Detection of Salmonella enterica Dt104 and Vibrio cholera O134 using Polyclonal Antibodies Immobilized on Conducting Polyaniline Nanowires

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In this project we have investigated conducting polyaniline nanowires based biosensor to detect Salmonella entrica DT104 and Vibrio cholera O139 by converting antigen-antibody binding event into electrical signals. The synthesis of polyaniline nanowires was based on mixing aqueous solution of aniline hydrochloride and ammonium peroxydisulphate at room temperature. Firstly, the polyclonal antibodies that were synthesised by immunised chickens with Salmonella entrica DT104 and Vibrio cholera O139 obtained from Kenya Veterinary Vaccine Production Institute (KEVEVAPI) which were purified using DEAE and ammonium sulphate precipitation. These antibodies were immobilised on the porous nitrocellulose membrane due to its high adsorption property. Then the analyte containing single type bacteria and a mixture of the two were tested. The architecture biosensor operated by converting binding events between antigen and antibody into a measurable electrical signal. The antibodies were mixed and patterned at different spatial locations of biosensor and the response was configured to detect either one or a mixture of the antigen present in the analyte. Data obtained after experiments showed electrical signals which validated the architect pure of biosensor

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