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Quantitative analysis of clonidine and ephedrine by a microfluidic system: 1
On-chip electromembrane extraction followed by high performance liquid 2
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Highlights 11

- A microfluidic device was developed for on-chip electromembrane extraction. 12
- It was applied for extraction ephedrine and clonidine from urine and plasma samples. 13
- The separation and determination of the analytes were performed by HPLC-UV. 14
- The limits of detection were less than 7.0 and 11 $\mu\text{g L}^{-1}$ in urine and plasma samples. 15
- Smaller distance between electrodes makes it possible to apply low applied voltages. 16

Abbreviations: 21

CLO: clonidine; DEHP: di-(2-ethylhexyl) phosphate; EME: electromembrane extraction; EPH: 22
ephedrine; ER: extraction recovery; CCD: central composite design; HF-LPME: hollow fiber 23
liquid phase microextraction; HPLC: high performance liquid chromatography; LDR: linear 24
dynamic range; LLE: liquid-liquid extraction; LOD: limit of detection; NPOE: 2-nitrophenyl 25
octyl ether; PF: preconcentration factor; PPMA: polymethyl methacrylate; RR: relative 26

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