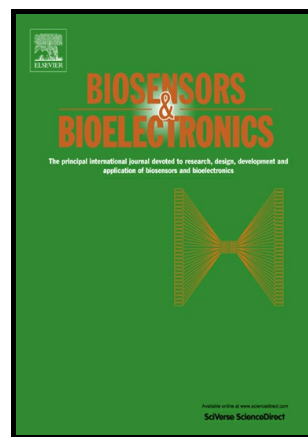


## Author's Accepted Manuscript

A Versatile Cathodic “Signal-on”  
Photoelectrochemical Platform Based on a Dual-  
Signal Amplification Strategy

Ying Li, Fengting Chen, Zhenzhu Luan, Xiaoru  
Zhang



PII: S0956-5663(18)30578-5  
DOI: <https://doi.org/10.1016/j.bios.2018.07.068>  
Reference: BIOS10657

To appear in: *Biosensors and Bioelectronic*

Received date: 4 June 2018  
Revised date: 27 July 2018  
Accepted date: 30 July 2018

Cite this article as: Ying Li, Fengting Chen, Zhenzhu Luan and Xiaoru Zhang, A Versatile Cathodic “Signal-on” Photoelectrochemical Platform Based on a Dual-Signal Amplification Strategy, *Biosensors and Bioelectronic*, <https://doi.org/10.1016/j.bios.2018.07.068>

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 Versatile Cathodic “Signal-on” Photoelectrochemical Platform Based on a Dual-Signal Amplification Strategy

Ying Li<sup>a</sup>, Fengting Chen<sup>a</sup>, Zhenzhu Luan<sup>b</sup>, Xiaoru Zhang<sup>b,c,\*</sup>

<sup>a</sup>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, PR China.

<sup>b</sup>Shandong Key Laboratory of Biochemical Analysis, College of Chemistry and Molecular Engineering, Qingdao University of Science and Technology, Qingdao 266042, PR China.

<sup>c</sup>Key Laboratory of Analytical Chemistry for Life Science in Universities of Shandong, College of Chemistry and Molecular Engineering, Qingdao University of Science and Technology, Qingdao 266042, PR China. E-mail address: zhangxr7407@126.com

**ABSTRACT:** Novel cathodic photoelectrochemical (PEC) aptasensors for sensitive and selective determination of thrombin and  $\text{Pb}^{2+}$  were developed based on a new dual-signal amplification strategy. The presence of gold nanoparticles (AuNPs) could quench the PEC signal of bismuth oxyiodide (BiOI). At the same time, the redox moiety G-quadruplex/hemin or ferrocene (Fc) was found to enhance the PEC signal of BiOI. So, in the presence of thrombin or  $\text{Pb}^{2+}$ , the interaction between target and the aptamer resulted in the releasement of the AuNPs, as well as shorter distance between the redox moiety and the electrode surface. Hence dual-enhanced cathodic PEC biosensor strategy was realized. Under the optimized conditions, the detection limits of thrombin and  $\text{Pb}^{2+}$  were 17.3 fM and 3.16 pM, respectively with good selectivity. At the same time, the PEC performance of redox moiety G-quadruplex/hemin and Fc was compared.

**Keywords:** photoelectrochemistry; cathodic photocurrent; thrombin;  $\text{Pb}^{2+}$

Download English Version:

<https://daneshyari.com/en/article/7228877>

Download Persian Version:

<https://daneshyari.com/article/7228877>

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