

**A novel affinity separation in microfluidic aqueous
two-phase extraction systems using protein
as a ligand carrier**

장우진*, 박혜미, 최주형, 박나미, 구윤모
인하대학교 생명화학공학과
(wjchang@inha.ac.kr*)

Aqueous two-phase systems (ATPS), composed of phase-separating polymers or salts, is well-known technology for the separation of biomolecules because it offers biocompatibility, diversity, ease of scale-up, etc. Microfluidic device provides a lot of advantages for the analysis and production of target molecules by integration of micro-scale components for various functions. In this study, a novel affinity separation method in a microfluidic aqueous two-phase extraction system (MATPES) is suggested using protein conjugated IgG as a ligand. As a model system, horseradish peroxidase and human IgG was used as a ligand carrier and affinity ligand, respectively. In macro-scale experiment, rabbit anti-human IgG was successfully separated into a PEG-rich phase from the mixture with goat anti-mouse IgG when the conjugated human IgG-HRP was used as a ligand. The appropriate molar ratio between human IgG-HRP and rabbit anti-human IgG was 3:1 and 1:1 in ATPSs, respectively. The yield and purity of the recovered rabbit anti-human IgG were 90.8 and 87.7%, respectively, in the dextran based ATPS, while those in the salt based ATPS were 78.2 and 73.2%.