Electronic Supplementary Material (ESI) for Analytical Methods.

A label-free and sensitive electrochemical aptasensor for thrombin based on the direct electron transfer of hemin and hemin@rGO nanosheets as signal probe

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The electrochemical response of the prepared electrochemical aptasensor was investigated at different scan rates, and the CV response obtained in 0.1 M PBS (pH 7.0) from –0.6 to 0.0 V (*vs*. SCE) is shown in Fig. S1 (A). It can be seen that redox peak currents increased as the rising of scan rate in the range from 20 to 350 mV s^{-1}. Moreover, as shown in Fig. S1 (B), a good linear relationship between the reductive peak current and the scan rates indicated the redox reaction at the electrode surface is a surface-controlled process.

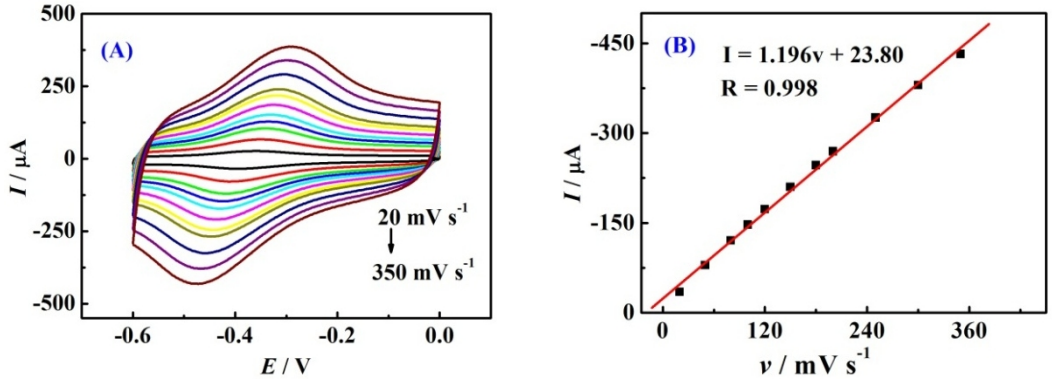

Fig. S1 (A) CVs of the proposed aptasensor in 0.1 M PBS (pH 7.0) at different scan

rates (from inner to outer): 20, 50, 80, 100, 120, 150, 180, 200, 250, 300 and 350 mV s^{-1}. (B) The dependence of the reductive peak currents on the scan rates

Table S1 Comparison of analytical performances of the aptasensors for thrombin based on different detection methods

Detection methods	Linear range	Detection limit	Reference
CL	0.0654 nM–6.54 nM	8 pM	8
CV	0.002 nM–80 nM	1 pM	9
ECL	0.01 nM–10 nM	3.8 pM	10
ECL	0.001 nM–50 nM	0.7 pM	11
DPV	0.001 nM–20 nM	0.5 pM	12
Colorimetry	0.05 nM–50 nM	48 pM	13
Fuorescence	0.062–2 nM	0.062 nM	14
CV (direct method)	1 pM–50 nM	0.45 pM	This work

Abbreviation: chemiluminescence (CL); cyclic voltammetry (CV); electrochemiluminescent (ECL); differential pulse voltammetry (DPV). [a] References 8-14 were shown in the manuscript References 8-14.