



**XXI Encontro  
Sociedade Portuguesa  
de Eletroquímica**

**XVIII Encontro  
Ibérico  
de Eletroquímica**

**XXI Meeting of the Portuguese Electrochemistry Society  
&  
XVIII Iberian Electrochemistry Meeting  
Abstract Book**

**XXI Encontro da Sociedade Portuguesa de Eletroquímica  
&  
XVIII Encontro Ibérico de Eletroquímica  
Livro de Resumos**

**Bragança, Portugal ◊ 14-17 setembro 2016**



## Title

XXI Meeting of the Portuguese Electrochemistry Society &  
XVIII Iberian Electrochemistry Meeting

## Título

XXI Encontro da Sociedade Portuguesa de Eletroquímica &  
XVIII Encontro Ibérico de Eletroquímica

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### Electrochemical aptasensor array for multiple detection of human osteopontin .

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Most cancer diseases are associated with the presence of several biomarkers, as the proteins. The proteins, when overexpressed in biological fluids could be used as potential diagnostic or prognostic markers indicative of disease states [1,2]. Osteopontin (OPN) is a phosphorylated glycoprotein and has been reported as a potential breast cancer biomarker, its overexpression may be indicative of tumor formation, cancer progression, metastasis and poor prognosis [3–6]. An early diagnosis of the disease is of utmost importance to improve the patient's survival rate and therapeutic efficacy, as well as to monitor the disease recurrence. In this sense, it is essential to develop new, simple and cost-effective methods holding a high sensitivity and reliability for the simultaneous detection of multiple protein disease biomarkers in biological fluids [7]. The electrochemical multi-aptasensors arrays has recently attracted attention for the detection of various proteins disease biomarkers, due to their advantages, such as high sensitivity, specificity, fast detection, easier experimental procedures, lower cost preparation and the potential for miniaturization, as well as advantages of aptamers as bioreceptors elements such as high affinity and specificity towards a specific target, easy to produce and synthesize, good stability and amenable to chemical modification [8–10]. This study describes the development of an electrochemical multi-aptasensor array for the simultaneous detection of human OPN using two specific aptamers. To enable multiplexed protein assay, the RNA and DNA aptamers were immobilized in the working electrodes of the dual-screen-printed gold working electrodes (dual-SPGEs) via streptavidin-biotin interaction and using the  $[\text{Fe}(\text{CN})_6]^{3-/4-}$  as the redox probe for cyclic voltammetry (CV) measurements. The preliminary results herein report showed a good response of the multi-aptasensor array for the detection of human OPN. Moreover, the DNA/RNA multi-aptasensor array was able to selectively detect human OPN in the presence of other interfering proteins such as thrombin, bovine serum albumin, bovine osteopontin and lysozyme. Considering these preliminary results, the multi-aptasensor array holding the two aptamers could be a good alternative for the specific detection of human OPN and for cancer diagnosis overall.

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## CERTIFICADO

A Comissão Organizadora do  
**XXI Encontro da Sociedade Portuguesa de Eletroquímica**  
&

**XVIII Encontro Ibérico de Eletroquímica**  
que decorreu nos dias 14 a 17 de Setembro de 2016,  
no Instituto Politécnico de Bragança, Portugal,  
informa que a

**Comunicação oral**  
intitulada

**Electrochemical aptasensor array for multiple detection of human  
osteopontin.**

e com o(s) autor(es)

**Sofia G. Meirinho, Luís G. Dias, António M. Peres, Lígia R. Rodrigues**  
foi apresentada.

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