

## Accepted Manuscript

Title: Sensitive Electrogenenerated Chemiluminescence Aptasensor for the Detection of Ramos Cells Incorporating Polyamidoamine Dendrimers and Oligonucleotide

Author: Haiying Yang Qian Yang Zhejian Li Yingxin Du  
Chengxiao Zhang



PII: S0925-4005(16)30501-9  
DOI: <http://dx.doi.org/doi:10.1016/j.snb.2016.04.030>  
Reference: SNB 20004

To appear in: *Sensors and Actuators B*

Received date: 5-11-2015  
Revised date: 6-3-2016  
Accepted date: 6-4-2016

Please cite this article as: Haiying Yang, Qian Yang, Zhejian Li, Yingxin Du, Chengxiao Zhang, Sensitive Electrogenenerated Chemiluminescence Aptasensor for the Detection of Ramos Cells Incorporating Polyamidoamine Dendrimers and Oligonucleotide, *Sensors and Actuators B: Chemical* <http://dx.doi.org/10.1016/j.snb.2016.04.030>

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 proof before it is published in its final 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.

# Sensitive Electrogenenerated Chemiluminescence Aptasensor for the Detection of Ramos Cells Incorporating Polyamidoamine Dendrimers and Oligonucleotide

Haiying Yang<sup>a,b\*</sup> haiyingyang79@hotmail.com, Qian Yang<sup>c</sup>, Zhejian Li<sup>b</sup>, Yingxin Du<sup>b</sup>, Chengxiao Zhang<sup>b\*</sup> cxzhang@snnu.edu.cn

<sup>a</sup> Department of Chemistry, Yuncheng University, Yuncheng 044300, PR China

<sup>b</sup> Key Laboratory of Applied Surface and Colloid Chemistry, Ministry of Education, School of Chemistry and Chemical Engineering, Shaanxi Normal University, Xi'an 710062, PR China

<sup>c</sup> School of Physics & Information Technology, Shaanxi Normal University, Xi'an 710062, PR China

\* To whom correspondence should be addressed. Tel: +86-359-8594394. Fax: +86-359-2090378.

## Abstract

A sensitive electrogenerated chemiluminescence (ECL) aptasensor was developed for the detection of human Burkitt's lymphoma Ramos cells based on the cells-specific oligonucleotide TD05 served as a molecular recognition element and ruthenium(II) complex (Ru1) labeled polyamidoamine dendrimer (Dend) as a signal probe. Dend was used as platform to assemble substantial Ru1 and TD 05 to form Ru1-Dend-SH-(CH<sub>2</sub>)<sub>6</sub>-oligo(ethylene oxide)<sub>6</sub>-TD05 bioconjugate which was used as the signal probe. Dend was not only used as platform to assemble substantial Ru1 but also used as a coreactant of Ru1 to amplify the ECL signal. The biosensor platform was fabricated by covalently coupling the 52-mer amino-substituted oligonucleotide probes with carboxyl groups on single wall carbon nanotubes-coated glassy carbon electrode. With the sandwich assay, Ramos cells were selectively captured on the surface of the biosensor based on the specific affinity between aptamers and mIgM on the target cells surface, and then, the signal probe was bound with the captured cells. In the presence of tri-n-propylamine, the increased ECL intensity of the biosensor was logarithmically proportion to the concentration of Ramos cells over a range from  $1.0 \times 10^2$  to  $1.0 \times 10^4$  cells/mL with a detection limit of 55 cells/mL. It was found that the sensitivity of the biosensor increased 4.3-fold by comparison with that without Dend. And also, the ECL biosensor showed satisfied selectivity against the tested control cancer cells.

Download English Version:

<https://daneshyari.com/en/article/7143319>

Download Persian Version:

<https://daneshyari.com/article/7143319>

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