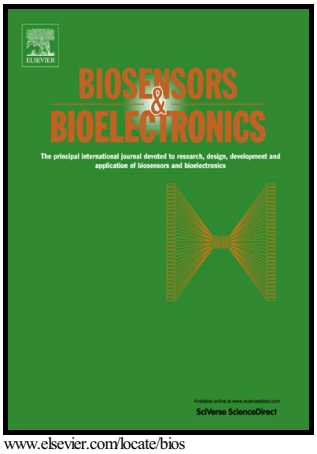

www.elsevier.com/locate/bios

Bioelectronic tongues: new trends and applications in water and food analysis

Xavier Cetó, Nicolas H. Voelcker, Beatriz Prieto-Simón

PII: S0956-5663(15)30727-2
DOI: http://dx.doi.org/10.1016/j.bios.2015.12.075
Reference: BIOS8305

To appear in: *Biosensors and Bioelectronic*

Received date: 10 October 2015
Revised date: 11 December 2015
Accepted date: 21 December 2015

Cite this article as: Xavier Cetó, Nicolas H. Voelcker and Beatriz Prieto-Simón Bioelectronic tongues: new trends and applications in water and food analysis *Biosensors and Bioelectronic,* http://dx.doi.org/10.1016/j.bios.2015.12.075

Bioelectronic tongues: new trends and applications in water and food analysis

Xavier Cetó, Nicolas H. Voelcker and Beatriz Prieto-Simón*

ARC Centre of Excellence in Convergent Bio-Nano Science and Technology, Future Industries Institute, University of South Australia, SA 5095, Australia

Abstract

Over the last years, there has been an increasing demand for fast, highly sensitive and selective methods of analysis to meet new challenges in environmental monitoring, food safety and public health. In response to this demand, biosensors have arisen as a promising tool, which offers accurate chemical data in a timely and cost-effective manner. However, the difficulty to obtain sensors with appropriate selectivity and sensitivity for a given analyte and to solve analytical problems which do not require the quantification of a certain analyte, but an overall effect on a biological system (e.g. toxicity, quality indices, provenance, freshness, etc.), led to the concept of electronic tongues as a new strategy to tackle these problems.

In this direction, to improve the performance of electronic tongues, and thus to spawn new application fields, biosensors have recently been incorporated to electronic tongue arrays, leading to what is known as bioelectronic tongues. Bioelectronic tongues provide superior performance by combining the capabilities of electronic tongues to derive meaning from complex or imprecise data, and the high selectivity and specificity of biosensors. The result is postulated as a tool that exploits chemometrics to solve biosensors' interference problems, and biosensors to solve electronic tongues' selectivity problems.

The review presented herein aims to illustrate the capabilities of bioelectronic tongues as analytical tools, especially suited for screening analysis, with particular emphasis in water analysis and the characterization of food and beverages. After briefly reviewing the key concepts related to the design and principles of electronic tongues, we provide

* E-mail: beatriz.prietosimon@unisa.edu.au