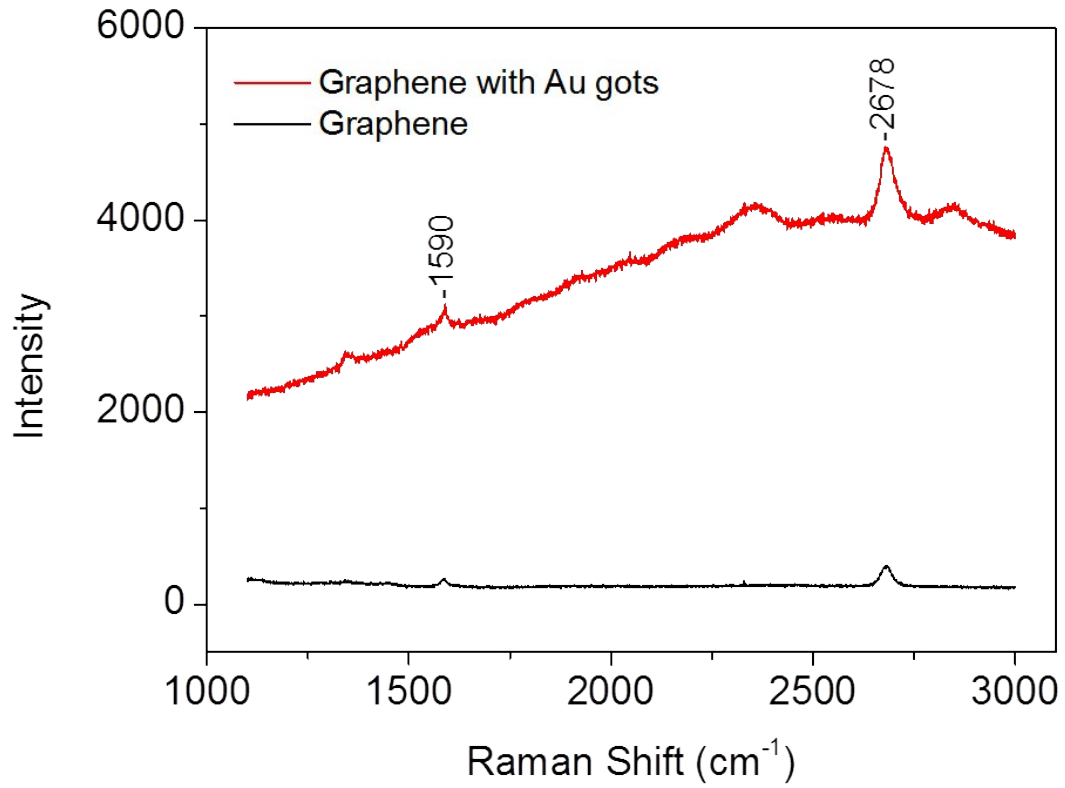


Fig. S4 Raman spectra of normal graphene electrode and graphene SERS electrode.

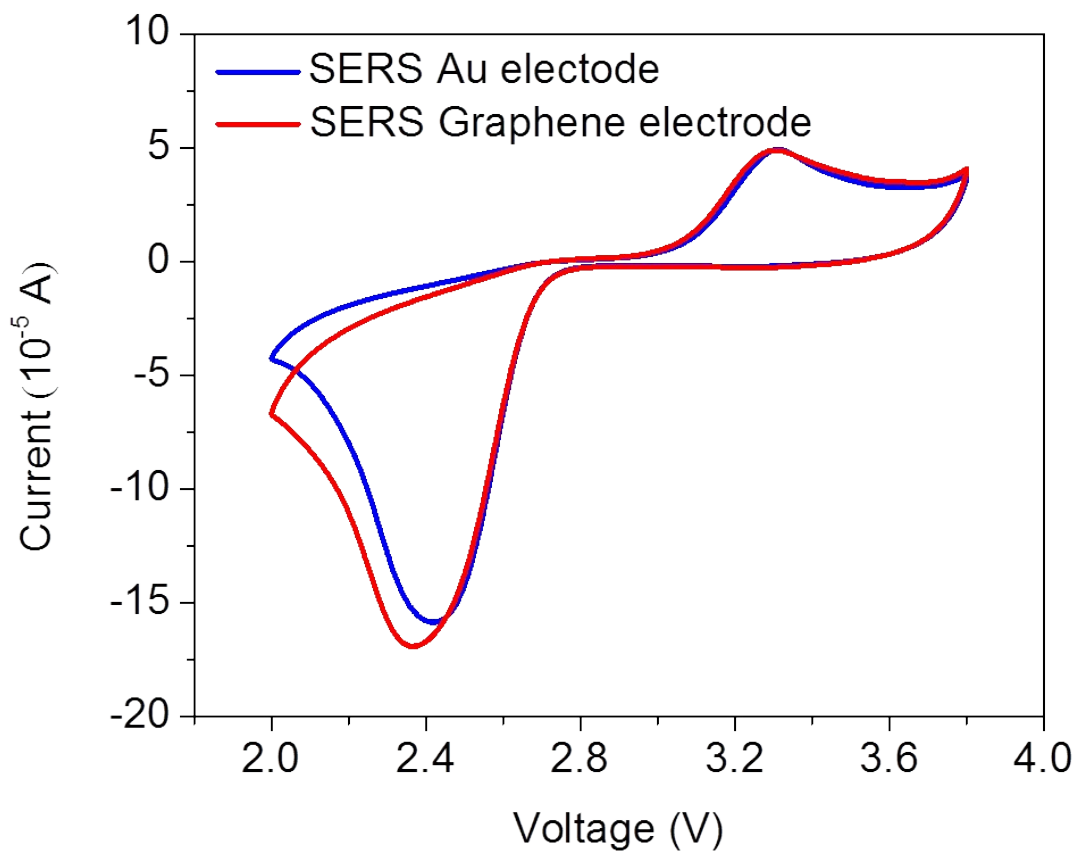


Fig. S5 Cyclic voltammogram of the Li-O<sub>2</sub> battery with SERS electrodes.

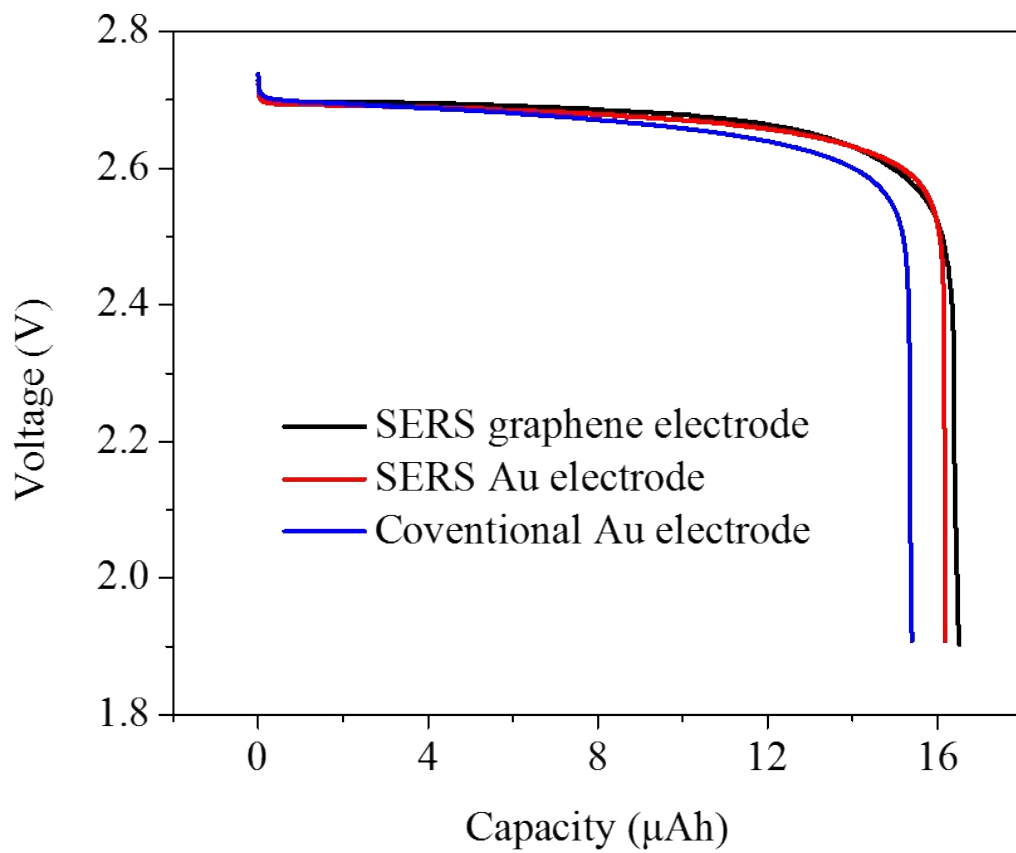


Fig. S6 Discharge curve of the Li-O<sub>2</sub> battery with SERS electrodes.