Supplementary information

A bioinspired peptide in TIR protein as recognition molecule on electrochemical biosensors for the detection of E. coli O157:H7 in aqueous matrices

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Content

1. **Normalized current values for the detection of *E. coli* (500 CFU/mL) obtained from SWV results for the different time and applied potential used in AuNPs electrodeposition.**

Table S1. Normalized current values ($\Delta I_{Normalized}$) obtained from SWV results for the potential and time used in electrodeposition of AuNPs.

Time of electrodeposition	**Potential of electrodeposition**			
	+0.05 V	**-0.05 V**	**-0.15 V**	**-0.25 V**
20 s	0.210	0.166	0.280	0.187
100 s	0.339	0.389	0.072	0.002
250 s	0.306	0.561	-0.015	0.302

2. Evaluation of the reduction potential for the electrodeposition of AuNPs on screen-printed electrodes (SPE, Italsens).

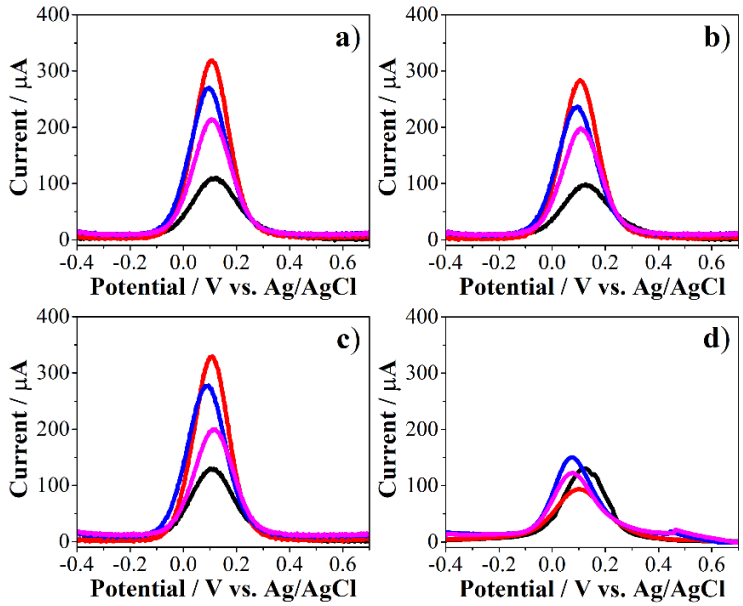

Figure S1. Results of SWV of the effect of the applied potential of +0.05 V (a), -0.05 V (b), -0.15 V (c) and -0.25 V (d) in chronoamperometry for AuNPs electrodeposition at a constant time of 20 s. The concentration of PEPTIR-1.0 and *E. coli* was 500 nM and 500 CFU/mL, respectively (concentrations used as reference). The curves correspond to SPE (black lines), SPE/AuNPs (red lines), SPE/AuNPs/PEP (blue lines) and SPE/AuNPs/PEP/EC (rose lines) in all cases. 10 mM $[Fe(CN)_6]^{-3}/[Fe(CN)_6]^{-4}$ in 0.1 M of KCl.

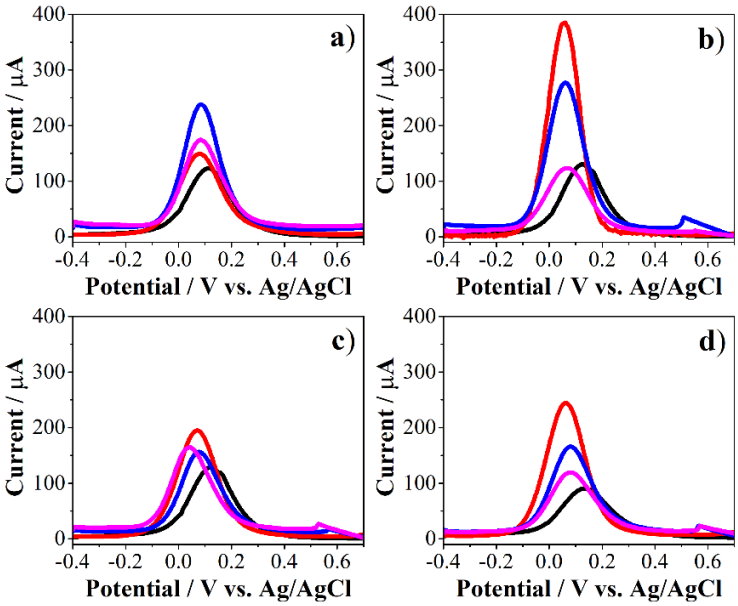

Figure S2. Results of SWV of the effect of the applied potential of +0.05 V (a), -0.05 V (b), -0.15 V (c) and -0.25 V (d) in chronoamperometry for AuNPs electrodeposition at a constant time of 250 s. The concentration of PEPTIR-1.0 and *E. coli* was 500 nM and 500 CFU/mL, respectively (concentrations used as reference). The curves correspond to SPE (black lines), SPE/AuNPs (red lines), SPE/AuNPs/PEP (blue lines) and SPE/AuNPs/PEP/EC (rose lines) in all cases. 10 mM $[Fe(CN)_6]^{-3}/[Fe(CN)_6]^{-4}$ in 0.1 M of KCl.

3. Negative control for the biosensor.

The negative control of the biosensor consists of a AuNPs-modified screen-printed electrode but without modification with PEPTIR-1.0. The results obtained are shown in Fig. S3.

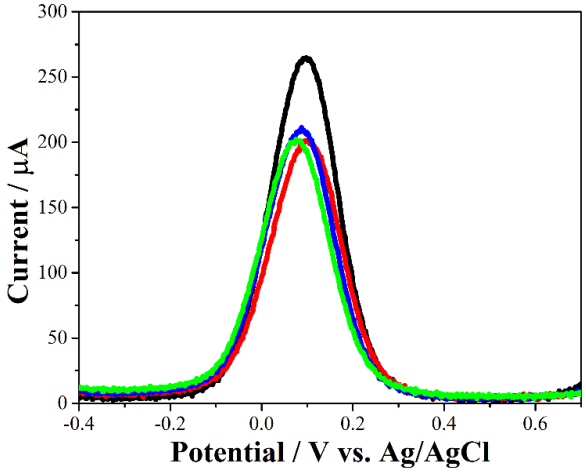

Figure S3. Results of SWV for the negative control of the biosensor. The curves correspond to SPE/AuNPs (black), SPE/AuNPs in blank of detection (PBS without *E. coli*, blue), SPE/AuNPs with 10 CFU/mL of *E. coli* (green) and SPE/AuNPs with 1000 CFU/mL of *E. coli* (red). Note that the PBS solution alone produces a change in the biosensor signal. Nevertheless, this signal is not affected by the presence of bacteria in the solution.

4. Selectivity of the biosensor towards the detection of E. coli.

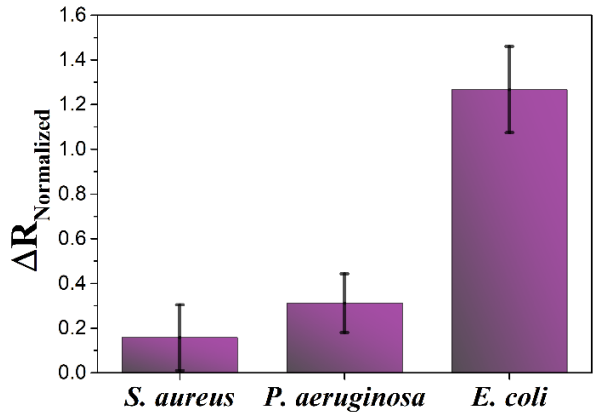

Figure S4. Normalized resistance values ($\Delta R_{Normalized}$) in the evaluation of the selectivity of the biosensor towards the detection of 50 CFU/mL of *E. coli*, *S. aureus* and *P. aeruginosa* bacteria.