A NEW DEVICE FOR DETECTING LEISHMANIASIS BASED ON NANOSTRUCTURED POLYANILINE DEPOSITED ON POLYESTER SUBSTRATES

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Flexible films of intrinsically conductive polymers can serve as promising platforms for the development of novel multifunctional materials. In this sense, they could contribute for the progressive miniaturization of electronic or optical devices used to detect environmental pollutants or valuable biomacromolecules such as nucleic acids, and antibodies. In this work, we have prepared nanostructured films of polyaniline (PANI) deposited on polyester foils (FILIPERSON) and evaluated their physical-chemical properties and morphological features through UV-Vis spectroscopy, contact angle measurements and scanning electron microscopy. The results revealed that the nanostructured PANI particles were formed during the synthesis (which occurred under low temperature and dilute concentrations conditions) were uniformly deposited and that the wettability properties of them could be adjusted through controlled changes of pH. Our strategy to develop a platform for detecting infectious diseases consisted in first immobilizing a specific DNA probe atop the PANI film and then depositing over it the sample containing the target DNA sequence to be identified (of the leishmanial parasite in our test case). To check how efficient would be this methodology, we employed a commercial DNA dye (Sybr Green, ThermoFisher) that exhibits an enhanced fluorescence when in presence of double stranded DNA chains. We were able to optimize the procedure and then use UV-Vis spectroscopy and fluorescence microscopy to confirm the occurrence of the effective hybridization of the target DNA with the immobilized DNA probe. The preliminary results indicate that this platform appears as a promising methodology for the development of rapid diagnosis of infectious or genetic diseases.