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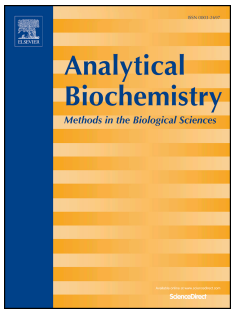

Helix structure of the double-stranded DNA for aptameric biosensing and imaging of cytochrome *c*

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Helix structure of the double-stranded DNA for aptameric biosensing and imaging of cytochrome c

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Abstract

Here, a method is introduced for construction the aptameric biosensor for biosensing detection of cytochrome C (CYC) based on chain-shape structure of aptasensor by using highly dispersed silver nanoparticles (AgNPs) on acid-oxidized carbon nanotube (CNTs) substrate. The animated capture probe (ssDNA1) and CYC-aptamer (ssDNA2) was immobilized on AgNPs/CNTs surface by covalent amide bonds formed by the carboxyl groups on the nanotubes and the amino groups on the oligonucleotides and hybridization, respectively. In this protocol, the nucleic acids at both ends of the ssDNA1 were sequenced to be complementary (tailor-made ssDNA1). The helix structure of the double-stranded DNA was fabricated by hybridizing ssDNA2 with its complementary sequence (ssDNA1). CYC-aptamer could be forced to dissociate from the sensing interface after CYC triggered structure switching of the aptamer and ssDNA1 thus tend to form a chain-shape structure through the hybridization of the complementary sequences at both its ends. The proposed assay permitted to detect CYC in the linear range of 0.01– 750 nM with a very low limit of detection (LOD) (1.66 pM). In addition, the specificity of this sensing system for the detection of CYC was also demonstrated by using albumin, fructose, myoglobin, and hemoglobin.

Keywords: Aptasensor, Cytochrome C, Helix structure, Silver nanoparticles.

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