PARTNER PRESENTATION AND INTEREST IN HORIZON EUROPE PARTICIPATION

A non-invasive reusable saliva glucose amperometric sensor with capabilities towards wearable devices

Short Description

A robust and reusable amperometric sensor for the continuous and sensitive detection of glucose for in vitro samples of human saliva has been developed using a POC system. The amperometric sensors can detect glucose in saliva samples with high accuracy comparative with samples tested with the ELISA commercials kits. Moreover, they have the capability to be reused after a simple drying process and can be used for continuous salivary glucose monitoring. The proposed sensor assures the continuous measurement of glucose in a range of 0 to 33000 µM and is compatible with commercially available miniaturized potentiostats for point-of-care in vitro detection. Our studies also bring new contributions regarding the correlation between glucose in human saliva samples and human blood samples.

Similar sensors do not exist on the medical market so a big challenge is going to be the fabrication of the device and acquiring the necessary samples for its complete testing on biological probes from patients (saliva) versus blood tests (”golden standard”)

Technical goals

- Development and optimization of the technology process for the fabrication of the proposed chips.
- Development of a reusable, biocompatible, stable and sensitive glucose layer for a wide range of glucose concentrations in saliva samples from low saliva concentrations <10 µM/L to high concentrations up to 30 mM/L.
- Optimization of the technology for a reproducible sensitive layer using a controllable process for its fabrication: electrochemical deposition and drop casting deposition.

Organization

The National Institute for Research and Development in Microtechnologies (IMT Bucharest) is a public non-budgetary institute established in 1996. Its activity covers research and development in the field of micro- and nano- technology, nanomaterial characterisation and technology transfer, with sensors being developed for use in medical diagnostics, pharmaceuticals, in vitro and in-vivo measurements.

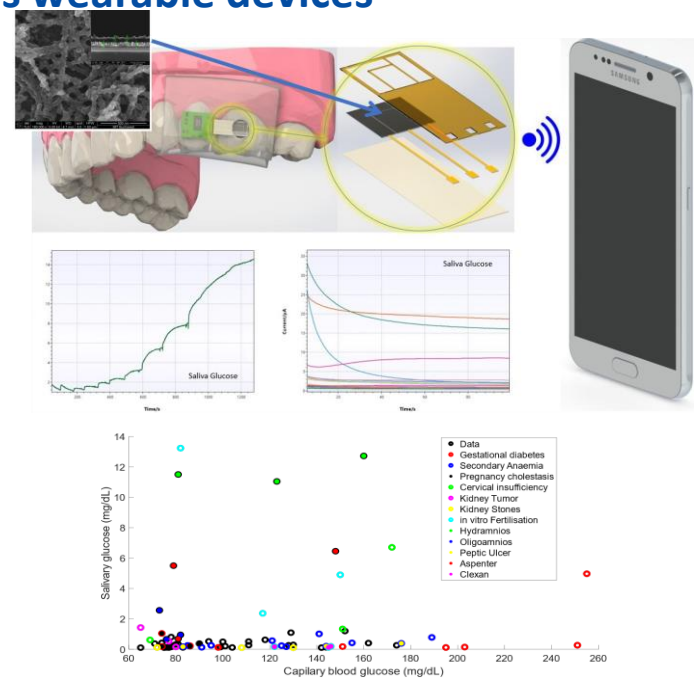

Fig.1: Representation of the measured datapoints as a function of the capillary blood and salivary glucose. Colours were employed to mark the datapoints collected following a specific treatment in addition to testing the intolerance for glucose or from patients affected by specific conditions such as diabetes or anaemia.

Fig.2 Chips are developed via lithography on a ceramic substrate

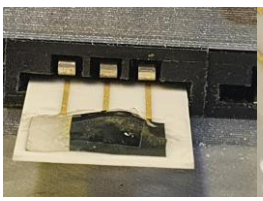

Fig.3. Enzymatic layer after reaction with glucose

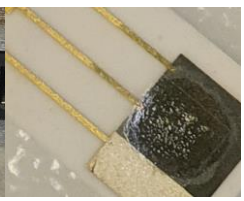

Fig.4. Sensitive and biocompatible layer after drying process

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