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Yongmei Wu, Lina Zou, Sheng Lei, Qian Yu, Baoxian Ye



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**Highly sensitive electrochemical thrombin aptasensor
based on peptide-enhanced electrocatalysis of
hemin/G-quadruplex and nanocomposite as nanocarrier**

Yongmei Wu, Lina Zou, Sheng Lei, Qian Yu, Baoxian Ye^{*}

College of Chemistry and Molecular Engineering, Zhengzhou University, Zhengzhou
450001, P R China

Abstract:

In this work, we first conjugated a short peptide to thrombin binding aptamer (TBA) and bond hemin to the hybrid, effectively rendering hemin/G4-peptide more active over the original hemin/G4, so that a highly sensitive electrochemical thrombin (TB) aptasensor was developed based on it and PtNTs@rGO nanocomposite. It was the first report on the application of hemin/G4-peptide in electrochemical aptasensor. PtNTs@rGO with large surface area served as excellent nanocarrier for high loading of hemin/G4-peptide hybrids, resulting in the formation of hemin/G4-peptide–PtNTs@rGO bioconjugate as the secondary aptamer and further signal enhancement. The specific affinity of aptamer for target TB made the secondary aptamer go into the sensing interface, and then a noticeable current signal was obtained from hemin without additional redox mediators. Due to the collaborative electrocatalysis of hemin/G4-peptide and PtNTs toward H_2O_2 , which was formed in situ during the process of hemin/G4-peptide-catalyzed oxidation of NADH with dissolved O_2 , the

^{*} Corresponding author. Tel.: +86-0371-67781757; fax: +86-0371-67763654.

E-mail address: yebx@zzu.edu.cn (B. X. Ye).

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