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Editors:
Caue Ribeiro
Odílio Benedito Garrido de Assis
Luiz Henrique Capparelli Mattoso
Sergio Mascarenhas

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Label-free impedimetric immunosensor for citrus canker

A. S. Afonso[(1)*], R. C.Faria [(1)], B. F. Zanetti[(2)], A. C. Santiago[(2)], F. H. Silva[(2)], L. H. C. Mattoso[(3)]

(1) Department of Chemistry, Federal University of São Carlos, São Paulo, Brazil*.
(2) Department of Genetic and Evolution, Federal University of São Carlos, São Paulo, Brazil.
(3) EMBRAPA, São Carlos, São Paulo, Brazil.
*Corresponding author

Abstract –In this work impedimetric immunosensor was developed for the detection of cysteine protease that plays an important role in the pathogenic organism and can be related with appearance of *Xanthomonas axonopodis pv citri* in citrus species.

Label-free electrochemical impedance immunosensor for the detection of protein cysteine protease CPXAC using self-assembly modified gold polycrystalline were developed. That protein is an enzyme that plays an important role in the pathogenic organisms, for instance, *Xanthomonas axonopodis pv citri*. This bacterium is responsible for citrus canker[1], an infection affecting citrus species and appearance of the organism can be related with arising of the CPXAC in leaves, stems and fruits. Then this protein may be a target for detection that bacterium. So, the immunosensor was developed using self-assembly modified gold polycrystalline, the antibody anti-CPXAC was immobilize onto self-assembly of the 3-mercaptopropanoic in gold using EDC/NHS. Afterwards, the antibody-modified electrodes were treated with glycine and milk to blocked non-reacted and non-specific SAM sites. The biosensor was build and which step of the developed immunosensors was accomplished through the monitoring of the electron-transfer resistance detected by electrochemical impedance spectroscopy (EIS) in the presence of $[Fe(CN)_6^{3-}]/[Fe(CN)_6^{4-}]$ as redox probe figure 1. The interaction of protein and your antibody was carried out in ambient temperature for 1h on the electrode and was detected that protein ranging from 2,12µg/mL to 530ng/mL increase values of the Zreal figure 2, but when used other protein not specific was not observed change of the Zreal suggesting specificity to the biosensor. Finally, these results showed that immunosensor have great potential for detect *Xanthomonas axonopodis pv citri* in citrus species.

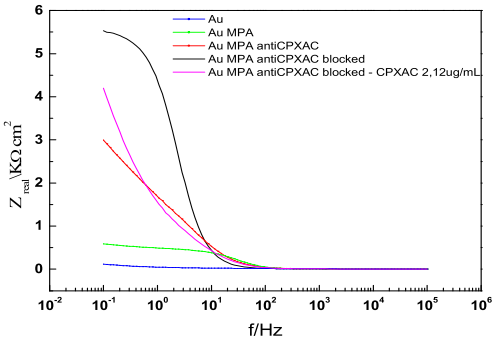

Figure 1: Plot Z_{real} vs F. The stepwise assembly of the developed immunosensors.

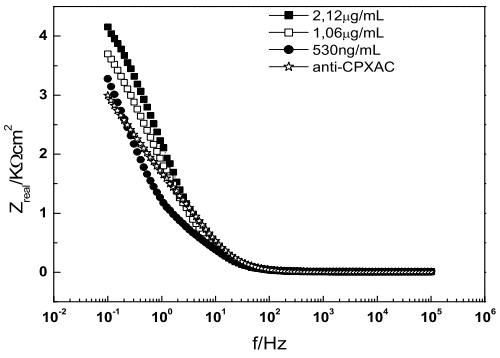

Figure 2: Plot Z_{real} vs F. Different concentration of CPXAC.

References

[1] Madden, J. C. Clark, V. L. Kuramitsu , K.H. Infect. Immun.,63 (1995) 238-247.