Electronic Supplementary Material (ESI) for Analytical Methods.

Supplementary data

AMPEROMETRIC ENZYME SENSOR FOR THE RAPID DETERMINATION OF HISTAMINE

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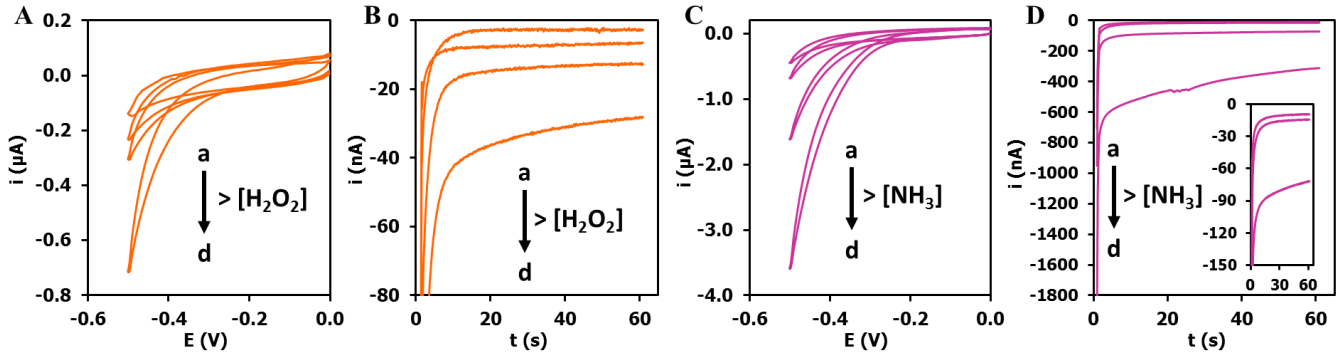

Fig. S1. (A,C) Cyclic voltammograms of (A) hydrogen peroxide and (C) ammonia solutions (in 0.1 M PB (pH 7.2)) obtained with bare SPCEs. Scan rate: 50 mV s^{-1}. (B,D) Chronoamperograms recorded at -0.3 V during 60 s for (B) hydrogen peroxide and (D) ammonia solutions (in 0.1 M PB (pH 7.2)) using bare SPCEs. Inset in D: amplification of the chronoamperograms between 0 and -150 nA. H_2O_2 and NH_3 concentrations: (a) 1 mM, (b) 15 mM, (c) 30 mM and (d) 100 mM..

For histamine detection employing the sensor, a potential of -0.3 V was applied obtaining increasing (in absolute value) cathodic currents. Fig. S1 (A,C) shows the behavior of the products of the enzymatic reaction (hydrogen peroxide and ammonia) around the measuring potential and cathodic currents were obtained for both of them. Fig. S1 (B,D) shows chronoamperograms recorded at -0.3 V for hydrogen peroxide and ammonia solutions obtaining increasing (in absolute value) cathodic currents for increasing concentrations. Therefore, both enzymatic reaction products, H_2O_2 and NH_3, contribute to the analytical signal.

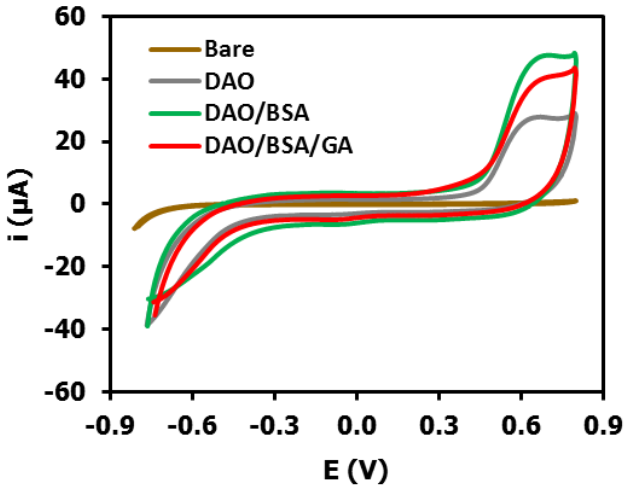

Fig. S2. Cyclic voltammograms recorded in 0.1 M PB pH 7.2 using unmodified SPCE and SPCEs modified with DAO, DAO/BSA and DAO/BSA/GA. Scan rate: 50 mV s^{-1}.

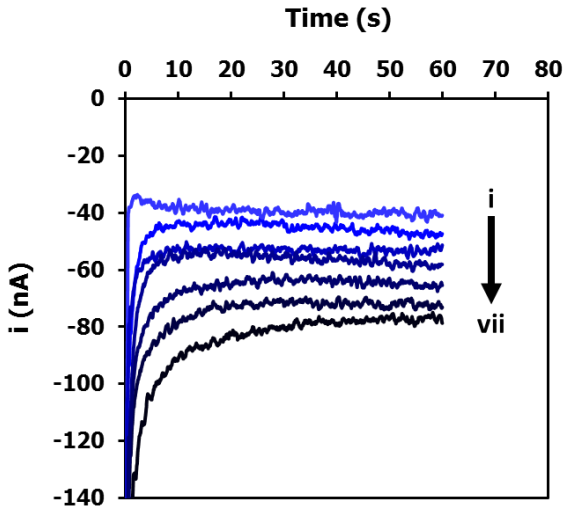

Fig. S3. Chronoamperograms recorded at -0.3 V during 60 s for different histamine concentrations (i) 0, (ii) 1, (iii) 10, (iv) 25, (v) 50, (vi) 75 and (vii) 100 mg L^{-1}.

Table S1. Figures of merit of the developed electrochemical biosensor.

Figure of merit	
Linear range	1.0 – 100.0 mg L^{-1}
Correlation coefficient (r)	0.9991
Slope (m)	0.327 nA mg^{-1} L
Standard deviation of the slope (S_m)	0.007 nA mg^{-1} mL
Intercept (b)	8.8 nA
Standard deviation of the intercept (S_b)	0.4 nA
Standard deviation of the linear regression ($S_{y/x}$)	0.58
Standard deviation of the method (S_{xo})	1.8 mg L^{-1}
Coefficient of variation of the method (V_{xo})	4.1%
Limit of detection (LOD)	0.94 mg L^{-1}