

Micro/nanofluidic systems for biotechnology

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The driving force for the successful miniaturization of micro/ nano-fludic 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.

In here, we will present this concept as fully integrated biochemical microfluidic device, namely lab on a chip, for fluidic handling as well as reaction, separation, and detection and nano-fluidic system for efficient biomolecule separation.