

Point-of-care analytical device for rapid and multiplexed detection of biomarkers

CSIC at the Instituto de Microelectrónica de Barcelona – Cento Nacional de Microelectrónica has developed a compact analytical device for rapid and multiplexed detection of multipurposed biomarkers present in biological fluids. The design of the analytical device simplifies scalability of an array of electrochemical cells, making it suitable for point-of-care analytical approaches.

Industrial partners from the biomedical industry are being sought to collaborate through a patent licence agreement.

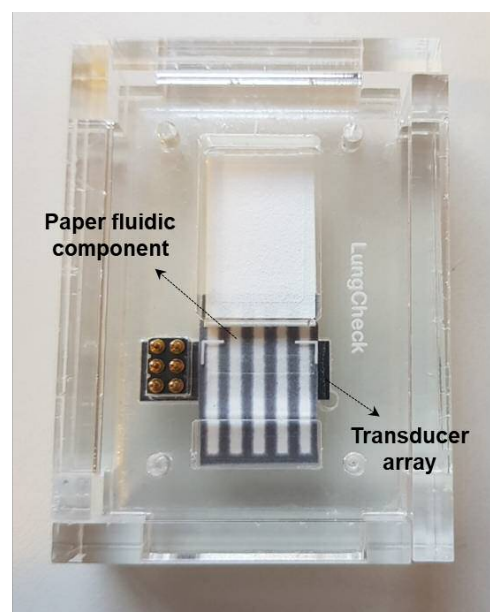
An offer for Patent Licensing

Small multiplexed system that produces less material waste per analysis

By combining a reusable electrochemical transducer array and a disposable paper fluidic component easily aligned against each other in a plastic cartridge that enables the replacement of the paper component after one measurement.

The electrochemical transducer array comprises two-electrode electrochemical cell arrays sharing a common electrode connection that was designed to minimize the number of electrical tracks required for connecting all the electrodes and thus reduce its overall size and thus overcomes one of the main shortcomings of previous electrochemical cell array architectures.

The overall configuration also includes the use of magnetic nanoparticles for sample pretreatment for simple and rapid biomarker analysis, allowing to carry out multi-parametric and/or multisample analysis.



Picture of the multiplexed device prototype

Main innovations and advantages

The main advantages of the prototype developed are the following:

- Multiplexed and simultaneous detection of biomarkers in blood, serum, urine, saliva, sputum, nasopharyngeal and oropharyngeal specimens, i.e. bacteria and virus proteins like the ones produced by SARS-Cov-2 infection, RNA, IgM and IgG antibodies and cytokines (IL-6, IL-8).
- Low-cost technology. The reduced device size and the combination of a reusable electrochemical cell array and a disposable fluidic component make the cost per analysis to be greatly reduced as well as the material waste minimized.
- Compact and simple array of electrochemical transducers whose number could be easily enlarged for highly multiplexed detection without compromising assay performance. This is suitable for ELISA-like assay approaches and multiplexed point-of-care devices.

Patent Status

Priority patent application filed suitable for international extension

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