



CONFERENCE

“Bioelectronic sensors using networks of communicating cells for label free drug screening platforms”

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About the talk:

The existence of *in vitro* devices capable to measure how a network of communicating cells reacts in response to pharmaceuticals is technologically relevant. In comparison with *in vivo* assays, extracellular based devices are simpler, cheaper and high-throughput systems.

Recently, our research team (currently 3 PhD students) has developed bioelectronic devices that can measure the long-range communication of non-excitabile cells. Examples of non-excitabile cells are for instance cancer and skin cells. Unlike neurons, non-excitabile cells do not generate action potentials, instead, generate synchronized oscillations resembling to chemical waves that travel long distances through the cell network. Cells use these traveling oscillations to regulate a number of cell functions, including migration, proliferation and differentiation. Using organic based materials our research team succeeded monitoring of cell activity, which is carried out in real time, over periods as long as months and in a non-invasive way. We use these devices to monitor how cancer cells (gliomas) establish cell-cell connections and how they react when exposed to drugs. In this contribution the application of these novel bioelectronic devices in discovering and assessing therapeutic effects of substances is presented and discussed.

Short biography:

Henrique Leonel Gomes is Associate Professor in the Department of Electronics and Informatics, at the University of the Algarve, Faro, Portugal. He heads the organic electronics research group and he is the director of the doctoral plan of studies in electronics and telecommunication. His research interests have been directed towards the electrical characterization of electronic devices such as field effect transistors, diodes and capacitor structures. He has a recognized experience in small signal impedance measurement techniques. Since 2000, his research activities have expanded to encompass the interaction between electronic devices and living cells to develop biosensors and biomedical devices. Henrique Gomes established at the University of the Algarve a renowned infrastructure that provides a broad range of electrical measuring techniques to evaluate device performance, electrical stability, electrical noise and device reliability.

In collaboration with USMBA in the name of Pr. Badiia Lyoussi, an impedance based electronic tongue has been developed and applied to honey botanical origin determination using Zantaz honey, a territory honey produced in Atlas region, and lavender honey produced in Portugal. The contribution was published in high impact journal and initiated an ongoing collaboration between both institutions.

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