DOI: http://doi.org/10.21698/simi.2019.ab36

WHAT IS THE BIOSENSOR IMPACT IN THE ENVIRONMENTAL MONITORING?

Jean Louis Marty

Université de Perpignan Via Domitia, 52 Avenue Paul Alduy, 66860 Perpignan Cedex, phone: +33 616814591, e-mail: jlmarty@univ-perp.fr, France

Keywords*: array sensor, biosensor, BOD_5, neurotoxicity*

Toxic substances menacing to the humans, agriculture, livestock and wildlife may contaminate the aquatic resources and portable water system such as heavy metals, toxins, and environmental pollutants. In the last decades, the liberation of industrial effluents containing new xenobiotic compounds such as pharmaceuticals, endocrine disruptors, surfactants, and industrial additives to water resources has became a serious concern. The worldwide different regulatory authorities has set the regulatory standards for these contaminants but the permissible limits are in very low concentration i.e. pg/L or ng/kg. In consideration of toxicity and ubiquity of these compounds, the development of fast, sensitive and reliable detection methods are of immense need. Some conventional analytical methods are commonly used for the control of the environment. These methods possess low detection ranges, the disadvantages such as lack of on site performance, high cost and requirement of highly trained professionals limit their applications and are therefore difficult to establish specially in the developing countries. To overcome the above limitation, the traditional and novel screening methods have found a wide application in screening of water quality.

The current tendency has driven the development of biosensors as new analytical tools able to provide fast, reliable, and sensitive measurements with low cost; many of them aimed for on-site analysis. Biosensors may not completely replace the official analytical methods, but can be used both by regulatory authorities and by industry to add up the information for routine testing and screening of samples. Biosensors are defined as analytical devices incorporating a biological material, or biomimic, intimately associated with or integrated within a physicochemical transducer or transducing microsystem. The main advantages of biosensors are short times of analysis, low cost of assays, portable equipment, real-time measurements, and suitability as remote devices. These new technologies have been applied in quantitative analysis of various target analytes.

The present state of art suggests the evidence of several screening and biosensing methods for detection of these xeno-compounds. Currently, we will present and discuss some results obtained in our group with their advantages and drawbacks. Hereby, we conclude that in future the monitoring of contaminants will be based on bio sensing methods, measuring the global effect of various pollutants or the use of multiple array biosensors combined equipped with software.