

MONOCHANNEL MICROFLUIDIC DEVICE FOR MULTIPLE DETECTION

An innovative microfluidic device that enables the quantitative analysis of multiple targets within a single channel.

Context

Current microfluidic systems reduce the volume of consumables, waste and samples to be analyzed. In addition, these systems are well adapted to the detection and/or quantification of one biological or chemical species (target) in a sample. There is, however, an unmet need for a microfluidic device that can detect and quantify several targets in one step, and that is easy and cheap to manufacture.

Invention description

The present invention consists in a microfluidic device that allows the quantitative detection of several targets in a liquid sample, even at trace level.

More specifically, the microfluidic device is composed of a microchannel, the surface of which includes distinct areas each grafted with a ligand. Each ligand binds to a different target, so that when a sample is circulated in the microchannel, the different targets present inside the sample are simultaneously extracted and concentrated on the different grafted areas. A microfluidic detection system can then detect and quantify the targets bound to the ligands.

The invention also provides a method for manufacturing the microfluidic device and a method for analyzing a sample containing targets using the microchannel device and the microfluidic detection system.

Added value

The microfluidic device and detection system enable the extraction, concentration, and quantification of different targets contained in a sample, in a single step. This invention is particularly appropriate for the analysis of complex samples with small quantities of targets (including trace levels), or dangerous samples *e.g.* containing radioactive elements, and/or samples that are not available in large quantities *e.g.* biological or environmental samples.

Potential market

This invention is relevant for the analysis and the quantitative characterization of targets in samples from a range of fields such as diagnostics, analysis of biological systems, healthcare (*e.g.* analysis of pharmaceutical compounds and their metabolites), environmental monitoring (*e.g.* monitoring pollutants), agriculture, cosmetics, security & defense, or quality control.

Intellectual property

Patents

WO2016059080 (lapsed)

EP3206792 (pending)

US2017246631 (pending)

Keywords

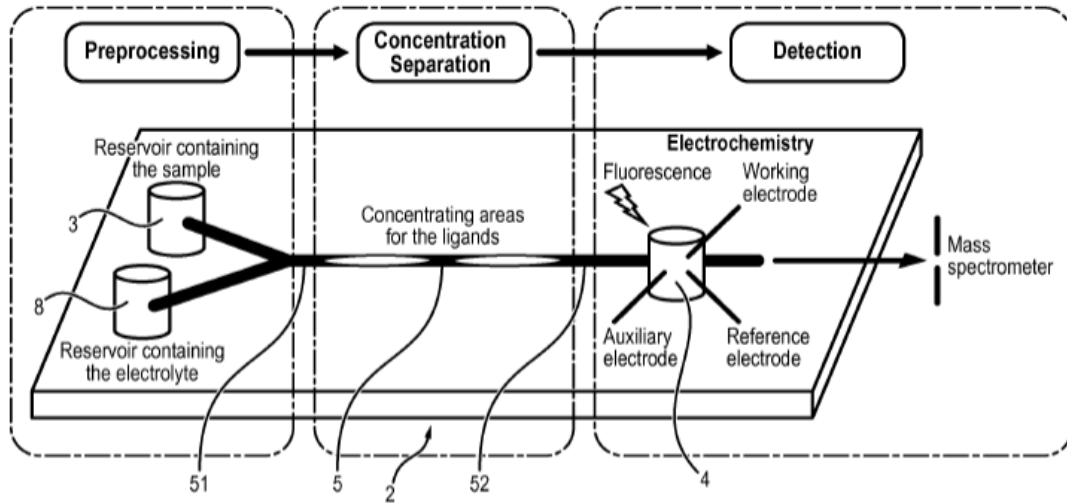
Microfluidic; Microchannel; Ligand; Quantitative detection of biological or chemical species

Technology domain

Analysis of biological materials; Chemical engineering

Technology transfer contact

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Microfluidic detection system