

## Removal of salt from salt-rich protein sample using electric field in microfluidic device

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It is generally recognized that sample treatment often is the bottleneck for the rapid analysis of protein due to performing off-chip in many cases. In this study, for an effective cleaning of protein from a urea-rich protein sample, electro-microfluidic desalting system was applied using the charge characteristics of protein. The cleanup of protein sample was carried out by the inclining of electric field from the sample phase to the buffer phase near by negative electrode because of positive charged of RFP (red fluorescent protein) in the pH 7.0 buffer solution. However, salts such as urea only was moved to both buffer phase by the difference of concentration because it had no charged characteristic with the change of pH. In this study, we made the simple and rapid electro-microfluidic desalting systems and the removal efficiency of the urea was above 85% with the voltage from 60 mV to 150mV. In addition, the protein after desalting with the electro-microfluidic device was shown a significant improvement signal of MALDI-TOF-MS spectrum of red fluorescent protein (RFP) for protein analysis.