

## Supporting Information

### **A simple unlabeled human chorionic gonadotropin biosensor based on peptide aptamer**

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**Fig. S1. Peptide characterization images. RP-HPLC chromatogram of aptamer (A), chromatogram integral results (a), mass spectrum of aptamer (B)**

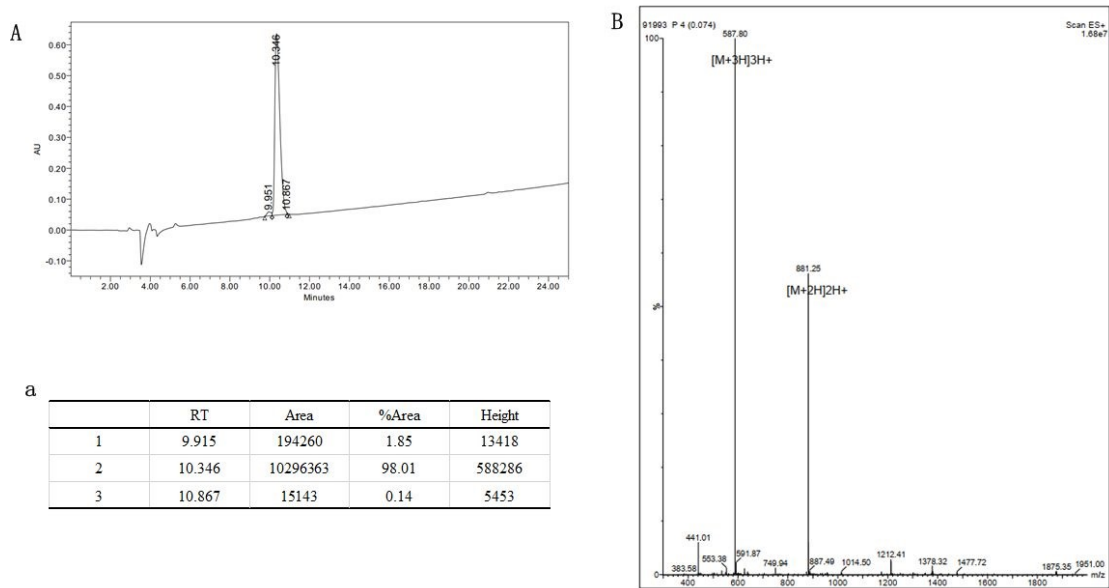
In order to determine the purity and quality of the peptide aptamer, the sequence was characterized by HPLC and MS. The results of mass spectrometric identification of the sequence were shown in the Fig. 1. The results of MS showed that the excimer ion information of the peptide was consistent with the corresponding amino acid sequences with a purity of 98.01%.

**Fig. S2. The results of different binding ratios of HCG and aptamer complexes monitored by WB, with consistent level of HCG as the control.**

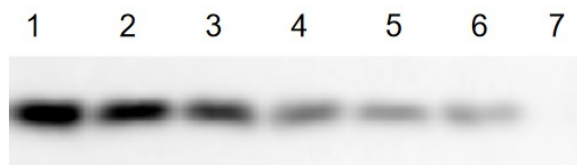
According to the ratio of the gray value of the target band to the gray value of the band with only HCG, the amount of protein or conjugates was obtained. The grayscale of HCG band with a molecular weight (MW) of 36kDa became lighter with the increase of the binding ratio (Fig. 2), indicating that the protein bound to the peptide into a complex and the molecular weight became larger, thus disappearing from the band of the HCG protein.

**Fig. S3. CV (A) and EIS (B) images of 6 SPEs in 5mM  $[\text{Fe}(\text{CN})_6]^{3-/4-}$  within the same batch.**

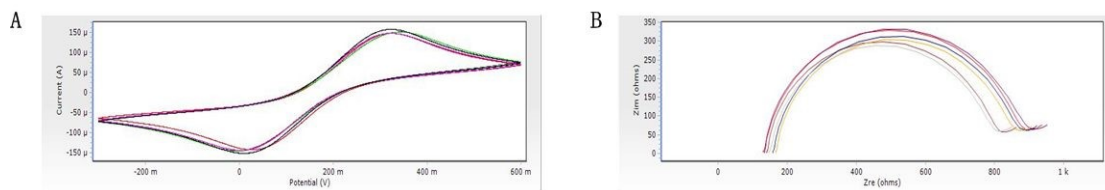
the electrochemical behavior of the SPE in potassium ferricyanide solution was studied by CV with the scanning speed of 50mV/s. The relative standard deviation (RSD) of the resistance of 6 intra-batch SPEs was calculated below 3.4%.



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**Fig. S3. CV (A) and EIS (B) images of 6 SPEs in 5mM  $[\text{Fe}(\text{CN})_6]^{3-/4-}$  within the same batch.**

**Table S1. The grayscale results of different binding ratios of HCG and aptamer complexes.**

No.	1	2	3	4	5	6	7
Binding ratio	pure HCG	1:75	1:113	1:189	1:303	1:378	Marker
Grayscale (n=3)	212 ± 52	180 ± 57	135 ± 45	91 ± 31	72 ± 44	70 ± 37	NA