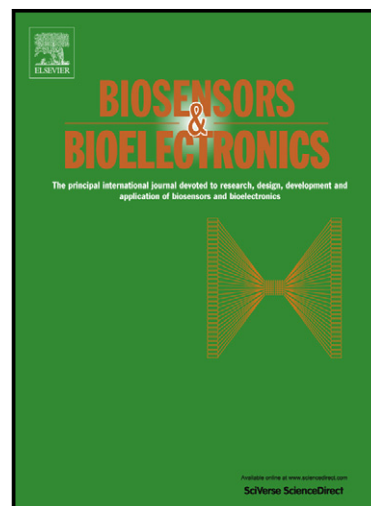


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www.elsevier.com/locate/bios

PII: S0956-5663(13)00824-5
DOI: <http://dx.doi.org/10.1016/j.bios.2013.11.038>
Reference: BIOS6374

To appear in: *Biosensors and Bioelectronics*

Received date: 26 August 2013
Revised date: 4 November 2013
Accepted date: 11 November 2013

Cite this article as: Kenneth B. Walsh, Nicholas DeRoller, Yihao Zhu, Goutam Koley, Application of Ion-sensitive Field Effect Transistors for Ion Channel Screening, *Biosensors and Bioelectronics*, <http://dx.doi.org/10.1016/j.bios.2013.11.038>

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ABSTRACT

Cell-based screening assays are now widely used for identifying compounds that serve as ion channel modulators. However, instrumentation for the automated, real-time analysis of ion flux from clonal and primary cells is lacking. This study describes the initial development of an ion-sensitive field effect transistor (ISFET)-based screening assay for the acquisition of K⁺ efflux data from cells cultured in multi-well plates. Silicon-based K⁺-sensitive ISFETs were tested for their electrical response to varying concentrations of KCl and found to display a linear response relationship to KCl in the range of 10 μ M to 1 mM. The ISFETs, along with reference electrodes, were inserted into fast-flow chambers containing either human colonic T84 epithelial cells or U251-MG glioma cells. Application

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