Supporting Information for:

A polyA DNA probe-based ultra-sensitive and structure-distinguishable electrochemical biosensor for the analysis of RNAi transgenic maize

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1 Investigation of hybridization temperature

To further improve the detection sensitivity of our E-biosensor, we investigated the performance of the E-biosensor at six different hybridization temperatures. The hybridization reactions were carried out at 22 °C, 37 °C, 45 °C, 50 °C, 55 °C and 60 °C. As indicated in Figure 6, the E-biosensor showed the highest S/N ratio at 50 °C, suggesting that the higher temperature might affect the dynamics of hybridization. Thus, 50 °C were used as the hybridization temperature for following experiments.

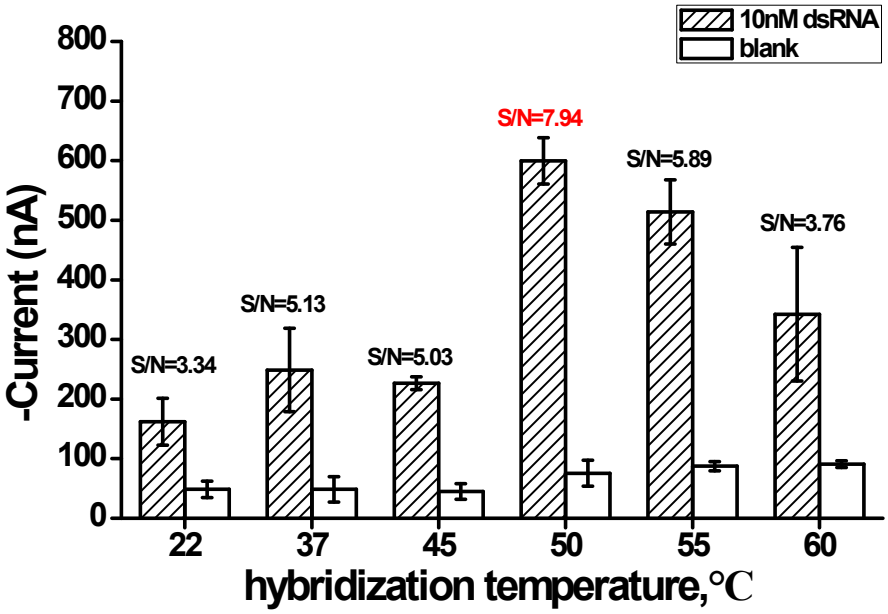

Figure S1, optimization results of hybridization temperature of the E-biosensor

2 preparation of siRNA

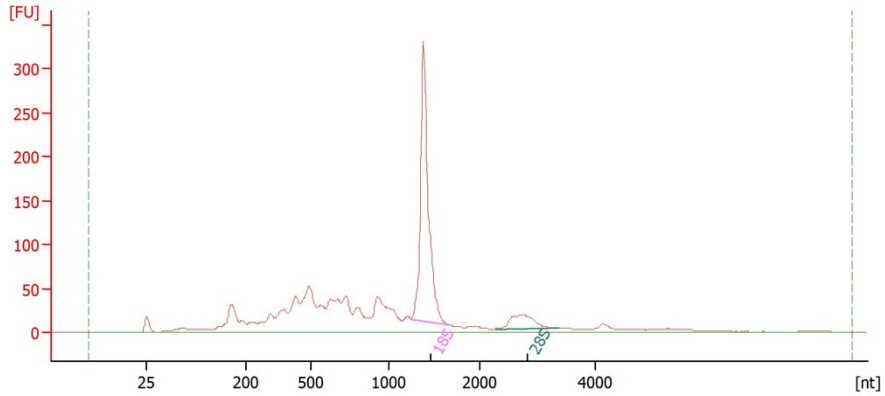

Figure S2, Characterization of purified siRNA with Agilent 2100 bioanalyzer. The siRNA was produced by digesting the long RNA with RnaseⅢ.

3 Quantification of GMO samples

Table S1. Analysis of dsRNA concentration in RNAi-based transgenic maize leaves by dPCR

RNAi-based transgenic maize leaves	Concentration (copies/μL)
11061-P	1.18×10^5
11019-P	5.83×10^4
11048-P	1.52×10^5
11061-N	2.44×10^2
Blank	0

*The dPCR reactions were performed with different primer/probe sets targeting the different dsRNA sequences in 11061-P, 11019-P, 11048-P and 11061-N. A TE buffer was analysis as the blank.

4 Electrode preparation

Gold electrodes were cleaned following a reported protocol. Briefly, gold electrodes (2 mm in diameter, CH Instruments Inc., Austin, TX) were firstly polished with micropolish alumina suspensions then sonicated in ethanol and Milli-Q water for 2 min respectively. Then the electrodes were electrochemically treated in a freshly prepared in 0.5 M H_2SO_4 solution. Finally, electrodes were rinsed with Milli-Q water and then blow-dried with nitrogen.