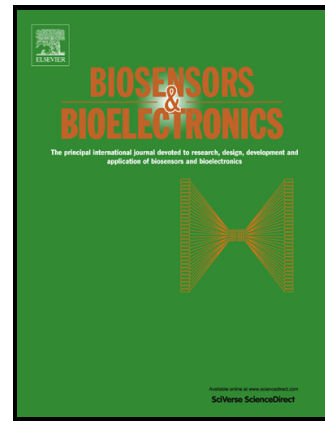


## Author's Accepted Manuscript

Monitoring the spreading stage of lung cells by silicon nanaowire electrical cell impedance sensor for Cancer detection purposes

Hamed Abiri, Mohammad Abdolahad, Milad Gharooni, Seyed Ali Hosseini, Mohsen Janmaleki, Soheil Azimi, Mohammad Hosseini, Shams Mohajerzadeh



PII: S0956-5663(15)00074-3  
DOI: <http://dx.doi.org/10.1016/j.bios.2015.01.057>  
Reference: BIOS7432

To appear in: *Biosensors and Bioelectronic*

Received date: 24 October 2014  
Revised date: 8 January 2015  
Accepted date: 23 January 2015

Cite this article as: Hamed Abiri, Mohammad Abdolahad, Milad Gharooni, Seyed Ali Hosseini, Mohsen Janmaleki, Soheil Azimi, Mohammad Hosseini and Shams Mohajerzadeh, Monitoring the spreading stage of lung cells by silicon nanaowire electrical cell impedance sensor for Cancer detection purposes, *Biosensors and Bioelectronic*, <http://dx.doi.org/10.1016/j.bios.2015.01.057>

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.

## Monitoring the spreading stage of lung cells by Silicon nanowire electrical cell impedance sensor for cancer detection purposes

Hamed Abiri<sup>a,b,#</sup>, Mohammad Abdolahad<sup>a,b,\*,#</sup>, Milad Gharooni<sup>a,b,#</sup>, Seyed Ali Hosseini<sup>a,b,#</sup>, Mohsen Janmaleki<sup>c,#</sup>, Soheil Azimi<sup>a,b</sup>, Mohammad Hosseini<sup>a,b</sup>, Shams Mohajerzadeh<sup>a,b\*</sup>

<sup>a</sup> Nano Electronic Center of Excellence, Thin Film and Nanoelectronic Lab, School of Electrical and Computer Eng, University of Tehran, Tehran, Iran, P.O. Box 14395/515, Tehran, Iran

<sup>b</sup> Nano Electronic Center of Excellence, Nano Bio Electronic Devices Lab, School of Electrical and Computer Eng, University of Tehran, Tehran, Iran, P.O. Box 14395/515, Tehran, Iran

<sup>c</sup> Medical Nanotechnology and Tissue Engineering Research Center, Shahid-Beheshti University of Medical Science P.O. Box 1985717443 Tehran, Iran

\*Email : m.abdolahad@ut.ac.ir, mohajer@ut.ac.ir

# Authors with same collaboration

### Abstract

We developed a silicon nanowire based electrical cell impedance sensor (SiNW-ECIS) as an instrument that detects cancerous cultured living lung cells by monitoring their spreading state at which the cells stretched and become extended on nanowires. Further current penetration into the extended membrane of malignant cells in respect to normal ones (In the first 6h after cells interaction with surface) are the key mechanism in our diagnosis procedure. The developed device applied to monitor the spreading-induced electrical differences between cancerous and normal lung cells in an integral fashion. Detection was performed so faster than the time required to complete cells mitosis. Morphology and architecture of doped Si nanowires covered microelectrodes observably enhance the contact area between cells and electrodes which support accurate signal recording from stretched cells as indicated by SEM and florescent images.

Download English Version:

<https://daneshyari.com/en/article/7232680>

Download Persian Version:

<https://daneshyari.com/article/7232680>

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