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23402 | Detecting *Candida spp*. through an innovative genosensor

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Background & Aim: *Candida* spp. is the second most common cause of invasive fungal infection in hematopoietic stem cell transplantation (HSCT) patients and are associated with high mortality rates, ranging from 40 to 90%. Timely and accurate diagnosis is crucial for successful HSCT treatment. Current diagnostic methods, relying on conventional approaches, have limitations. Molecular and serological tests, although accurate, are time demanding and require specialized equipment. Biosensors are promising tools for point-of-care applications due to their low cost, ease of use and fast results. A low-cost electrochemical genosensor was developed for *C. albicans* detection. **Methods**: The genosensor construction required a DNA oligonucleotide sequence specific to *C. albicans*. A 90 bp synthetic DNA fragment was selected to identify this species. The sequence was cut into two fragments: a 25 bp DNA-capture probe and a 65 bp DNA-signaling probe. Screen-printed gold electrodes (SPGE) served as the electrochemical transducer. The sensor design included pretreatment, sensing, sandwich hybridization, and electrochemical detection. SPGE were pretreated with ethanol and ultrapure water. The sandwich assay, the DNA-capture probe bonded to the target DNA, then was immobilized on the working electrode overnight. A SAM interface with capture probes and 6-mercapto-1-hexanol was used to ensure probe orientation. Sandwich hybridization improved selectivity by binding the target with a fluorescein-labeled probe. The anti-fluorescein antibody was conjugated with horseradish peroxidase, and the oxidized product was detected by chronoamperometry. **Results**: Preliminary results show that the sensor was able to detect the synthetic of *C. albicans* DNA with high selectivity and sensitivity. Further studies will be made to enhance sensitivity parameters. **Conclusions**: The developed biosensor, with high sensitivity and selectivity, could provide a portable, user-friendly, and low-cost tool for monitoring fungal infections in HSCT recipients.

Keywords: *Candida spp*, Genosensor, Biosensors, Fungi.

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