Supporting Information

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

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**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.