Fast and selective system for the analysis of protein isoforms: a powerful biomarker for cancer and cardiovascular diseases

CSIC has devised a fast, selective capillary electrophoresis system to analyse alpha-1 acid glycoprotein (AGP or orosomucoid) isoforms. AGP purification is done in the capillary by an immunoabsorbent phase and isoforms are electrophoretically separated. The method may be useful to diagnose cancer, inflammatory or cardiovascular diseases, associated to specific AGP isoforms proportions. We look for a company interested in further development and a patent licence.

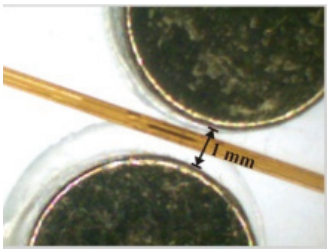
An offer for Patent Licensing and/or R+D collaboration

Description of the offer

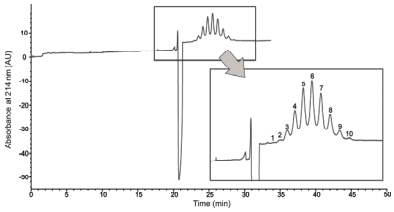
The development of fast, selective, and sensitive methods for analysis of proteins in different samples has great importance in the field of diagnosis and prognosis of several diseases and other clinical conditions. Glycoproteins, for example, present several isoforms due to variations in their polypeptidic and/or glycosidic moieties. In the case of α–1 acid glycoprotein (AGP), differences in the proportion of isoforms in biological fluids (plasma, serum, urine) between healthy and diseased individuals have been related to different pathological situations such as cancer or cardiovascular diseases, among others.

One of the most useful methods for the separation and analysis of isoforms from intact glycoproteins is capillary electrophoresis. The main problem of this method is the need to isolate the glycoprotein of interest from the biological sample, through cumbersome and time consuming processes, before performing the electrophoretic analysis.

In this offer a new method, based on immunoaffinity capillary electrophoresis has been developed for the analysis of glycoprotein isoforms. The method uses an immunoadsorbent phase (anti-AGP antibodies), magnetically fixed inside the capillary, which allows the purification and preconcentration of the glycoprotein inside the same column in which electrophoretical separation of isoforms is performed. The procedure allows separation of AGP isoforms from human fluid samples in a short time with minimal sample manipulation.



Sample preconcentration is done inside the capillary using anti-AGP antibodies magnetically fixed inside the capillary



Analysis of AGP isoforms from a serum sample from a healthy donor

Innovative aspects and advantages

- Purification, preconcentration, separation and detection of AGP isoforms from serum samples is done in 1 hour (which compares favorably with the 4 days required in traditional sample preparation methods and with the 4 hours needed in off-line immunopurification plus capillary electrophoresis procedures) minimizing sample and reagents consumption and simplifying the process
- The method can be carried out in standard capillary electrophoresis apparatus using a device that is easily coupled to the capillary
- The analysis can be carried out several times in a continuous way without cross-contamination or loss in precision. The method could be easily automated
- AGP isoforms are separated with good resolution and the comparison between profiles of different samples could be used as a biomarker of different diseases

Patent Status

Priority patent application filed

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