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Bilinear *Staphylococcus aureus* Detection Based on Suspension Immunoassay

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Abstract

A novelty bilinear suspension immunoassay biosensor is developed for *Staphylococcus aureus* specific detection. In the present study, a dual-color-based sandwich immunosensor was constructed for sensitive and selective detection of this bacterium. In this bioassay system, the monoclonal antibodies of *Staphylococcus aureus* were immobilized on carboxyl-modified fluorescent microspheres (PSA-R6G) which acted as a capture probe. A secondary fluorescein isothiocyanate (FITC)-labelled antibody of *Staphylococcus aureus* acted as a sensitive reporter antibody. After dual-labelling with R6G and FITC, the enriched *Staphylococcus aureus* bacteria were observed by using the multiparameter flow cytometry analysis. In this method, two regression equations were obtained with $I_{\text{FITC}}=1.56\lg C+4.50$ and $I_{\text{R6G}}=1.54\lg C+2.78$, respectively. It can be noted that the two slopes were very similar, which indicated the false positives decrease significantly. For general applications, the quantificational measurements of *Staphylococcus aureus* in milk and water samples were also carried out. The suspension immunoassay exhibited an excellent specificity to *Staphylococcus aureus* in contrast to conventional culture-based method.

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