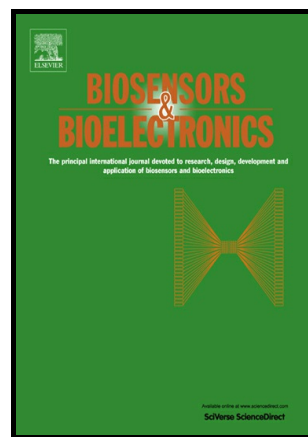


Probing the Specific Binding of Folic Acid to Folate Receptor using Amino-functionalized Mesoporous Silica Nanoparticles for Differentiation of MCF 7 Tumoral Cells from MCF 10A

Jafar Soleymani, Mohammad Hasanzadeh, Mohammad Hossein Somi, Nasrin Shadjou, Abolghasem Jouyban



PII: S0956-5663(18)30364-6
DOI: <https://doi.org/10.1016/j.bios.2018.05.025>
Reference: BIOS10483

To appear in: *Biosensors and Bioelectronics*

Received date: 4 February 2018
Revised date: 12 May 2018
Accepted date: 14 May 2018

Cite this article as: Jafar Soleymani, Mohammad Hasanzadeh, Mohammad Hossein Somi, Nasrin Shadjou and Abolghasem Jouyban, Probing the Specific Binding of Folic Acid to Folate Receptor using Amino-functionalized Mesoporous Silica Nanoparticles for Differentiation of MCF 7 Tumoral Cells from MCF 10A, *Biosensors and Bioelectronics*, <https://doi.org/10.1016/j.bios.2018.05.025>

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.

Probing the Specific Binding of Folic Acid to Folate Receptor using Amino-functionalized Mesoporous Silica Nanoparticles for Differentiation of MCF 7 Tumoral Cells from MCF 10A

Jafar Soleymani ^a, Mohammad Hasanzadeh ^b, Mohammad Hossein Somi ^a, Nasrin Shadjou ^c, Abolghasem Jouyban ^{d,*}

^aLiver and Gastrointestinal Diseases Research Center, Tabriz University of Medical Sciences, Tabriz, Iran.

^bDrug Applied Research Center, Tabriz University of Medical Sciences, Tabriz, Iran.

^cDepartment of Nanochemistry, Nano Technology Center, and Faculty of Chemistry, Urmia University, Urmia, Iran.

^dPharmaceutical Analysis Research Center and Faculty of Pharmacy, Tabriz University of Medical Sciences, Tabriz, Iran.

*Corresponding author.: Tel: +98 41 33379323, Fax: +98 41 33363231, ajouyban@hotmail.com

Abstract

Folate receptor (FR) is overexpressed in various cancer cells while its expression in normal cells is restricted. The present study provides a new folic acid/folate (FA) functionalized nanomaterials to sense and the differentiation of the cancer cells from normal ones. The reported nanoprobe is based on the mesoporous materials that are functionalized with FA to specify the FR overexpressed cancerous cells. MCF 7 cell lines were used as a model to show the ability of the developed probe for cancer cell detection. The selective binding of FA to FR-positive cells causes the endocytosis of the mesoporous materials into the cells where it can be observed by fluorescence microscopy images. The specific nature of the binding of the FA functionalized mesoporous silica prevents the false detection of normal cells from cancerous cells even in the presence of each other. The cytotoxicity of the n-Pr-NH₂-MCM 41-FA on the MCF 7 cells was investigated using MTT assay. The reported method can detect the MCF 7 cells from 100 to 1000 cells/mL. This method provides a selective and nontoxic approach towards detection of

Download English Version:

<https://daneshyari.com/en/article/7229155>

Download Persian Version:

<https://daneshyari.com/article/7229155>

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