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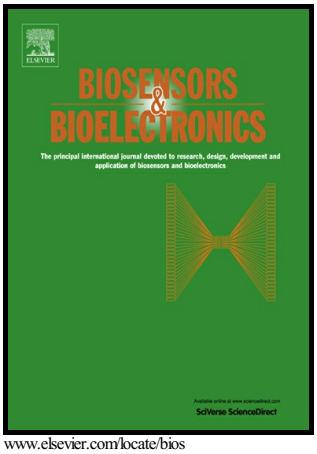

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PII: S0956-5663(16)30664-9
DOI: http://dx.doi.org/10.1016/j.bios.2016.07.035
Reference: BIOS8916

To appear in: *Biosensors and Bioelectronic*

Received date: 30 January 2016
Revised date: 6 June 2016
Accepted date: 11 July 2016

Cite this article as: Hua Xie, Qin Wang, Yaqin Chai, Yali Yuan and Ruo Yuan, Enzyme-assisted cycling amplification and DNA-templated *in-situ* deposition o silver nanoparticles for the sensitive electrochemical detection of Hg^{2+} *Biosensors and Bioelectronic,* http://dx.doi.org/10.1016/j.bios.2016.07.035

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Enzyme-assisted cycling amplification and DNA-templated *in-situ* deposition of silver nanoparticles for the sensitive electrochemical detection of Hg^{2+}

Hua Xie, Qin Wang, Yaqin Chai, Yali Yuan*, Ruo Yuan*

Key Laboratory of Luminescent and Real-Time Analytical Chemistry (Southwest University), Ministry of Education, College of Chemistry and Chemical Engineering, Southwest University, Chongqing 400715, PR China

Accepted manuscript

Abstract:

In this work, a label-free electrochemical biosensor was developed for sensitive and selective detection of mercury (II) ions (Hg^{2+}) based on *in-situ* deposition of silver nanoparticles (AgNPs) on terminal deoxynucleotidyl transferase (TdT) extended ssDNA for signal output and nicking endonuclease for cycling amplification. In the presence of target Hg^{2+}, the T-rich DNA (HP1) could partly fold into duplex-like structure (termed as output DNA) *via* T-Hg^{2+}-T base pairs and thus exposed its sticky end. The sticky end of output DNA could then hybridize with 3′-PO_4 terminated capture DNA (HP2) on electrode surface to form output DNA-HP2 hybridization complex with the sequence 5′-CCTCAGC-3′/3′-GGAGTCG-5′ (the sequence could be recognized by nicking endonuclease Nt.BbvCI). With the introduction of Nt.BbvCI, output DNA existed in hybridization complex was released from electrode and participated in the next hybridization process, accompanying with

* Corresponding author. Tel.: +86-23-68252277; Fax: +86-23-68253172.

E-mail address: y198688@swu.edu.cn (YL. Yuan); yuanruo@swu.edu.cn (R. Yuan)

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