

Press release

New technology that opens the door to personalised therapies designed to treat cancer

- ▶▶ *IK4-TEKNIKER is conducting research into the electrochemical detection of biomarkers linked to cancer and inflammatory diseases in human serum*
- ▶▶ *The technology, which is in the automation phase, will allow the cells that express these markers to be immobilised, and the over-expression of markers in the cell membrane itself to be detected; it is an achievement that opens up the door to the future development of personalised therapies*
- ▶▶ *The main conclusions drawn in this research so far have been published in Biosensors & Bioelectronics, the scientific journal with a high impact index*

(Eibar, Gipuzkoa, Basque Country. 29 June, 2015).- In order to improve the diagnosis of diseases, IK4-TEKNIKER has furthered research into a new piece of technology for the electrochemical detection of biomarkers relating to cancer and inflammatory disorders. It not only identifies the cells that display an over-expression of proteins linked to these disorders, it allows over-expressed proteins in the cell membrane to be immobilised and detected; this is an achievement that opens up the door to creating treatments adapted to the needs of each individual patient.

For the last two years the R&D centre has been working on the design of this technology, which allows the cells that overexpress the ErbB2 protein in breast cancer cell lines to be identified; this is a key biomarker for the prognosis and subsequent treatment of breast cancer, the most frequent cancer in women and which accounts for 23% of the total number of cases.

IK4-TEKNIKER experts have developed a biosensor based on the use of magnetic particles for detecting ErbB2 in three different mediums: circulating in the serum, in cell lysates and directly on the cell surface.

In the third case there has been success in discriminating the cancer cells in breast cancer that overexpress this protein and in capturing them using magnetic particles with specific antibodies to quantify them with amperometric measurements.

The technology makes it possible to assess the patient's status not only in serum samples but also in tumour tissue by means of a technique that is extremely sensitive but low-cost at the same time; it is also a technique that can be easily automated by means of specific protocols for preparing the sample by means of microfluidics.

“We have managed to detect and immobilise whole cells that express this protein in an abnormal way. This is important because it opens up the door to developing personalised therapies”, said Santos Merino, the researcher responsible for IK4-TEKNIKER's Micro and Nanomanufacturing Unit.

The ultimate aim of the study is to come up with a robust, dependable, fast, cost-effective measuring technology which will also enable various parameters to be measured together; that will provide information allowing a more precise diagnosis to be made.

The key development elements they are working on are based on the technology allowing various markers to be rapidly detected at the same time using a small serum sample in a short period of time; this is also automated to cut human action to a minimum during the process.

According to the research team, it is technology that can be extended to other fields, such as the analysis of free DNA circulating in blood samples, a highly promising means for disease diagnosis that could replace tissue biopsies.

The technology is in the automation phase and the researchers are hoping to use it to measure up to four different biomarkers together.

The main conclusions drawn in this research so far have been published in *Biosensors & Bioelectronics*, the scientific journal with a high impact index (6.45).

About IK4-TEKNIKER

With experience spanning over 30 years in research into applied technology and its transfer to companies, IK4-TEKNIKER has achieved a high degree of expertise in four major areas (Advanced Manufacturing, Surface Engineering, Product Engineering and ICTs), which enables it to put its state-of-the-art technology at the service of any kind of task.

Further information

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