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Research abstract

Nanobiosensor for Detection of *Salmonella* in Spinach (*Spinacia Oleracea*) by FTIR Spectroscopy

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Abstract: FTIR spectroscopy has been used to evaluate the concentration of *Salmonella* in spinach by using nanoparticles functionalized with specific antibodies. Nanoparticles (AuNP's) were synthesized by chemical reduction method and protein A was used as stabilizing agent. A next conjugate structure was obtained by adding a polyclonal anti-*salmonella* FITC antibody to give recognition and specificity to the bacteria *salmonella*. The construction of the conjugated arrangement was proved in samples of water from spinach intentionally contaminated with *Salmonella* with concentration of 3×10^5 UFC/ml. FTIR spectra of spinach show characteristic bands associated to the CO, OH and CH bonds, whereas the spectra of AuNP's show peaks at 1589 cm^{-1} and 1403 cm^{-1} . The spectrum of the conjugate shows the amide I band at 1660 cm^{-1} which arises from the protein A. The spectrum of the array also shows similar characteristic bands of proteins, (amide I and amide II). After the interaction of the conjugate array (nanobiosensor) with the *Salmonella* from spinach intentionally contaminated, the antigen-antibody reaction enable the recognition of this pathogenic microorganism. The change of the line shape of the FTIR spectra makes possible the determination of *Salmonella*. This nanobiosensor could be used as a simple and selective method.

Keywords: nanoparticles, *Salmonella*, FTIR spectroscopy

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