Supporting Information

A facile and durable non-enzymatic electrochemical sensor for monitoring of cerebral H_2O_2 based on one-step fabrication of hydrogel

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1. **Optimization of GPTMS and TH concentrations**
2. **Comparison of analytical performance of the present H_2O_2 sensor with other sensors reported in literatures**

1. Optimization of GPTMS and TH concentrations

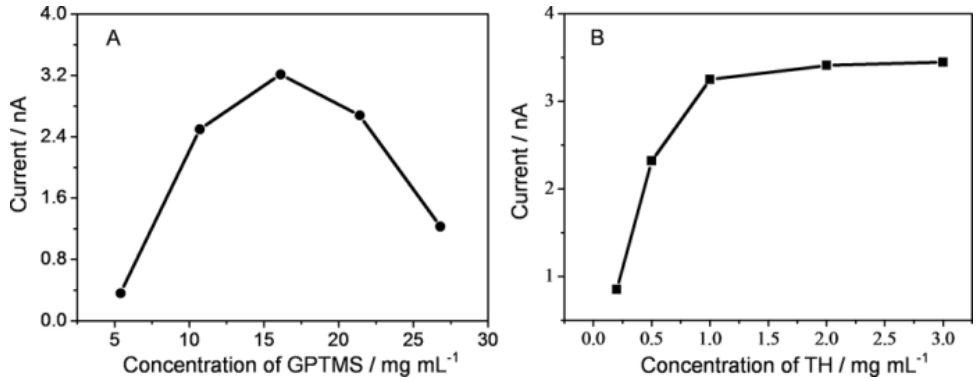

Fig. S1. Relationship between concentrations of GPTMS (A) and TH (B) on the peak currents of the CS/GPTMS/TH electrode toward 5.0×10^{-5} M H_2O_2 in 0.1 M PBS (pH 7.0).

In our present work, we developed a facile method for H_2O_2 detection using CS hydrogel as a matrix to immobilize the specific recognition – TH via one-step electrodeposition. The concentrations of GPTMS and TH were optimized and summarized in Fig. S1. As shown in Fig. S1A, the catalytic peak current of CS/GPTMS/TH electrode toward H_2O_2 increased with the increasing concentration of GPTMS up to 16.0 mg mL^{-1}. Further increasing amount of GPTMS (>16.0 mg mL^{-1}) caused the dropping peak current. Thus, the concentration of GPTMS was optimized to 16.0 mg mL^{-1} for then studying the effect of TH concentration. From Fig. R1B, it can be seen that the current response of CS/GPTMS/TH toward H_2O_2 gradually increased with the increasing concentration of TH and a maximum of current was obtained at TH concentration of 1 mg mL^{-1}. Therefore, 16.0 mg mL^{-1} GPTMS and 1 mg mL^{-1} TH was finally selected to construct the optimized CS/GPTMS/TH electrode.

2. Comparison of analytical performance of the present H_2O_2 sensor with other sensors reported in literatures

Table S1. Comparison of analytical performance of the present H_2O_2 sensor with that of other sensors reported in literatures.

Sensor	Response time (s)	Linear range (μM)	Detection limit (μM)	References
GCE/CS/GPTMS/TH	7	5-690	1.0	the present work
GCE/SA-MWCNTs/Hb	10	40-200	16.4	S1
Au/CS/AuNPs/HRP	-	8.0-120	2.4	S2
CPE/HRP/Si-Sol-gel/CS	10	250-3400	3.0	S3
GCE/PPY/NiHCF	-	100-900	100	S4
Au/HRP-ZrO_2	10	20-9450	2.0	S5
GCE/CMC-TiO_2-NTs/Hb	10	4-64	4.6	S6
Au/MH/GelB/HHC/CCP	-	0-300	10	S7

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