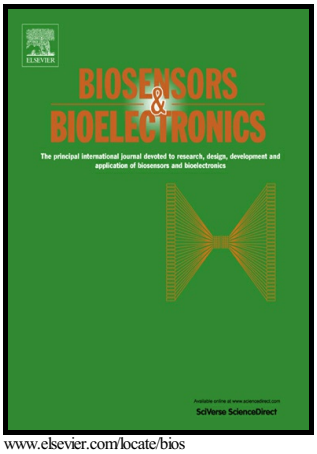


www.elsevier.com/locate/bios

# Bioelectronic nose: current status and perspectives

Tomasz Wasilewski, Jacek Gębicki, Wojciech Kamysz

PII: S0956-5663(16)30837-5
DOI: http://dx.doi.org/10.1016/j.bios.2016.08.080
Reference: BIOS9077

To appear in: *Biosensors and Bioelectronic*

Received date: 30 June 2016
Revised date: 23 August 2016
Accepted date: 24 August 2016

Cite this article as: Tomasz Wasilewski, Jacek Gębicki and Wojciech Kamysz, Bioelectronic nose: current status and perspectives, *Biosensors an Bioelectronic,* http://dx.doi.org/10.1016/j.bios.2016.08.080

# Bioelectronic nose: current status and perspectives

Tomasz Wasilewski[1*], Jacek Gębicki[2], Wojciech Kamysz[1]

[1]Medical University of Gdansk, Department of Inorganic Chemistry, Faculty of Pharmacy, Medical University of Gdansk, Poland, Al. Hallera 107, 80-416 Gdansk, Poland

[2]Gdańsk University of Technology, Department of Chemical and Process Engineering, Chemical Faculty, Gdańsk University of Technology, Gabriela Narutowicza 11/12 Str., 80-233 Gdańsk, Poland

*e-mail: tomwasil@gumed.edu.pl



**Abstract**

A characteristic feature of human and animal organs of smell is the ability to identify hundreds of thousands of odours. It is accompanied by particular smell sensations, which are a basic source of information about odour mixture. The main structural elements of biological smell systems are the olfactory receptors. Small differences in a structure of odorous molecules (odorants) can lead to significant change of odour, which is due to the fact that each of the olfactory receptors is coded with different gene and usually corresponds to different type of odour. Discovery and characterization of the gene family coding the olfactory receptors contributed to the elaboration and development of the electronic smell systems, the so-called bioelectronic noses. The olfactory receptors are employed as a biological element in this type of instruments. An electronic system includes a converter part, which allows measurement and processing of generated signals. A suitable data analysis system is also required to visualize the results. Application potentialities of the bioelectronic noses are focused on the fields of economy and science where highly selective and sensitive analysis of odorous substances is required. The paper presents a review of the latest achievements and critical evaluation of the state of art in the field of bioelectronic noses.