Electronic Supplementary Material (ESI) for Nanoscale

Supplementary Information

Title: Electrophoretically deposited reduced graphene oxide platform for food toxin detection

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Fig. S1: Atomic force micrograph of (a) RGO/ITO and (b) anti-AFB_1/ RGO/ITO electrode surface.

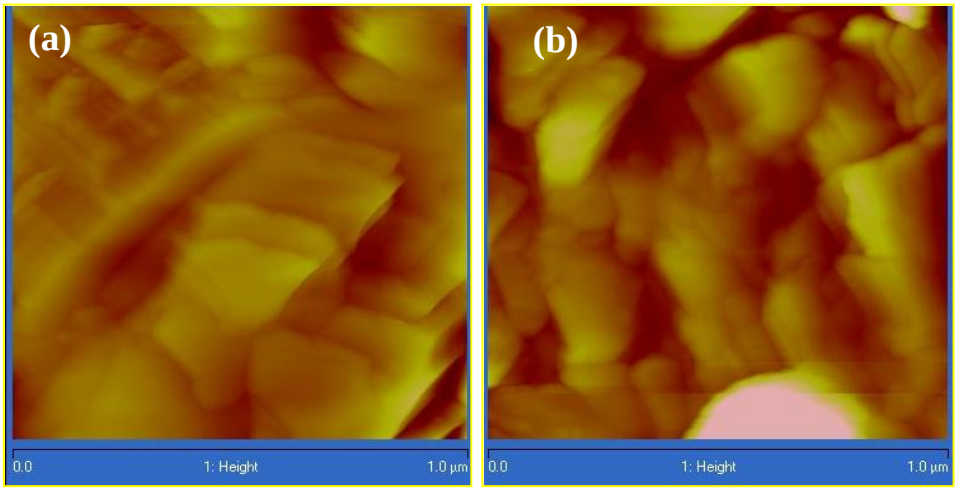

Fig. S2: XPS analysis of N1s core level spectra of RGO/ITO and anti-AFB1/ RGO/ITO electrode surface.

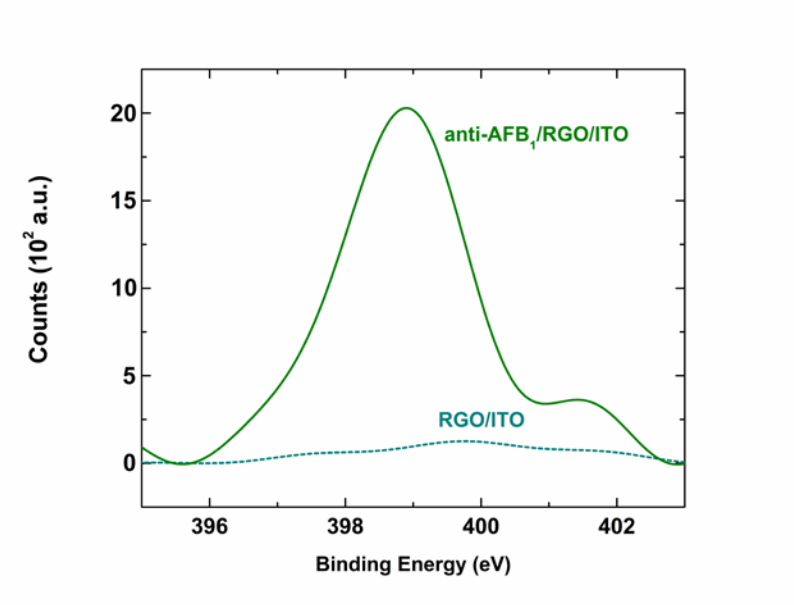

Fig. S3: Fourier transform- infra red (FT-IR) spectra of RGO/ITO (curve a) and *anti*-AFB_1/RGO/ITO film (curve b).

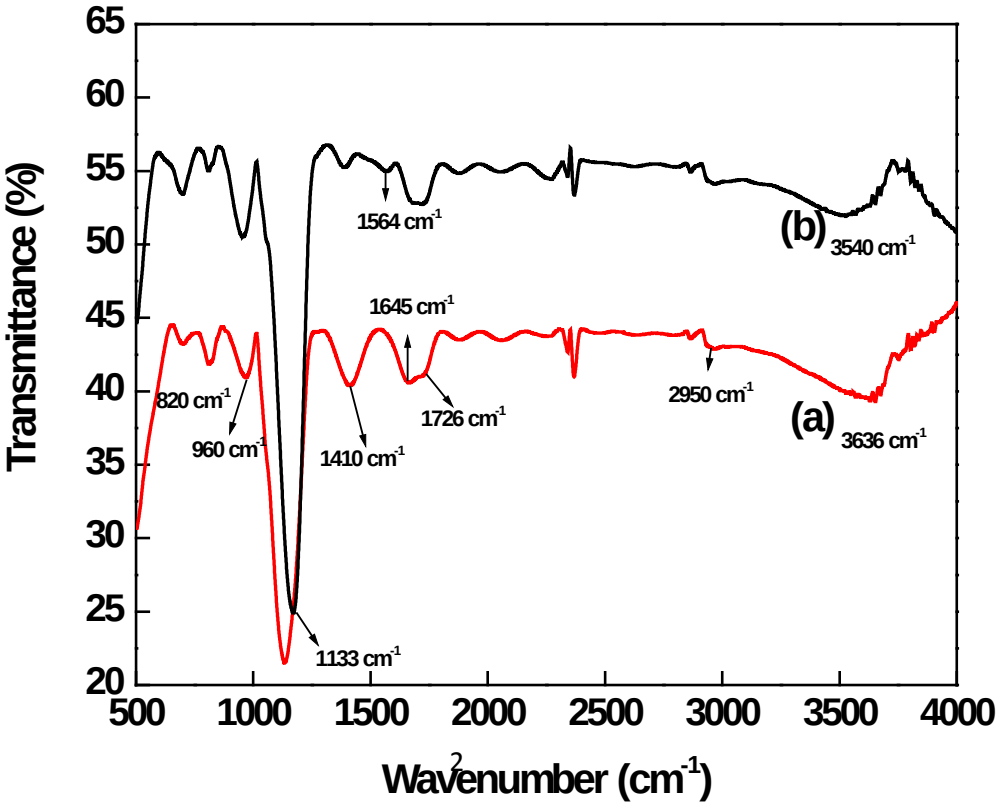

Fig. S4: Cyclic voltammogram (CV) of GO/ITO (a) and RGO/ITO electrodes (b), in PBS (pH 7.4) containing 5mM $[Fe(CN)_6]^{3-/4-}$.

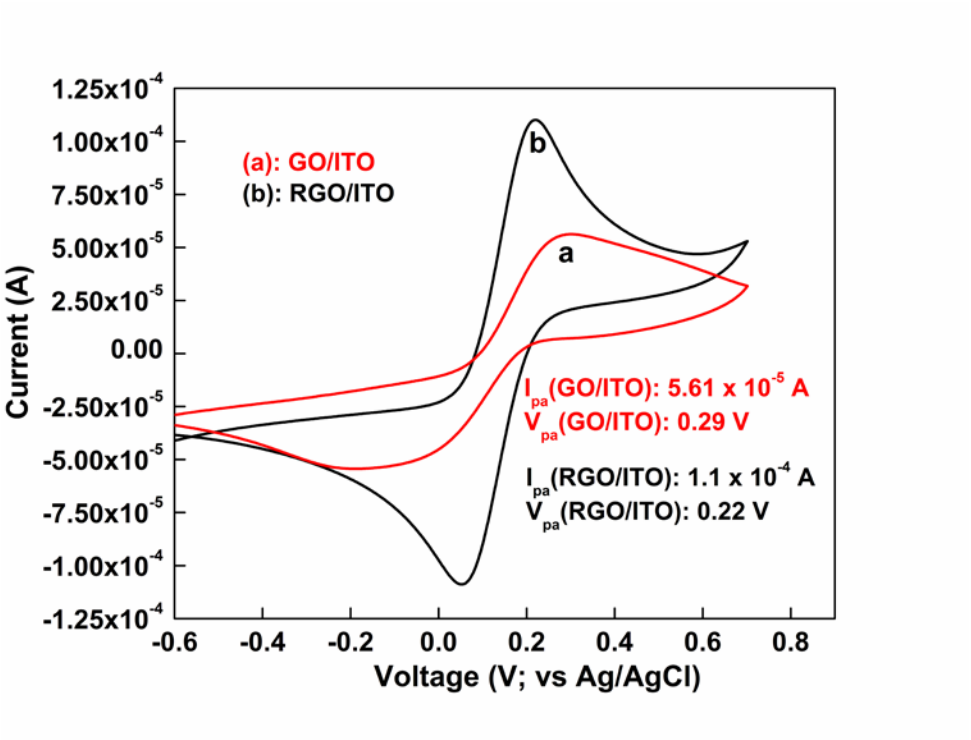

Fig. S5: Antibody concentration optimization curve: response current of various *anti*-AFB_1/RGO/ITO immunoelectrodes containing 1, 2, 4, 6, 8, 10, 12, 15 and 20 µg/mL of antibody (anti-AFB_1) concentration respectively.

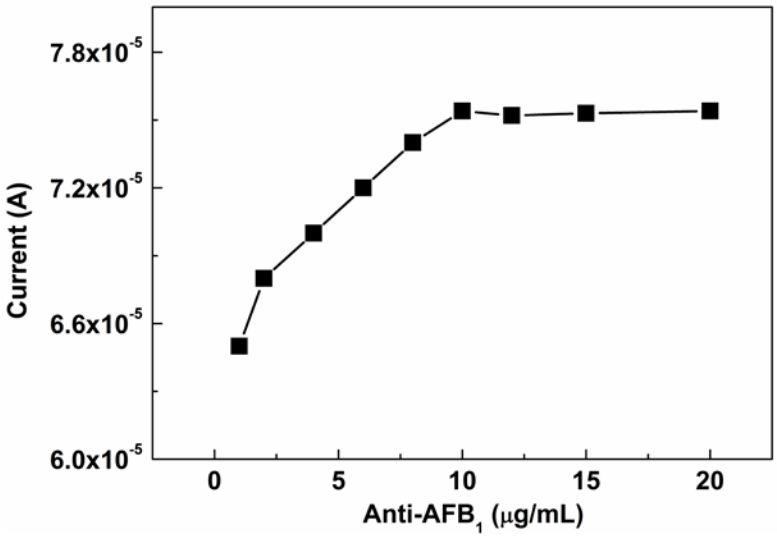

Fig. S6: Response current of BSA-*anti*-AFB_1/RGO/ITO immunoelectrode with 25 ng/dL AFB_1 concentration, as a function of number of days.

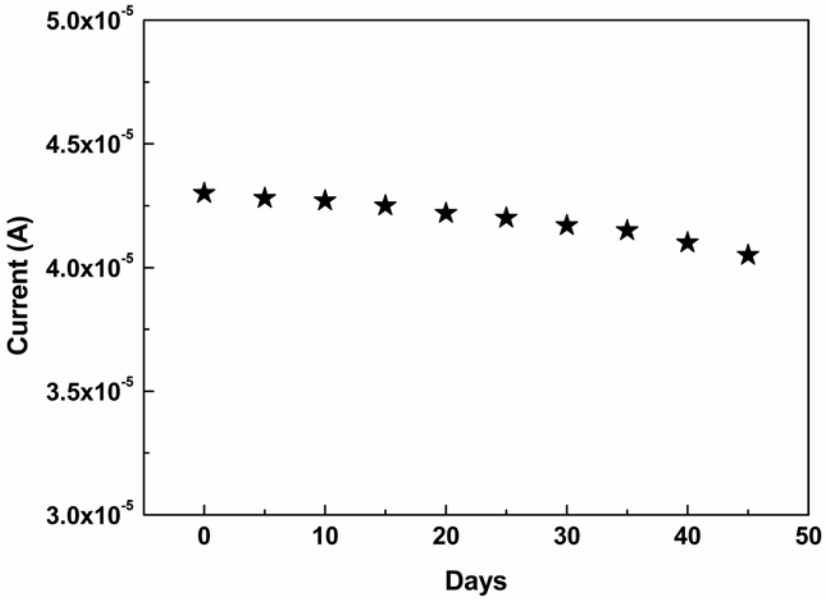

Table S1: The C 1s peak position and the relative atomic percentage of various functional groups present in the RGO/ITO and anti-AFB_1/RGO/ITO films.

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Sample	Fitting of the C 1s peak Binding energy [eV] (relative atomic percentage [%])						
	C-Mg	C-C	C-OH	C-O	C=O	O-C=O	N-C=O
RGO/ITO	282.3 (6.4)	284.5 (56.3)	285.6 (12.4)	286.6 (10.3)	287.9 (2.5)	289.6 (12)	-
anti-AFB_1/RGO/ITO	282.3 (6.2)	284.9 (55.8)	285.6 (7.5)	286.6 (8.8)	-	289.4 (0.6)	287.6 (21)

Table S2: Value of the equivalent circuit elements along with estimated error (%) for RGO/ITO, anti-AFB1/RGO/ITO and BSA/anti-AFB1/RGO/ITO electrodes obtained by nonlinear least square fitting method.

Equivalent circuit element		RGO/ITO electrode		*anti*-AFB_1/RGO/ITO electrode		BSA-*anti*-AFB_1/RGO/ITO electrode	
		Value	Estimated error (%)	Value	Est. error (%)	Value	Est. error (%)
R_{sol} (Ω)		289.6	1.278	364	1.85	305.6	1.218
Q	Y_o (Ω^{-1})	0.2129×10^{-5}	6.722	7×10^{-5}	0.410	0.1593×10^{-5}	3.184
	n	0.8265	1.043	0.8035	1.5	0.8574	0.535
R_{ct} (kΩ)		1.738	1.429	3.52	2.5	19.66	2.173
W (Ω)		0.2063×10^{-3}	1.195	0.187×10^{-3}	3	0.3099×10^{-4}	2.103