

## Innovative Extraction Technology for MS Analytics



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The developed disposable device features an innovative extraction technology that allows to extract and separate analytes (small molecules) from biological matrices and considerably expands the spectrum of easily automatable applications. The technology is particularly relevant for LC-MS applications in the areas of toxicology, forensics, therapeutic drug monitoring, pain management as well as clinical research and diagnostics since it addresses two-thirds of the active substances which are most often utilised in these areas.

### Goals of the project and challenges

A large proportion of all applications in the field of clinical diagnostics and biopharmaceutics is based on processes involving the extraction of target analytes from complex samples. Quantitative analysis by LC-coupled mass spectrometry thereby makes it possible to sensitively and selectively detect an array of analytes from small sample amounts. Sample throughput has continued to increase over the past few years and new demands are being made on the preparation of samples. The main challenges involved with this project are the demonstration and improvement of reproducibility and robustness, the traceability of the samples, and the reduction of costs. Automated sample preparation could bring considerable advantages provided that this automation is easy to use and, on the whole, is economical.

### Project results

In the CTI project with TECAN Schweiz AG, an easily automatable disposable (in 96 well format) was developed, which comprises an innovative



Commercially available TECAN® AC Extraction Plate™ for the extraction of apolar analytes using the «Pipette & Shake» workflow (Tecan product number 30072211: [www.tecan.com/acplate](http://www.tecan.com/acplate))

approach for the extraction of charged analytes by ion exchange functionality. The advantages of this device can be summarised as follows:

- realisation of a simple pipette-and-shake-workflow, which allows implementation without centrifugation or vacuum, reductions in both time and cost and an increase in pipetting accuracy;
- comparable ion exchange capacity per extraction unit (well/channel) to flow based products (e. g. Solid Phase Extraction SPE), thus an inexpensive and robust automation solution is possible without disadvantages;
- good reproducibility of extraction performance which offers higher process security;

- ensuring improved transfer to automated procedures and thus increased throughput and a reduction of error rate;
- enablement of simple production process and quality control procedures which ensure a reduction in costs and allow high process fidelity.

The result of the project is an innovative technology which demonstrates reproducible extraction of analytes by pipette-and-shake-workflow for charged and therefore polar analytes through ion exchange functionality. Significant benefit for test laboratories and patients is anticipated.

### Research project

#### Innovative extraction technology for automated sample preparation for mass spectrometry applications in the integrated laboratory

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