

Impedimetric aptasensor for ochratoxin A determination based on Au nanoparticles stabilized with hyper-branched polymer.

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Abstract

An impedimetric aptasensor for ochratoxin A (OTA) detection has been developed on the base of a gold electrode covered with a new modifier consisting of electropolymerized Neutral Red and a mixture of Au nanoparticles suspended in the dendrimeric polymer Botlorn H30®. Thiolated aptamer specific to OTA was covalently attached to Au nanoparticles via Au-S bonding. The interaction of the aptamer with OTA induced the conformational switch of the aptamer from linear to guanine quadruplex form followed by consolidation of the surface layer and an increase of the charge transfer resistance. The aptasensor makes it possible to detect from 0.1 to 100 nM of OTA (limit of detection: 0.02 nM) in the presence of at least 50 fold excess of ochratoxin B. The applicability of the aptasensor for real sample assay was confirmed by testing spiked beer samples. The recovery of 2 nM OTA was found to be 70% for light beer and 78% for dark beer.
