



GOLD NANOPARTICLES CONJUGATED WITH ANTIBODIES FOR DETECTION OF PATHOGENIC MICROORGANISMS IN FOOD

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Key words: nanoparticles, antibody, Raman scattering

Introduction. In recent years, the use of nanoparticles, particularly metal nanoparticles has expanded in biomedical research (1). Gold nanoparticles (AuNPs) have gained increasing interest due to their special features. These properties have been used to develop biosensors. The conjugation of antibodies to nanoparticles can generate a product that combines the properties of both. For example, they can combine the small size of nanoparticles with the abilities of antibodies, such as specific and selective recognition. The hybrid product will show versatility and specificity (2).

In this work, we report the conjugation of some typical antibodies to the surface of the nanoparticles.

Methods. Citrate-reduction method to produce gold nanoparticles was used. For the binding of protein A is using a validation method and the bioconjugation with antibody to the surface gold nanoparticles we used a protocol. For characterization of the conjugates we have used UV-visible and Raman scattering spectroscopy.

Results. Typical appearance of the nanoparticles is observed in the TEM image shown in Figure 1, having for this case an average particle size of 20 nm. Figure 2 shows a UV-visible spectrum of PA and IgG conjugated to the surface of gold nanoparticles, also is observed a shift to higher wavelengths. Figure 3 shows the Raman spectra of the gold nanoparticles, and the conjugated AuNPs -PA. SERS effect is observed for the AuNPs -PA-IgG system.

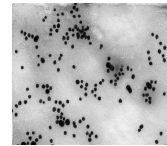


Fig.1 TEM image of gold nanoparticles analyzed in this work.

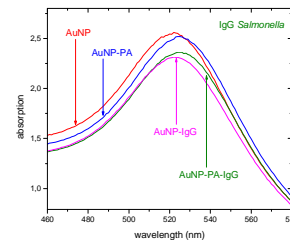


Fig.2 Absorption spectra of AuNPs with and without protein A conjugated with anti salmonella antibody.

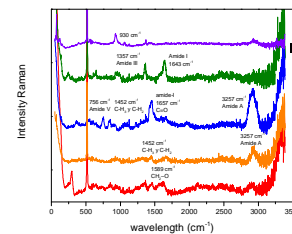


Fig.3 Raman spectrum of AuNPs (red), standard protein A (orange) and standard antisalmonella Ab (purple) and SERS spectrum of bioconjugates AuNPs - Prot A (blue) and AuNPs -Prot A -antisalmonella Ab (green).

Conclusions The binding of the antibody to the surface of the nanoparticle was observed through a shift to longer wavelengths of the visible UV absorption, and also by the presence of characteristic SERS bands.

Thanks. This research was conducted with support from the project SIP2012.

References

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