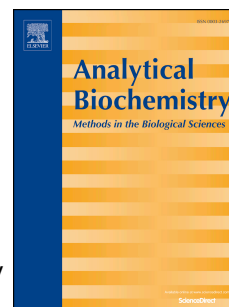


Accepted Manuscript

Analysis of the microbial cell-Ab binding in buffer solution by the piezoelectric resonator

O.I. Guliy, B.D. Zaitsev, I.A. Borodina, G.L. Burygin, O.A. Karavaeva, A.P. Semyonov



PII: S0003-2697(18)30539-6

DOI: [10.1016/j.ab.2018.05.028](https://doi.org/10.1016/j.ab.2018.05.028)

Reference: YABIO 13034

To appear in: *Analytical Biochemistry*

Received Date: 22 May 2018

Accepted Date: 30 May 2018

Please cite this article as: O.I. Guliy, B.D. Zaitsev, I.A. Borodina, G.L. Burygin, O.A. Karavaeva, A.P. Semyonov, Analysis of the microbial cell-Ab binding in buffer solution by the piezoelectric resonator, *Analytical Biochemistry* (2018), doi: 10.1016/j.ab.2018.05.028.

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.

Analysis of the microbial cell-Ab binding in buffer solution by the piezoelectric resonator

Guliy O.I.^{1,2}, Zaitsev B.D.³, Borodina I.A.³, Burygin G.L.^{1,2}

Karavaeva O.A.¹, Semyonov A.P.³

1 – Institute of Biochemistry and Physiology of Plants and Microorganisms, RAS, 13 Prospect Entuziastov, Saratov 410049, Russia

2 – Saratov State Vavilov Agrarian University, Saratov 410012, Russia

3 – Kotel'nikov Institute of Radio Engineering and Electronics of RAS, Saratov Branch, Saratov 410019, Russia

The possibility of the registration of the interaction of the cells *A. lipoferum* Sp59b with the specific antibodies directly in the conducting suspensions by using an acoustic sensor was shown. The main element of the sensor is a piezoelectric resonator with a lateral electric field. The analysis is based on a comparison of the resonator's electrical impedance before and after the specific biological interaction between the cells and antibodies. By using this sensor one can detect and identify the bacterial cells directly in the buffer solution with the conductivity between 2.4 and 20 $\mu\text{S}/\text{cm}$. The minimum detectable concentration of the bacterial cells turned out to be $\sim 10^3$ cells/ml and for a short time (less than 10 min). Also the possibility of the detection of the cells in the presence of the extraneous microflora was shown. The results provide the opportunities for the development of a new class of the methods for the analysis of the microbial cells in *real-time* directly in the buffer solution.

Keywords: microbial cells; antibodies; piezoelectric resonator with a lateral electric field; electrical impedance, buffer solution; conducting suspension; bacterial cells detection.

Download English Version:

<https://daneshyari.com/en/article/7556699>

Download Persian Version:

<https://daneshyari.com/article/7556699>

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