



PEPS



Fast biological assessment with microfluidic device and proteomics

What is PEPS?

Biomarkers are key to detect and monitor pathologies, and evaluate treatment efficiency. Currently, blood samples taken for tests such as proteomic analyses using mass spectrometry must be prepared manually. To save time and avoid human errors, CEA-Leti, in partnership with Clinec and CEA-Irig, has designed PEPS, a miniaturized and transportable microfluidic laboratory which automatically performs all the steps necessary for the preparation of all types of markers: from plasma extraction to peptide purification. Blood is a sensitive material that requires delicate handling in proteomics.

PEPS device operates a microfluidic cartridge to provide fully automated fluid processing and thermal control of blood sample. In less than 2 hours (vs. 24hrs manually),

PEPS performs all complex preparation steps for proteomics analysis. It includes whole blood collection at bedside, plasma separation and metering, depletion of abundant proteins, protein digestion with trypsin and stabilization of peptides on solid phase extraction sorbent.

Applications

PEPS enables large scale clinical testing using MS-based proteomics, and in the future, the discovery of new biomarkers.

What's new?

PEPS is a highly reliable and robust microfluidic device that rapidly processes whole blood samples at the patient's bedside, enabling point-of-need and standardized MS-based proteomics analyses.

PEPS features:

- A reusable electro mechanical device that controls precisely all preparation parameters (pressure, volumes, temperature, etc.)
- A disposable microfluidic cartridge specially designed with embedded lyophilized reagents, valves and filters, as well as integrated chromatographic column
- 14+ sample preparation steps integrated in one single cartridge
- Process fully automated
- Performing all complex stages: safe blood collection, easy filtration, fast mixing, accurate dilution, precise temperature control
- Completion time reduced to 2 hrs vs. 24 hrs when done manually

First fully integrated platform designed for end-to-end processing of biological samples, from matrix collection to MS analysis.

What's next?

This technology is under evaluation for different application by industrial partners.

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Key facts

- Publication: "PEPS: an innovative microfluidic device for bedside whole blood processing before plasma proteomics analyses" *Anal. Chem.* 2021, 93,2, 683-690
- Conference poster: SMAP 2019, Lab-On-Chip 2019 and μ TAS 2019
- Conference: μ TAS 2021



Interested in this technology?

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