

Two innovations in microchip electrophoresis: 1) integrating the internal standard in the background electrolyte; 2) continuous flow DNA separation by field-dependent mobility

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Two recent developments in the field of electrophoretic separation at the BIOS /Lab on a Chip group will be presented.

The first development reports on an improvement of the quantification in point-of-care microchip capillary electrophoresis by integrating the internal standard in the background electrolyte. It was found that the resulting system peaks can be used to improve the standard deviation of the analysis [1].

The second development concerns continuous flow DNA separation by using the field-dependent mobility of DNA in an agarose matrix. By the alternating application of two orthogonal E-fields of strongly different magnitude, DNA molecules of different length could be separated in continuous flow as they have different mobilities in the low field and equal mobilities in the strong field [2].

[1] A.C.E. Bidulock, P. Dubsky, A. van den Berg and J.C.T. Eijkel, Integrating Internal Standards into Disposable Capillary Electrophoresis Devices To Improve Quantification, Anal. Chem. 89 (2017) 2886-2892

[2] B. Gumuscu, J.G. Bomer, H. de Boer, A. van den Berg, and J.C.T. Eijkel, Exploiting biased reptation for continuous flow preparative DNA fractionation in a versatile microfluidic platform, Accepted for publication in Microsystems & Nanoengineering