

Author's Accepted Manuscript

A novel fluorescent biosensor for Adenosine Triphosphate detection based on the polydopamine nanospheres integrating with enzymatic recycling amplification

Xiaoting Ji, Bingqing Yi, Yujuan Xu, Yanan Zhao, Hua Zhong, Caifeng Ding



PII: S0039-9140(17)30343-0
DOI: <http://dx.doi.org/10.1016/j.talanta.2017.03.052>
Reference: TAL17397

To appear in: *Talanta*

Received date: 6 January 2017
Revised date: 8 March 2017
Accepted date: 16 March 2017

Cite this article as: Xiaoting Ji, Bingqing Yi, Yujuan Xu, Yanan Zhao, Hua Zhong and Caifeng Ding, A novel fluorescent biosensor for Adenosine Triphosphate detection based on the polydopamine nanospheres integrating with enzymatic recycling amplification, *Talanta*, <http://dx.doi.org/10.1016/j.talanta.2017.03.052>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain

A novel fluorescent biosensor for Adenosine Triphosphate detection based on the polydopamine nanospheres integrating with enzymatic recycling amplification

Xiaoting Ji, Bingqing Yi, Yujuan Xu, Yanan Zhao, Hua Zhong, Caifeng Ding*

Key Laboratory of Sensor Analysis of Tumor Marker, Ministry of Education, College of Chemistry and Molecular Engineering, Qingdao University of Science and Technology. Qingdao 266042, P.R. China.

*Corresponding author. Caifeng Ding, College of Chemistry and Molecular Engineering, Qingdao University of Science and Technology. Qingdao 266042, P.R. China, dingcaifeng2003@163.com

Abstract

Based on the protective performance of polydopamine nanospheres (PDANSs) for DNA against nuclease digestion and the specific recognition characteristic of aptamer, we have developed an enzymatic recycling signal amplification method for highly sensitive and selective detection of adenosine triphosphate (ATP). Fluorescence measurements were carried out to verify the DNA polymerase and exonuclease III (Exo III) assisted target recycling process and fluorescence signal amplification. In the absence of the ATP, initially, the signal DNA-PDANSs complex was in the “off” state due to the efficient fluorescence quenching of 6-carboxyfluorescein (FAM) adjacent to the surface of PDANSs. Due to the binding of the aptamer by ATP, it trigger DNA polymerase and Exo III assisted target recycling process by the product of release, the complex would change into the “on” state as a result of the dissociation of the FAM from the surface of PDANSs, thus providing greatly enhanced fluorescence emission intensity. The method allows quantitative detection of ATP in the range of 20

Download English Version:

<https://daneshyari.com/en/article/5140933>

Download Persian Version:

<https://daneshyari.com/article/5140933>

[Daneshyari.com](https://daneshyari.com)