

Amperometric immunosensor for prolactin hormone measurement using antibodies loaded on a nano-Au monolayer modified ionic liquid carbon paste electrode

Hadi Beitollahi, Samira Nekooei, Masoud Torkzadeh-Mahani



www.elsevier.com/locate/talanta

PII: S0039-9140(18)30649-0
DOI: <https://doi.org/10.1016/j.talanta.2018.06.044>
Reference: TAL18786

To appear in: *Talanta*

Received date: 23 February 2018
Revised date: 9 June 2018
Accepted date: 12 June 2018

Cite this article as: Hadi Beitollahi, Samira Nekooei and Masoud Torkzadeh-Mahani, Amperometric immunosensor for prolactin hormone measurement using antibodies loaded on a nano-Au monolayer modified ionic liquid carbon paste electrode, *Talanta*, <https://doi.org/10.1016/j.talanta.2018.06.044>

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.

Amperometric immunosensor for prolactin hormone measurement using antibodies loaded on a nano-Au monolayer modified ionic liquid carbon paste electrode

Hadi Beitollahi^{a*1}, Samira Nekooei^b, Masoud Torkzadeh-Mahani^c

^a*Environment Department, Institute of Science and High Technology and Environmental Sciences, Graduate University of Advanced Technology, Kerman, Iran*

^b*Department of Chemistry, Graduate University of Advanced Technology, Kerman, Iran*

^c*Biotechnology Department, Institute of Science and High Technology and Environmental Sciences, Graduate University of Advanced Technology, Kerman, Iran*

E-mail: h.beitollahi@yahoo.com

ABSTRACT

The fabrication of a novel electrochemical immunosensor for rapid and precise determination of prolactin was carried out using carbon paste electrode (CPE) consist of ionic liquid (IL) and graphite. Gold nanoparticles were employed as a modifier on the surface of CPE to immobilize the prolactin antibody (anti-PRL). The immunoassay was set up by sandwiching the antigen between prolactin antibody and the polyclonal anti-human-prolactin antibody labeled with horseradish peroxidase (HRP-labeled anti-PRL) as secondary antibody, on the surface of modified CPE. The reaction between O-aminophenol (OAP) and H_2O_2 which is catalyzed by labeled HRP on the sandwich immunosensor generate a signal in differential pulse voltammetry (DPV) that is used to determine the concentration of prolactin. This immunosensor provides the measurement of prolactin concentration in a linear range of 25.0-2000.0 mIU L⁻¹ with a detection limit 12.5 mIU L⁻¹. Moreover, it is applicable in the clinical assay of prolactin due to its high sensitivity and acceptable stability.

Graphical abstract:

¹ Tel.: +98 3426226613, fax: +98 3426226617

Download English Version:

<https://daneshyari.com/en/article/7676490>

Download Persian Version:

<https://daneshyari.com/article/7676490>

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