

## *Supporting Information*

### **A signal on aptamer-based electrochemical sensing platform using triple-helix molecular switch**

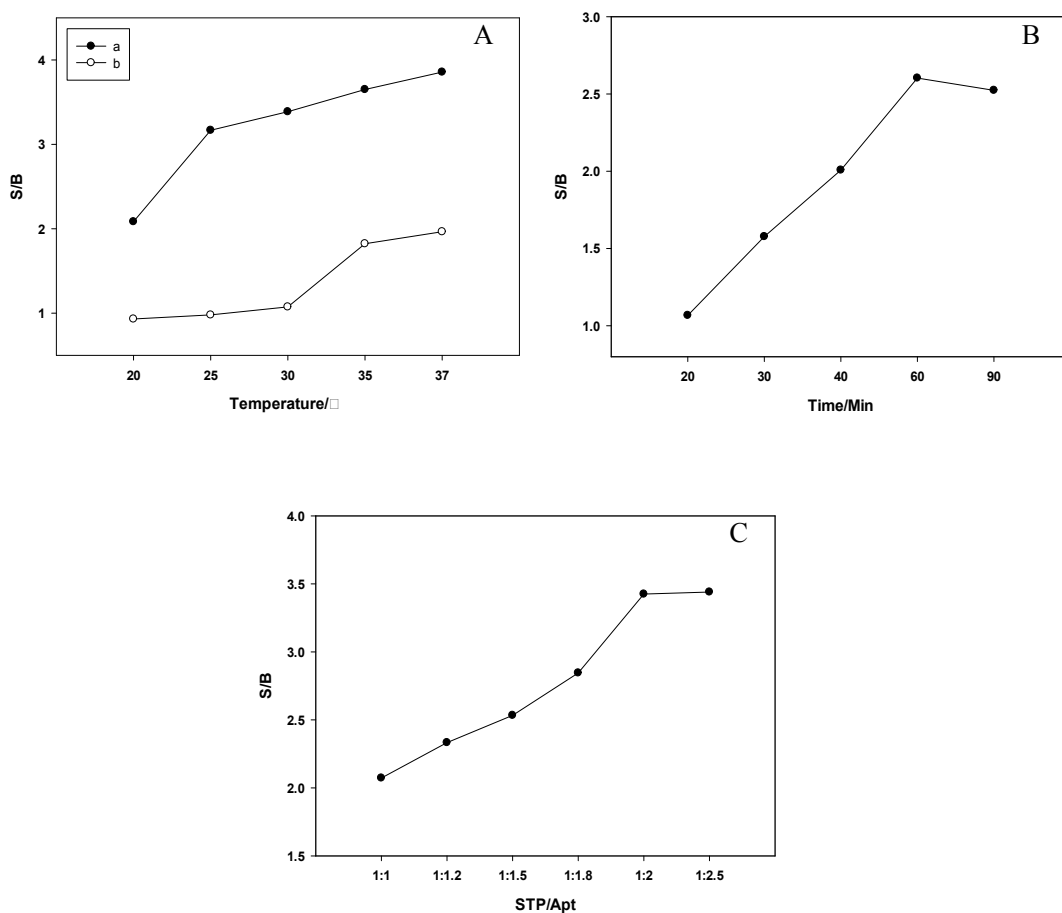
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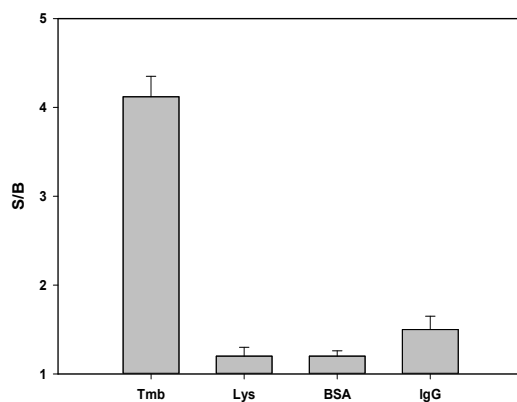
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### Supplementary figures:

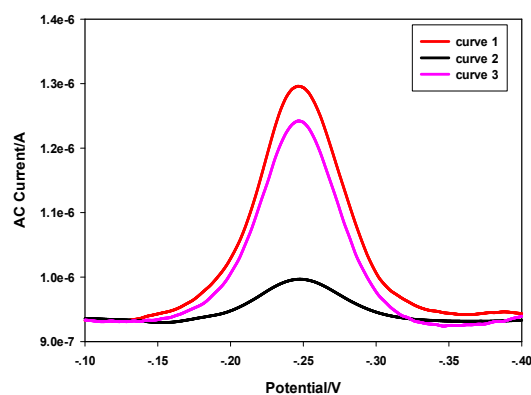


**Figure S1** Optimization of the assay conditions. The optimization of experimental conditions was investigated based on the change of the ACV peak current ratio of signal to background (S/B). (A) The effect of incubation temperature of target with Apt-THDNA on the S/B value. (a) The experiment group was operated in the presence of Tmb. (b) The experiment group was operated in the solution without Tmb. (B) The effect of incubation time of target with the Apt-THDNA on the S/B value. (C) The effect of the concentration ratio of STP/Apt on the S/B value. The concentration ratio of STP/Apt were 1/1, 1/1.2, 1/1.5, 1/1.8, 1/2 and 1/2.5, respectively. The concentration of

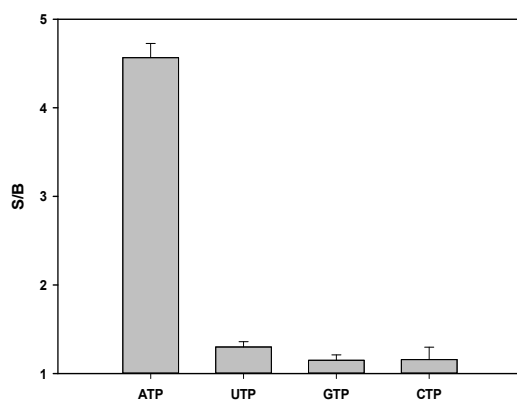
STP in the above experiment is  $1\mu\text{M}$ .



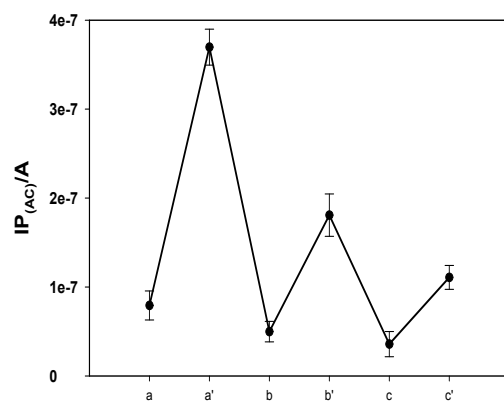
**Figure S2** The selectivity of the Apt-THDNA molecular switch based electrochemical assay for Tmb detection. The concentration of Tmb, Lys, BSA and IgG was  $1.5\mu\text{M}$ , respectively.



**Figure S3** Feasibility investigation of the electrochemical assay for ATP detection. Corresponding ACV of STP modified electrode followed by incubation with MCH (curve 1), the Apt-THDNA modified electrode followed by incubation with MCH (curve 2), the Apt-THDNA modified electrode followed by incubation with MCH and further treated with Tmb solution (curve 3).



**Figure S4** The selectivity of the Apt-THDNA molecular switch based electrochemical assay for ATP detection. The concentration of ATP, UTP, GTP and CTP was 2  $\mu$ M, respectively.



**Figure S5** The electrochemical assay of the Au electrode after several repeated concentration step changes between 2.0  $\mu$ M Apt (points a, b, and c) and 2.0  $\mu$ M ATP (points a' , b' , and c' ).