

## Electronic Supplementary Information

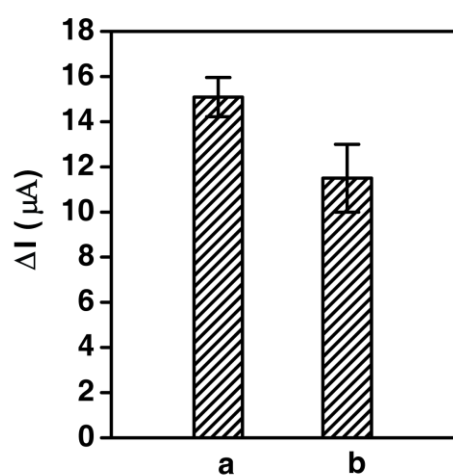
### Fractal Nanogold Electrode for Ultrasensitive Thrombin Detection

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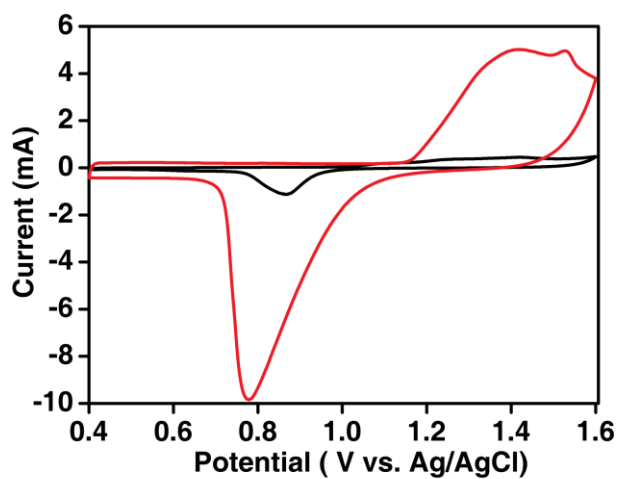
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**Fig. S1** Current reduction of biosensors. (a) FracAu biosensor in the buffer containing 1pM thrombin; (b) Bulk Au biosensor in the buffer containing 1nM thrombin. Although FracAu biosensor was placed in 1000 times diluted thrombin solution, the  $\Delta I$  is still 131% of the  $\Delta I$  for bulk Au biosensor, which indicates FracAu electrode is much more sensitive than bulk Au electrode for thrombin detection.



**Fig. S2** Cyclic voltammogram of FracAu (red) and bulk Au (black) electrode in aqueous 0.5M H<sub>2</sub>SO<sub>4</sub> solution. Scan rate is 100mV/s. The surface area of FracAu electrode is about 10.5 times compared with that of bulk Au electrode.