Supporting Information

A regenerable electrochemical sensor for electro-inactive cyclovirobuxine D detection of in biological samples

Yongliang Dong[a], Jiali Zhai[a], Ziwei Zhang[b*], Can Peng[a], Yunjing Zhang[a], and Zipin Zhang[a**]

[a] *Anhui University of Chinese Medicine, School of Pharmacy, Hefei 230012, China*

[b] *Wannan Medical College, School of Forensic Medicine, Wuhu 241002, China*

[**] Corresponding author. E-mail: zpzhang@ahtcm.edu.cn

[*] Corresponding author. E-mail: emilyzzw@163.com

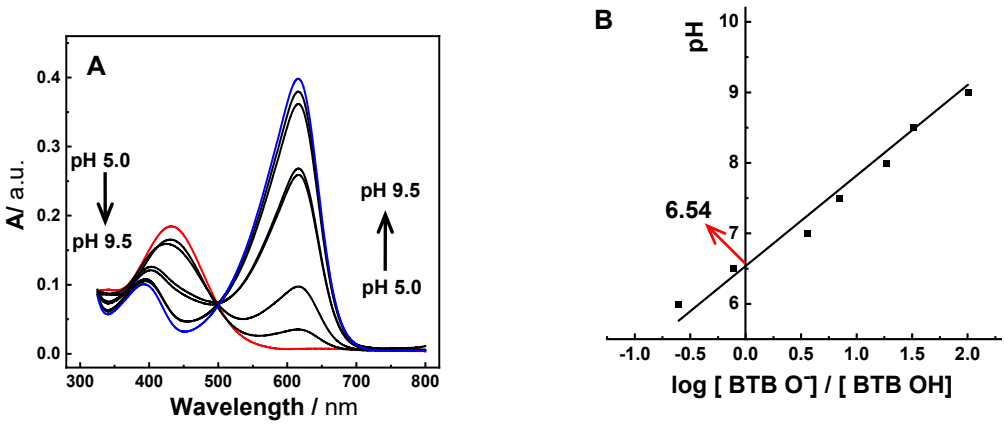

Fig. S1. Calculation of pK_a of BTB in aqueous solution: A) UV-vis absorption of 20 μM BTB recorded at different pH ranged from 5.0 to 9.5 (the arrow indicated the increasing direction of pH). B) The calculation of pK_a of BTB.

Fig. S1A shows BTB absorbance at pH ranged from pH 5.0 to 9.0, two distinct absorption bands are apparent, one is at 435 nm which is characteristic for protonated form of BTB (BTB-OH) and anther at 620 nm which is attributed to deprotonated form of BTB ($BTB\text{-}O^-$). If pH of the medium is either in acidic with a pH less than 5.0 or in basic with a pH higher than 9.0, one of forms predominates and can be assumed to be 100% of total BTB and the other can be assumed to be 0% of total BTB. Thus, we can calculate the extinction coefficient ration for two forms at 435nm and 620 nm according to Lambert-Beer law.

By rearranging the Henderson-Hasselbalch equation [35], we obtained the relationship between pKa and pH which was described as following: $pH = pK_a + \log[BTB\text{-}O^-]/[BTB\text{-}OH]$. Thus, the pH is plotted vs. log term, the intercept is pK_a, as Fig. S1B displayed, the pKa was read to be 6.54 from the intercept.

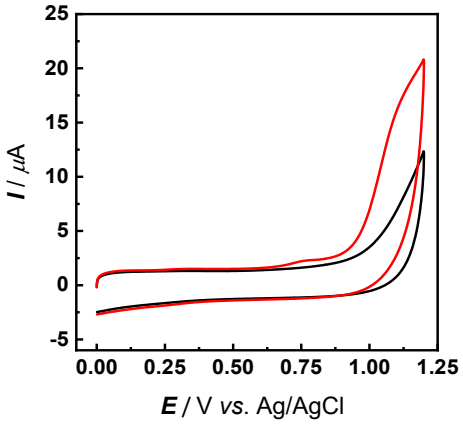

Fig. S2. CVs obtained at the SWNTs-modified GC electrode in 0.1 M PBS of pH 7.4 in the absence (black curve) and presence (red curve) of 500 μM CVB-D. Scan rate, 50 mVs^{-1}.

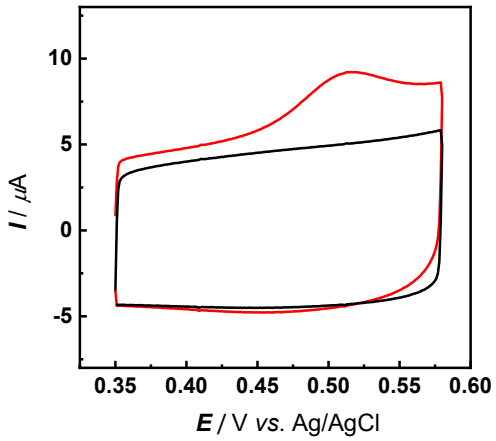

Fig. S3. CVs obtained in in 0.1M PBS of pH 7.4 for the SWNTs-modified GC electrode before (black curve) and after (red curve) being immersed in 500 μM BTB aqueous solution for 30 min. Scan rate, 50 mVs^{-1}.

Table S1. Spike-and-recoveries for plasma (n=3) and liver homogenates(n=3)

Sample	Spiked (μmol/L)	found (μmol/L)	Recovery (%)	RSD (%)
Plasma	0.1	0.098	98.0	3.8
	2.0	2.03	101.5	1.4
	45	43.80	97.3	0.27
Liver homogenates	0.1	0.104	104.0	4.6
	2.0	1.94	97.0	5.1
	45	45.55	101.2	1.8