

Electrochemical immunosensor to detect strongyloidiasis in serum

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Strongyloidiasis is a neglected tropical disease caused by the nematode *Strongyloides stercoralis*, affects approximately 100 million individuals worldwide and can lead to death in cases of dissemination due to hyperinfection. Laboratory findings are usually nonspecific and immunodiagnostic tests have limitations due to cross reactions. To overcome diagnostic problems improving sensitivity and specificity we developed an electrochemical immunosensor using as antigen a successfully tested antigenic fraction, previously obtained and validated by ELISA (enzyme linked immunosorbent assay) and immunoblotting, the detergent fraction from *Strongyloides venezuelensis*. Diagnostic efficiency was evaluated by testing 124 serum samples divided in pools: patients with confirmed strongyloidiasis (n=40), patients infected with other parasitic diseases (n=44) and healthy individuals from an endemic area for strongyloidiasis (n=40). The detergent fraction was immobilized on the gold working electrode on the immunosensor surface (BT 220). After, unspecific binding sites were blocked by adding bovine serum albumin and serum samples diluted 1:80 were added. After incubation period the electrode was washed and differential pulse voltammetry (DPV) was done. Atomic force microscopy (AFM), an exceptional tool for the characterization of the atomic binding forces of ligand–receptor interactions was used to observe modifications at sensor surface after antigen immobilization and after antigen-antibody interaction. Results from DPV showed that detergent fraction was able to distinguish strongyloidiasis patients from those with other parasitic diseases or healthy individuals during electrochemical detections when an increase on resistivity was observed. AFM demonstrated modifications on electrode surface roughness after each step of the reaction confirming the ability of the detergent fraction to distinguish strongyloidiasis patients from control groups. For the first time, a very simple electrochemical immunosensor was proposed for strongyloidiasis diagnosis with a gold electrode proving to be a sensitive and specific diagnostic tool potentially applicable for the diagnosis of human strongyloidiasis.

Keywords: eletrochemical immunosensor, diagnosis, strongyloidiasis, serum.

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