Short Communication

Piezoelectric Immunosensor for the Determination of C-Reactive Protein

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C-reactive protein (CRP) is a common biomarker of inflammatory processes and it typically serves for the distinguishing of bacterial and viral diseases. It is typically measured in the blood, plasma or serum by immunoassay like agglutination or enzymatic immunoassays. In this paper, a new immunoassay based on a piezoelectric biosensor was introduced. QCM with basic frequency of oscillations 10 MHz and gold electrodes served as a platform and it was modified with antibodies against CRP and silica nanoparticles. Separately, antibody functionalized silica nanoparticles were prepared and they further served for signal amplification. CRP was assayed with limit of detection equal to 0.080 mg/l. The assay was successfully validated to standard ELISA method and no significant interference by IgM, TNF α and albumin was observed. The biosensor-based assay appears to be practically applicable and can serve for routine diagnosis purpose.

Keywords: affinity; antibody; biosensor; CRP; C-reactive protein; immunosensor; infection; inflammation; label free assay; liver; piezoelectric; quartz crystal microbalance

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