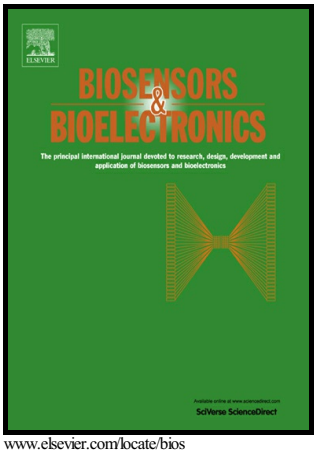

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Abstract

C-reactive protein (CRP) is a widely accepted biomarker of cardiovascular disease and inflammation. In this study, a RNA aptamer-based electrochemical sandwich type aptasensor for CRP detection was described using the functionalized silica microspheres as immunoprobes. Silica microspheres (Si MSs), which have good monodispersity and uniform shape, were firstly synthesized. The silica microspheres functionlized with gold nanoparticles (Au NPs) provided large surface area for immobilizing signal molecules (Zinc ions, Zn^{2+}) and antibodies (Ab). RNA aptamers, which were specific recognized to CRP, were assembled on the surface of Au NPs modified electrode via gold-sulfur affinity. In the presence of CRP, a sandwich structure of aptamer-CRP-immunoprobe was formed. Square wave voltammetry (SWV) was employed to record the sensing signal, and a clearly reductive peak corresponding to Zn^{2+} at about -1.16 V (vs. SCE) was obtained. Under optimal conditions, the aptasensor showed wide linear range (0.005 ng mL^{-1} to 125 ng mL^{-1}) and low detection limit (0.0017 ng mL^{-1} at a signal-to-noise ratio of 3). Some possible interfering substance was also