

Fabrication of novel sensor platforms for detection of biologically relevant species

Mauro Bertotti

Department of Fundamental Chemistry, Institute of Chemistry, University of São Paulo

Av. Prof. Lineu Prestes, 748, São Paulo, SP, Brasil

Abstract: Miniaturized electrochemical sensors are a suitable tool to get information on chemical events that take place in individual tissues and cells. With such devices, measurements can be performed at very short time scales and with minor perturbation of the investigated system. Examples include the transport of molecules through the surface of individual cells and the real time monitoring of neurotransmitters, hence the correlation between behavior and molecular events can be better established. By employing devices with such features, interdisciplinary collaborations that lead to a broader understanding of different chemical aspects related to biological phenomena can be implemented. Accordingly, this lecture will focus on the development of new platforms for in situ detection of biologically relevant compounds at real time. The benefits of the functionalization of the electrode surface towards more selective and sensitive measurements will be illustrated with a few examples. Further advantages of using miniaturized probes include the possibility of positioning the sensor tip at or in close proximity to an examined sample by using Scanning Electrochemical Microscopy (SECM). This technique has been increasingly applied in the analysis of biological samples (living cells and immobilized biomacromolecules) to study and visualize cellular activities with high spatial and temporal resolution and some examples will be also presented.

Acknowledgements: CNPq, FAPESP and CAPES

* e-mail: mbertott@iq.usp.br