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Supporting Information

A wrinkled structure of gold film greatly improves the signaling of electrochemical aptamer-based biosensor

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Table of Content

Fig. S1	S3
Fig. S2	S3
Fig. S3	S4
Fig. S4	S4

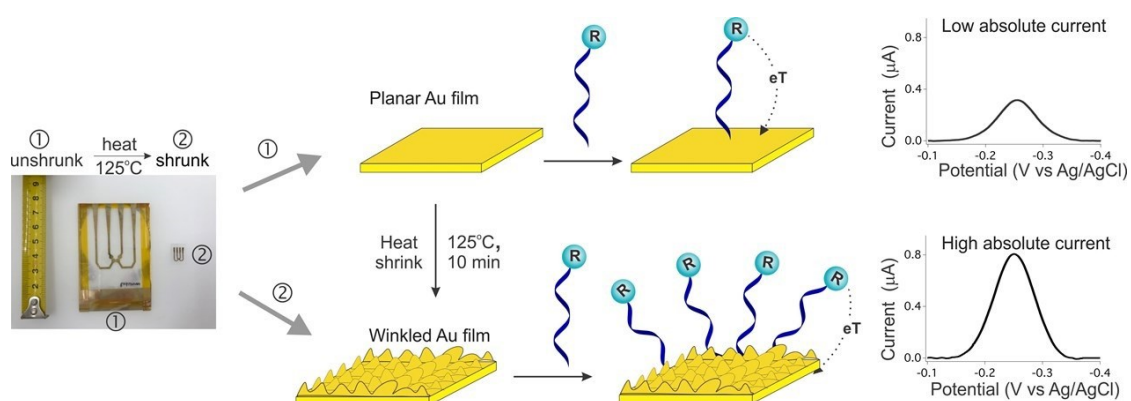


Fig. S1 E-AB sensors using wrinkled electrodes as immobilizing substrate achieve a greatly improved signaling. The optical image (left) illustrates the size and geometry of Au film before shrunk and after. While the planar electrode has a limited surface area and thus allows a minimal of probes to be attached, the wrinkled one exhibits a greatly improved surface area, thus allowing a greater total amount of probes for attachment and producing a higher signal.

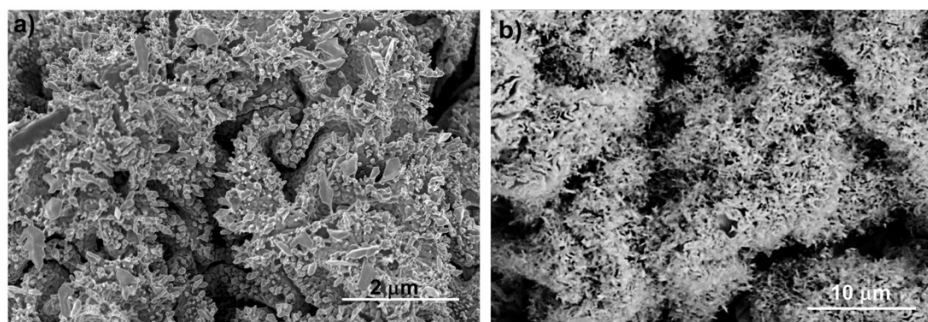


Fig. S2 Scanning electron microscopy of a) wrinkled Au electrode and b) wrinkled sensor modified by octa(3-mercaptopropyl)octasilsesquioxane (SH8-POSS).

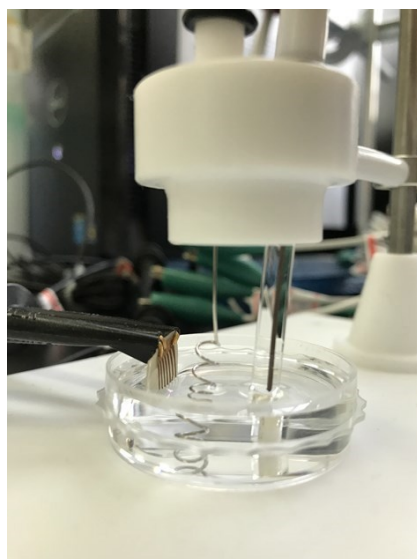


Fig. S3 The experiment exploits three-electrodes setup, using Ag/AgCl as reference electrode, Pt as counter electrode and Au-coating film as working electrodes, i.e., the sensor. Illustration is the setup for interrogating sensors that fabricated from shrink-induced, wrinkled substrate.

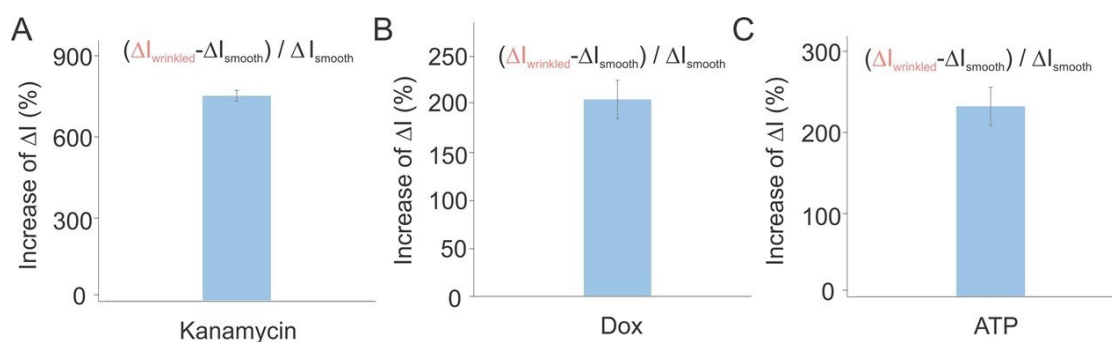


Fig. S4 The current difference between baseline (non-target) and saturation (saturated target), is significantly enhanced by the use of wrinkled electrodes. (A) Kanamycin-detecting sensors fabricated from wrinkled electrodes exhibited a greatly improved current by 750% compared to those from the smooth electrodes. (B) and (C) Doxorubicin- and ATP-detecting sensors from wrinkled electrodes, likewise, exhibited a ~200% increase in current change in comparison to those from smooth ones.