

Novel photoluminescence enzyme immunoassay based on supramolecular host-guest recognition using L-arginine/6-aza-2-thiothymine-stabilized gold nanocluster

Youmei Wang, Minghua Lu, Dianping Tang



PII: S0956-5663(18)30173-8
DOI: <https://doi.org/10.1016/j.bios.2018.03.007>
Reference: BIOS10333

To appear in: *Biosensors and Bioelectronics*

Received date: 5 January 2018
Revised date: 22 February 2018
Accepted date: 4 March 2018

Cite this article as: Youmei Wang, Minghua Lu and Dianping Tang, Novel photoluminescence enzyme immunoassay based on supramolecular host-guest recognition using L-arginine/6-aza-2-thiothymine-stabilized gold nanocluster, *Biosensors and Bioelectronics*, <https://doi.org/10.1016/j.bios.2018.03.007>

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.

Novel photoluminescence enzyme immunoassay based on supramolecular host-guest recognition using L-arginine/6-aza-2-thiothymine-stabilized gold nanocluster

Yumei Wang^a, Minghua Lu^{a*}, Dianping Tang^b

^a*Institute of Environmental and Analytical Science, School of Chemistry and Chemical Engineering, Henan University, Kaifeng 475004, Henan, PR China*

^b*MOE Key Laboratory of Analytical Science for Food Safety and Biology, Department of Chemistry, Fuzhou University, Fuzhou 350116, PR China*

minghualu88@yeah.net

mhlu@henu.edu.cn

*Corresponding author. Tel./fax.: +86 371 2338 1589

ABSTRACT

A new photoluminescence (PL) enzyme immunoassay was designed for sensitive detection of aflatoxin B₁ (AFB₁) via an innovative enzyme substrate, 6-aza-2-thiothymine-stabilized gold nanocluster (AAT-AuNC) with L-arginine. The enzyme substrate with strong PL intensity was formed through supramolecular host-guest assembly between guanidine group of L-arginine and AAT capped on the surface of AuNC. Upon arginase introduction, the captured L-arginine was hydrolyzed into ornithine and urea, thus resulting in the decreasing PL intensity. Based on this principle, a novel competitive-type immunoreaction was first carried out on AFB₁-bovine serum albumin (AFB₁-BSA) conjugate-coated microplate, using arginase-labeled anti-AFB₁ antibody as the competitor. Under the optimum conditions, the PL intensity increased with the increment of target AFB₁, and allowed the detection of the analyte at concentrations as low as 3.2 pg mL⁻¹ (ppt). Moreover, L-arginine-AAT-AuNC-based PL enzyme immunoassay afforded good reproducibility and acceptable specificity. In addition, the accuracy of this methodology,

Download English Version:

<https://daneshyari.com/en/article/7229549>

Download Persian Version:

<https://daneshyari.com/article/7229549>

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