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Electrokinetic trapping of biomolecules in a microdroplet outside micro/nanochannel hybrid system DUSTIN MOON, POSTECH, San 31, Hyojadong, Namgu, Pohang, Korea 790-784, SUNG JAE KIM, MIT, 77 Massachusettes Ave. Cambridge, MA, USA 02139, IN SEOK KANG, POSTECH, San 31, Hyojadong, Namgu, Pohang, Korea 790-784, JONGYOON HAN, MIT, 77 Massachusettes Ave. Cambridge, MA, USA 02139 — We describe a new method of electrokinetic trapping process in a droplet-micro/nanochannel hybrid system based on concentration polarization (CP) phenomena near nanochannels. Two microchannels are connected to the outside of the PDMS chip and micordroplet connects the channels at the outside of the PDMS. A nanojunction connects a third, ground channel and the droplet. With DC bias, CP is initiated and ions start to be depleted at the anodic side, with EOF towards the droplet. With tangential electric field through the droplet, any charged species would form a plug inside the droplet and EOF, depending on the voltage configuration of each anodic side, would define the droplet volume. By having small droplet volume with plug accumulating sample in it, highly concentrated droplet can be formed. Since the droplet is formed outside the channels, these accumulated molecules can be directly dispensed to a sample plate and be detected using conventional immunoassays and other techniques without further diffusion.

Dustin Moon
POSTECH, San 31, Hyojadong, Namgu, Pohang, Korea 790-784

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