

Supplementary material

Voltammetric immunosensor to track a major peanut allergen (Ara h 1) in food products employing quantum dot labels

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Table S1. Time optimization of distinct assay strategies based on a combination of steps.

Strategy	Assay step				Assay Time (min)
	Blocker (min)	Target (min)	DAb (min)	QDs (min)	
i	30	60	60	30	180
ii	30	60		60	150
iii	30	60		30	120
iv	30		60		90
v	30	30		30	90
vi	--	30		30	60

Table S2. Studied and selected variables for the analysis of Ara h 1.

Experimental variable	Tested range	Selected value
[CAB] ($\mu\text{g}\cdot\text{mL}^{-1}$)	2.5 – 50	10
[DAb] (Dilution Factor)	100 – 500	250
t (Ara h 1 & DAb) (min)	30 – 60	30
t (QD-strep) (min)	0 – 30	30
C [QD-strep] (nM)	2.5 – 10	5.0
BSA addition to QD-strep (%)	0.5 – 2.0	2.0

Table S3. Analytical characteristics of the developed electrochemical immunosensor for the analysis of Ara h 1.

Figures of merit	Ara h 1
Concentration interval ($\text{ng}\cdot\text{mL}^{-1}$)	25 - 1000
Correlation coefficient (r)	0.998
Slope (m) ($\text{nA}/(\text{ng}\cdot\text{mL}^{-1})$)	1.82
Standard deviation of the slope (S_m) ($\text{nA}/(\text{ng}\cdot\text{mL}^{-1})$)	0.05
Intercept (b) (nA)	66
Standard deviation of the intercept (S_a) (nA)	22
Standard deviation of the linear regression ($S_{y/x}$)	36
Standard deviation of the method (S_{x0}) ($\text{ng}\cdot\text{mL}^{-1}$)	20
Coefficient of variation of the method (V_{x0}) (%)	6.1
Limit of detection (LOD) ($\text{ng}\cdot\text{mL}^{-1}$)	3.5
Limit of quantification (LOQ) ($\text{ng}\cdot\text{mL}^{-1}$)	12

Table S4. Results of the recovery studies.

Added (ng·mL ⁻¹)	Found (ng·mL ⁻¹)	Recovery (%)	RSD (%)
100	102	102	6.22
250	262	105	6.79
500	558	112	2.86
1000	1091	109	3.46

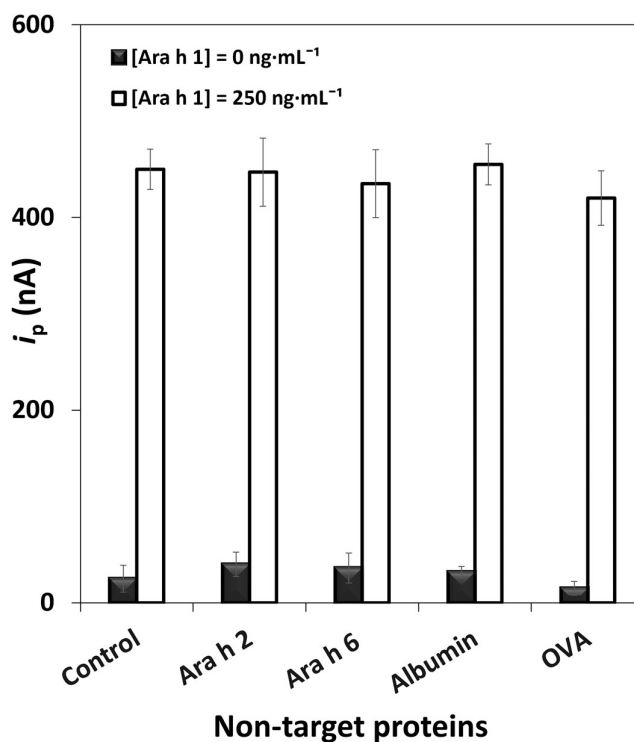


Figure S1. Results from the interference (light grey bars, Ara h 1: 250 ng·mL⁻¹) and selectivity (dark grey bars) studies using non-target proteins: Ara h 2 (5.0 ng·mL⁻¹), Ara h 6 (2.0 ng·mL⁻¹), albumin (55 mg·mL⁻¹), and OVA (100 mg·mL⁻¹).