

Figure S1. FTIR analysis of WS₂ and WS₂-rGO.

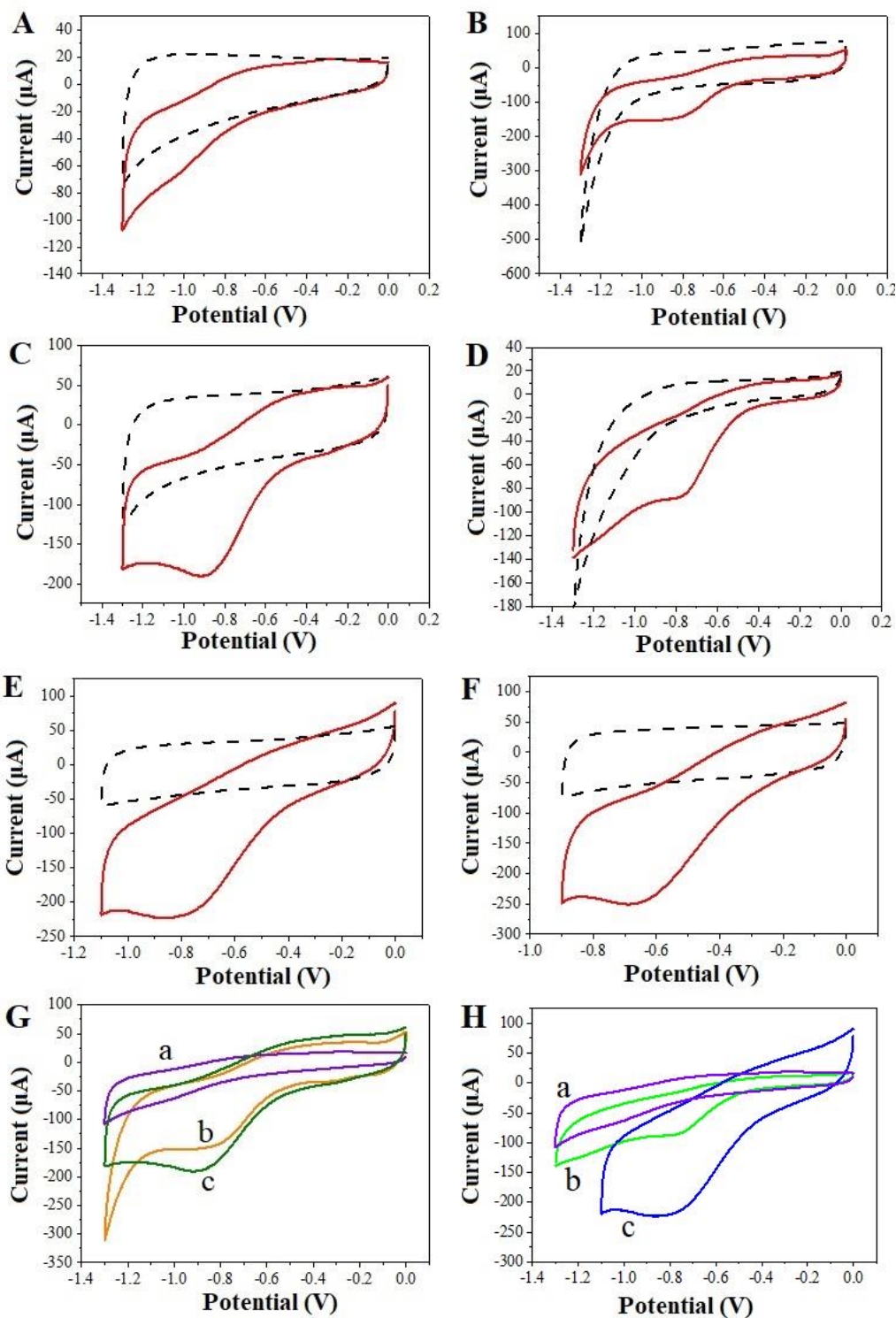


Figure S2. CVs of bare GCE (A), GO/GCE (B), rGO/GCE (C), WS_2 /GCE (D), WS_2 -rGO/GCE (E) and AuNPs/ WS_2 -rGO/GCE (F) in the absence (dotted lines) and in the presence (solid lines) of 5 mM H_2O_2 in N_2 -saturated PBS. (G) CVs of bare GCE (a), GO/GCE (b) and rGO/GCE (c) in the presence of 5 mM H_2O_2 in N_2 -saturated PBS. (H) CVs of bare GCE (a), WS_2 /GCE (b) and WS_2 -rGO/GCE (c) in the presence of 5 mM H_2O_2 in N_2 -saturated PBS.

Scan rate: 0.1 V s⁻¹

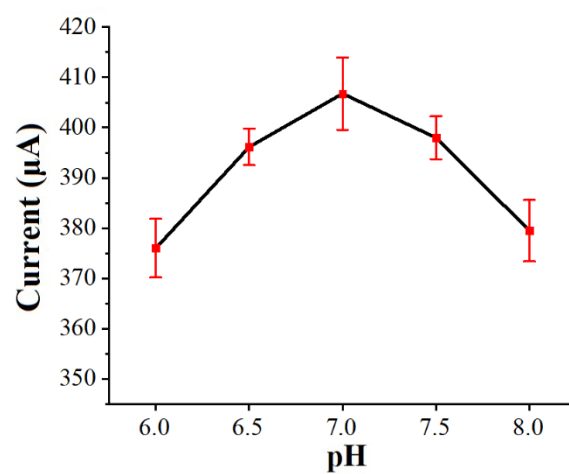


Figure S3. Electrocatalytic current responses of AuNPs/WS₂-rGO/GCE in PBS at different pH values towards the reduction of 5 mM H₂O₂.

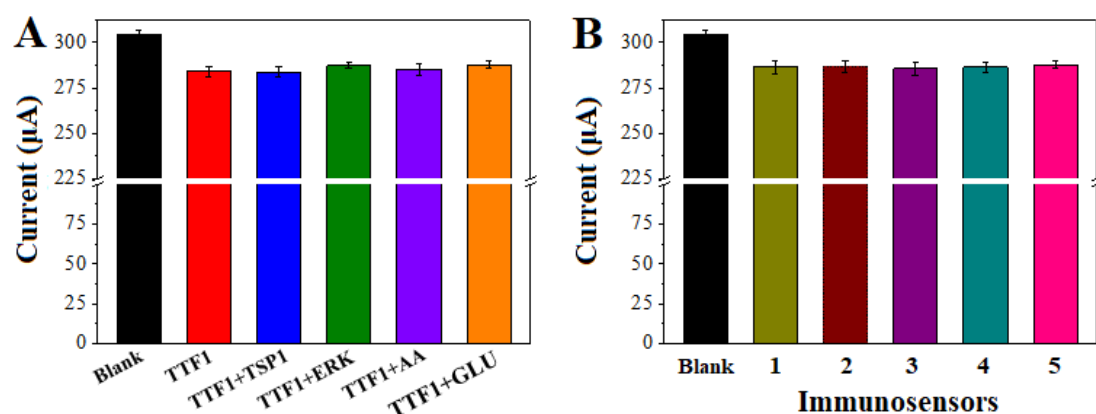


Figure S4. (A) Electrochemical signal responses of the immunosensor towards blank PBS, 15 ng mL⁻¹ TTF1, 15 ng mL⁻¹ TTF1 +100 ng mL⁻¹ TSP1, 15 ng mL⁻¹ TTF1 +100 ng mL⁻¹ ERK, 15 ng mL⁻¹ TTF1 + 100 ng mL⁻¹ BSA and 15 ng mL⁻¹ TTF1 +100 ng mL⁻¹ GLU.

(B) Electrochemical signal responses of the five immunosensors independently fabricated towards 15 ng mL⁻¹ TTF1. LSV responses were performed in a N₂-saturated pH 7.0 PBS containing 5 mM H₂O₂. Error bars represent SD from three independent determinations.

Table S1. Determination of TTF1 in human serum sample.

	Initial TTF1 in Serum Sample (ng mL⁻¹)	Added TTF1 (ng mL⁻¹)	Measured TTF1 (ng/mL)	Recovery (%, n = 3)	RSD (%, n=3)
The proposed method	0.76	15.00	15.70	99.5	3.8
		20.00	20.52	98.7	1.3
		25.00	26.53	103.1	5.2
ELISA	0.74				2.8
		15.00	15.63	99.3	4.3
		20.00	20.49	98.8	3.5
		25.00	25.64	99.1	3.3