High-performance frontal analysis for drug–protein binding study

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Recently, high-performance frontal analysis (HPFA) had been developed and demonstrated as an alternate chromatographic method suitable for the analysis of strong binding properties of protein-drugs because the bound drugs are transformed into unbound form in the column, which improve the measurement of low levels of unbound drug. This method can be free from the protein leakage and drug absorption existed in the conventional ultrafiltration and dialysis method for its gel filtration mechanism. In this work, the principle and feature of the HPFA methods were reviewed and the applications for protein binding study of perillyl alcohol enantiomers, Sibuprofen, and isoflavones (daidzein, genistin, and genistein) to human serum albumin were also studied. The unbound drug concentration was calculated from the peak height of the zonal peak and Scatchard analysis was used for evaluation of the binding constant and binding affinity of the drugs to human serum albumin. The quantitative investigation of drug-binding is essential in pharmacokinetic study and pharmacodynamic studies.