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Limin Guo, Qiang Zhao



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Thrombin-Linked Aptamer Assay for Detection of Platelet Derived Growth Factor BB on Magnetic Beads In a Sandwich Format

Limin Guo^{a,c}, Qiang Zhao^{a,b*}

^aInstitute of Environmental Science, College of Chemistry and Chemical Engineering, Shanxi University, Taiyuan, 030006, China.

^bState Key Laboratory of Environmental Chemistry and Ecotoxicology, Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, Beijing, 100085, China.

^cSchool of Chinese Materia Medica, Shanxi University of Traditional Chinese Medicine, Taiyuan, 030024, China.

qiangzhao@rcees.ac.cn

chemzhaoq@hotmail.com

*Corresponding author. Tel./fax: +86 10 62849892.

Abstract

Here we describe a thrombin-linked aptamer assay (TLAA) for protein by using thrombin as an enzyme label, harnessing enzyme activity of thrombin and aptamer affinity binding. TLAA converts detection of specific target proteins to the detection of thrombin by using a DNA sequence that consists of two aptamers with the first aptamer binding to the specific target protein and the second aptamer binding to thrombin. Through the affinity binding, the thrombin enzyme is labeled on the protein target, and thrombin catalyzes the hydrolysis of small peptide substrate into product, generating signals for quantification. As a proof of principle, we show a sandwich TLAA for platelet derived growth factor BB (PDGF-BB) by using anti-PDGF-BB antibody coated on magnetic beads and an oligonucleotide containing the aptamer for PDGF-BB and the aptamer for thrombin. The binding of PDGF-BB to both the antibody and the aptamer results in labeling the complex with thrombin. We achieved detection of PDGF-BB at 16 pM. This TLAA contributes a new application of

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