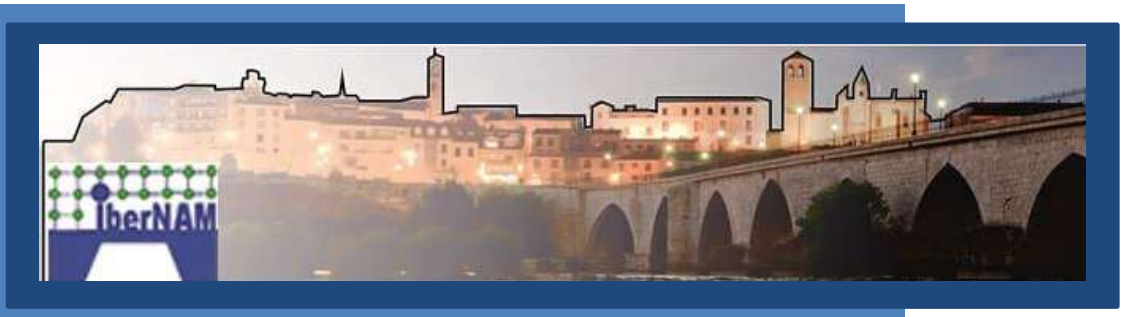

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UVA SENS

DIPUTACIÓN DE VALLADOLID

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P02. Optimization of the aptamers' immobilization conditions for maximizing the response of a dual-aptasensor for cancer biomarker detection

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Osteopontin (OPN) is a protein that is present in several body fluids and has been reported as a possible cancer biomarker, being its overexpression associated with tumour progression and metastasis [1,2]. A simple and sensitive method that allows the simultaneous detection of single or multiple cancer biomarkers is envisaged and may be an important tool in cancer diagnosis. In this work, two bioreceptors specific for OPN, a RNA aptamer (OPN-R3) previously described by Mi and co-workers [3] and a DNA aptamer (C10K2) developed by our research group, were biotinylated and immobilized on a dual-screen printed gold electrode through streptavidin-biotin interaction. The voltammetric signals generated by the dual-aptasensor array, after the formation of the aptamers-protein complex, were monitored using cyclic voltammetry (CV) and square-wave voltammetry (SWV), using $[Fe(CN)_6]^{-3/-4}$ as a redox probe. The optimal immobilization conditions for the dual-aptasensor array were established by response surface methodology. The maximum voltammetric response was obtained for a 0.5 μM aptamer concentration after 20 min of aptamers' immobilization and 30 min of aptamer-OPN interaction time at an incubation temperature of 4ºC. The satisfactory preliminary results obtained, although needing further confirmation for synthetic or real human samples, point out that the proposed electrochemical dual-aptasensor array could be a simple and sensitive tool for the detection of OPN, as well as for other potential cancer biomarkers and therefore, may be applied in the future for cancer disease monitoring.

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