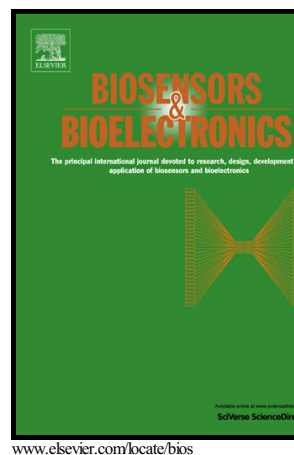


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A sensitive fluorescent sensor for quantification of alpha-fetoprotein
based on immunosorbent assay and click chemistry

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Abstract

A novel fluorescent immunosensor for determination of cancer biomarkers such as alpha-fetoprotein (AFP) was designed by utilizing both the high specificity of antigen-antibody sandwich structure and the high sensitivity of the click chemistry based fluorescence detection. Instead of an enzyme or fluorophore, the CuO nanoparticles are labelled on the detection antibody, which was not susceptible to the change of the external environments. The CuO nanoparticles which were modified on the sandwich structure can be dissolved to produce Cu²⁺ ions with the help of HCl and then the Cu²⁺ ions were reduced by sodium ascorbate to produce Cu⁺ ions which triggered the Cu⁺ catalyzed alkyne-azide cycloaddition (CuAAC) reaction between the weak fluorescent compound (3-azido-7-hydroxycoumarin) and propargyl alcohol to form a strong fluorescent compound. A good linear relationship was observed

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