SUPPORTING INFORMATION

A nano-magnetic electrochemical sensor for the determination of mood disorder substances

Fernando H Cincotto[a]*, Daniel A. S. Carvalho[a], Thiago C Canevari[b], Henrique E. Toma[c], Orlando Fatibello-Filho[a], Fernando C. Moraes[a]*

[a]Chemistry Department, Federal University of São Carlos, 13565-905, São Carlos, SP, Brazil

[b]Engineering School, Mackenzie Presbiterian University, 01302-907, São Paulo, SP, Brazil

[c]Institute of Chemistry, University of São Paulo, 05508-000, São Paulo, SP, Brazil;

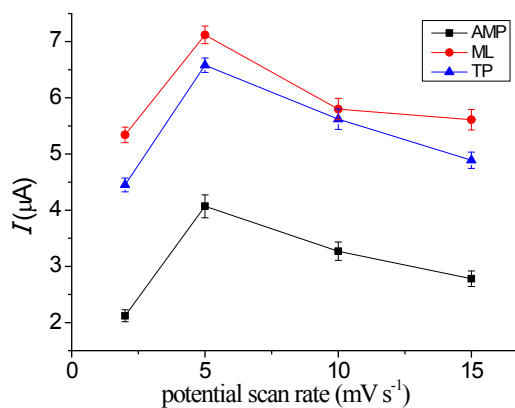*Corresponding authors: fernandocincotto@gmail.com, fcmoraes@ufscar.br

Fig. 1S. Influence of the potential scan rate of GCE/MagNPs/Cdots on the DPV signal of the composite electrode toward 10.0 μmol L^{-1} mix solution of AMP, ML and TP in 0.1 mol L^{-1} BR-buffer pH 3.0. Modulation amplitude = 50 mV, step potential = 2 mV.

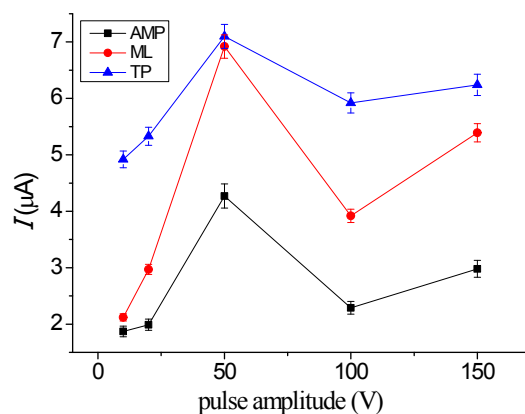Fig. 2S. Influence of the pulse amplitude of GCE/MagNPs/Cdots on the DPV signal of the composite electrode toward 10.0 µmol L^{-1} mix solution of AMP, ML and TP in 0.1 mol L^{-1} BR-buffer pH 3.0. Scan rate = 5 mV s^{-1}, step potential = 2 mV.
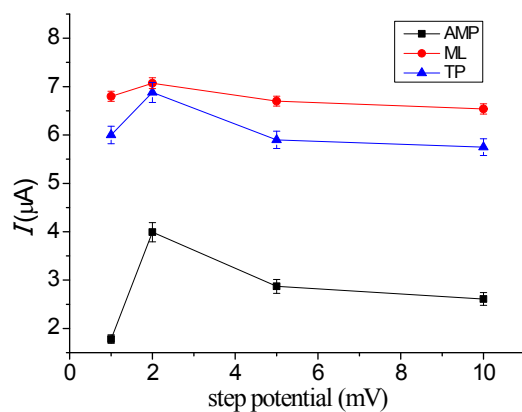

Fig. 3S. Influence of the step potential of GCE/MagNPs/Cdots on the DPV signal of the composite electrode toward 10.0 µmol L^{-1} mix solution of AMP, ML and TP in 0.1 mol L^{-1} BR-buffer pH 3.0. Scan rate = 5 mV s^{-1}, Modulation amplitude = 50 mV.
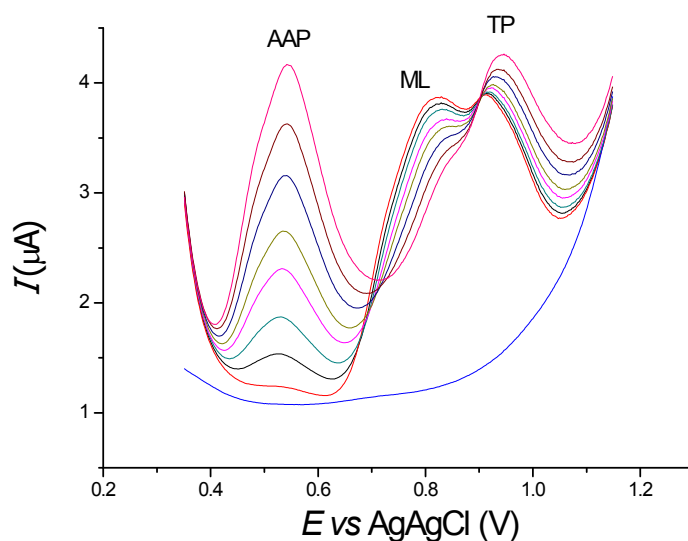
Fig. 4S-A. Differential pulse voltammetry for the simultaneous determination of amitriptyline in the presence of melatonin and tryptophan using the GC/MagNPs/Cdots composite electrode, in 0.1 mol L^{-1} BR-buffer at pH 3.0.
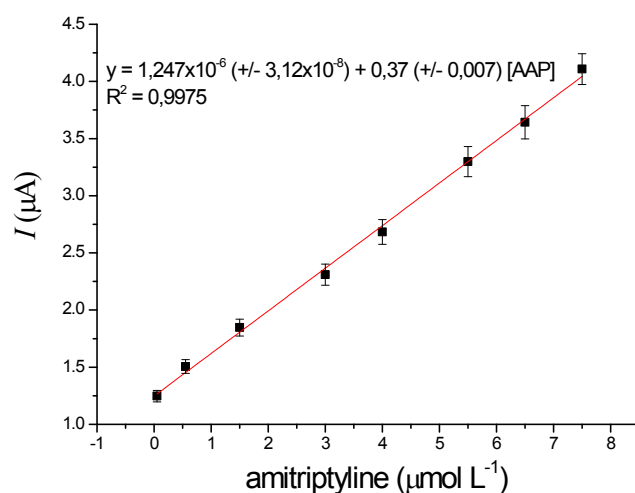

Fig. 4S-B. Analytical curve of amitriptyline (concentration range of (μmol L^{-1}): 0,05; 0,55; 1,50; 3,00; 4,00; 5,50; 6,50; 7,50) in the presence of melatonin and tryptophan using the GC/MagNPs/Cdots composite electrode, in 0.1 mol L^{-1} BR-buffer at pH 3.0.
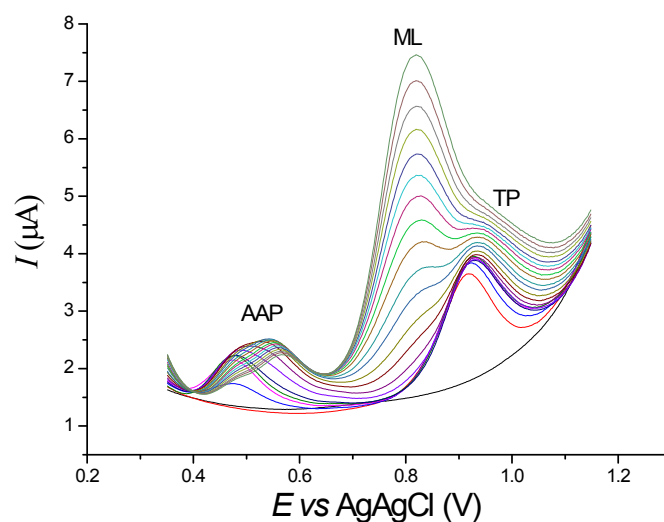
Fig. 5S-A. Differential pulse voltammetry for the simultaneous determination of melatonin in the presence of amitriptyline and tryptophan using the GC/MagNPs/Cdots composite electrode, in 0.1 mol L^{-1} BR-buffer at pH 3.0.
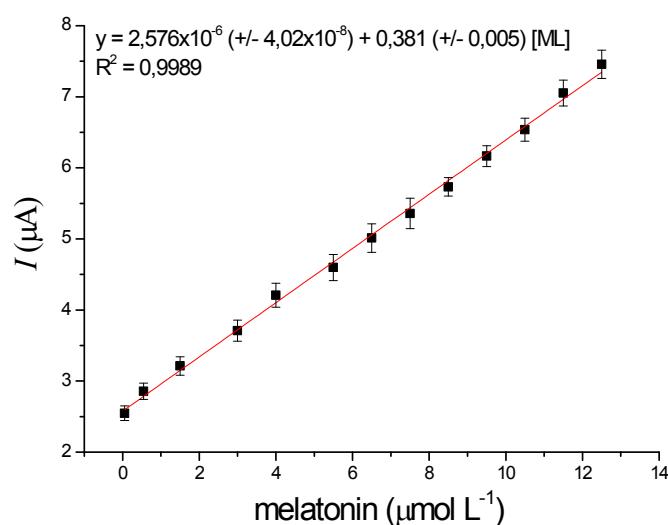

Fig. 5S-B. Analytical curve of melatonina (concentration range of (µmol L^{-1}): 0,05; 0,55; 1,50; 3,00; 4,00; 5,50; 6,50; 7,50; 8,50; 9,50; 10,50; 11,50; 12,50) in the presence of amitriptyline and tryptophan using the GC/MagNPs/Cdots composite electrode, in 0.1 mol L^{-1} BR-buffer at pH 3.0.
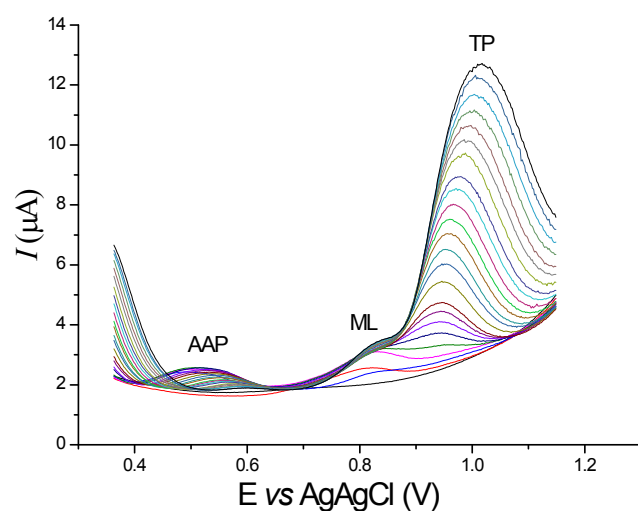
Fig. 6S-A. Differential pulse voltammetry for the simultaneous determination of tryptophan in the presence of amitriptyline and melatonin using the GC/MagNPs/Cdots composite electrode, in 0.1 mol L^{-1} BR-buffer at pH 3.0.
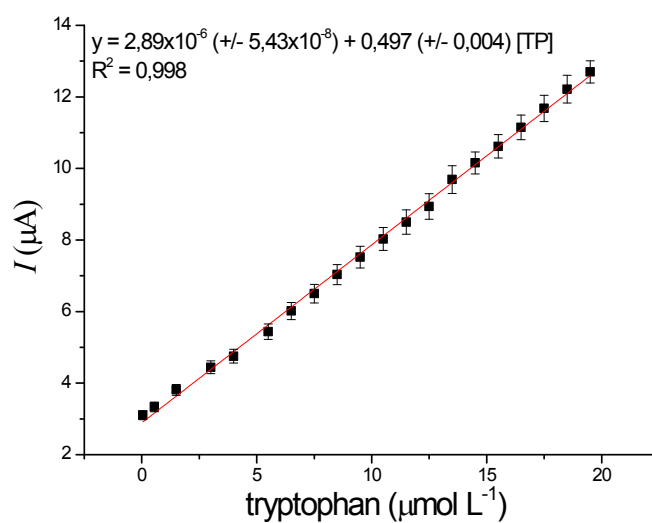

Fig. 6S-B. Analytical curve of tryptophan (concentration range of (μmol L^{-1}): 0,05; 0,55; 1,50; 3,00; 4,00; 5,50; 6,50; 7,50; 8,50; 9,50; 10,50; 11,50; 12,50; 13,50; 14,50; 16,50; 17,50; 18,50; 19,50) in the presence of amitriptyline and melatonin using the GC/MagNPs/Cdots composite electrode, in 0.1 mol L^{-1} BR-buffer at pH 3.0.

Table 1S. Results obtained from the selectivity studies of possible concomitant interferents in the sample of AMP, ML and TP.

Concomitant	Current (I_{pa} / μA)			Interference* (%)
	AMP	ML	TP	
absence	4.020	7.220	6.590	-
ascorbic acid	4.044[a]	7.241	6.613	+0.6
uric acid	4.052[b]	7.258	6.624	+0.8
dopamine	4.056	7.321[c]	6.632	+1.4
estriol	4.021	7.229	6.603[d]	+0.2
17β-estradiol	4.028	7.234	6.610[e]	+0.3

[a] ascorbic acid displayed the highest value of interference (+0.6%) toward AMP. For other analytes the interference was not significative.

[b] uric acid displayed the highest value of interference (+0.8%) toward AMP. For other analytes the interference was not significative.

[c] dopamine displayed the highest value of interference (+1.4%) toward ML. For other analytes the interference was not significative.

[d] estriol displayed the highest value of interference (+0.2%) toward TP. For other analytes the interference was not significative. For other analytes the interference was not significative.

[e] 17β-estradiol displayed the highest value of interference (+0.3%) toward TP. For other analytes the interference was not significative.