MICROFLUIDIC CHIP FOR THE ANALYSIS OF VERSATILE BIOCHEMICAL REACTIONS

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The driving force for the successful miniaturization of microfluidic systems in biotechnology and bioanalysis is not only the reduction of sample volumes down to nano- and picoliter sizes but also leads to remarkably improved performance, such as higher separation efficiency, shorter analyzing times, and enhanced detection sensitivities. Integrated microfluidic devices containing pumps, valves, separation systems, and detectors follow the concept of the so-called total (bio-chemical) analysis systems, TAS. Ideally, each step of the analysis is realized on an integrated device. The steps include sample injection, transportation, mixing, (bio-) chemical reactions, separation, and their analytical identification. Especially, Interfacing microfluidic chips with external analytical instruments has been applied to most lab-on-a-chip application for parallel and multiple analyses since sensitive on-chip detection still remains challenge in analyzing extremely small volume and low concentration [1]. Mass spectrometry (MS) has become one of the most commonly used analysis methods for biomolecules due to its inherent simplicity, low sample consumption and high sensitivity [2].

In this study, we will present this concept as fully integrated biochemical microfludic device, namely lab on a chip, for fluidic handling as well as reaction, separation, and detection.

References

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