

### Micro-dialysis of protein from urea-rich sample in microfluidic device

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Microfluidic technology allows the design and operation of effective and simple devices for sample preparation and cleanup. Majority of current sample preparation methods is focused on the complex and combined various steps such as solid phase extraction and membrane dialysis, and what's more, it is still performed off-chip in many cases. As a result, we made the simple and rapid microfluidic desalting system, which were 3-phase flow micro-dialysis using the simple diffusion and 5-phase flow micro-dialysis based on the coupling simple diffusion with affinity of urea, for the effective removal of urea. The facilitative desalting system is particularly useful for removal of urea and for analysis of protein by mass spectroscopy so that it is removed urea by the mass transfer with the different of concentration and molecular size and the affinity of urea with the complex of copper(II) ion and urea. We also evaluated the activity and MALDI-TOF-MS spectrum of red fluorescent protein (RFP) for protein analysis.

This work was supported by grant No.R01-2004-000-10681-0 from the Basic Research Program of the Korea Science & Engineering Foundation.