

## **Development of Films Containing Polymeric Nanofibers for Early Detection of the CA19-9 biomarker**

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The biomarker carbohydrate antigen 19-9 (CA19-9) is a protein class of mucins approved by the US Food and Drug Administration (FDA) to detect pancreatic cancer. The CA19-9 is used to differentiate benign and malignant tumors, and to determine its size, metastasis and patient life time according to its concentration in blood. The CA19-9 can be detected with an immunosensor made of polymeric film nanostructured through molecular recognition between the biomarker and its corresponding antibody. This early detection is valuable to determine the response to treatment with chemotherapy and monitor disease progression. Therefore, the determination of CA19-9 levels in tumor cells provides diagnostic information, prognostic and treatment. In this work was fabricated a immunosensors based on anti-CA19-9 immobilized on nanostructured films. The architecture of the immunosensor was based on a surface of tin oxide doped with indium (ITO) modified with nylon nanofibers (PA6), followed by immobilization of gold nanoparticles or carbon nanotubes on the surface layer of the antibody CA19-9. The surface of this film was optimized for scanning electron microscopy (SEM). Detection of CA19-9 antigen was performed with Electrochemical Impedance Spectroscopy (EIS), whose results were treated with information visualization methods, called PEx Sensors software. The detection limit estimated from the linear part of the concentration curve against impedance CA19-9 was very sensitive, so it can be used for early diagnosis.

[1] A. C. Soares, J.C. Soares, F.M.Shimizu, M. Melendez, A.L.Carvalho, O.N. Oliveira Jr. ACS Applied Materials & Interfaces, 7, (2015) 25930.