OP-25

Novel Thermally Assisted On-Line Solid Phase Extraction-Reversed Phase Liquid Chromatography to Perform High Throughput Targeted Nutrimetabolomics in Human Biofluids

Lapo RENAI[1], Luca MARZULLO[1], Giulia BONACCORSO[1], Serena ORLANDINI[1], Maria Concetta BRUZZONITI[2], Massimo DEL BUBBA[1]

[1]Department of Chemistry, University of Florence, Via Della Lastruccia 3, 50019, Sesto Fiorentino, Florence, Italy;
[2] Department of Chemistry, University of Turin, Via Pietro Giuria 7, 10125, Turin, Italy;
lapo.renai@unifi.it

This study proposes and demonstrates the use of thermal desorption in on-line solid phase extraction coupled with reversed-phase liquid chromatography (on-line SPE-LC) for the desorption of analytes strongly retained by multiple interaction polymeric sorbents [1].

In detail, this analytical strategy was applied to the on-line SPE-LC targeted analysis of a model set of 34 human gut metabolites characterized by heterogeneous physicochemical properties (i.e., octanol–water partition coefficient in the range -0.3 – 3.4).

The novel thermally assisted on-line SPE approach was investigated in comparison to conventional room temperature desorption strategies based on the use of (i) an optimized elution gradient or (ii) organic desorption followed by post-cartridge dilution.

The thermally assisted desorption strategy has been shown to be better performing and suitable for the development of a reliable and sensitive method for the analysis of the model group of analytes in urine and serum. In more detail, under the optimized experimental conditions, the proposed method provided negligible matrix effects in both biofluids for almost all target analytes.

Moreover, method quantification limits were in the ranges 0.026-7.2 µg L^{-1} and 0.033-23 µg L^{-1} for urine and serum, respectively, i.e., comparable to or lower than those reported in methods previously published [2,3].

References
[1] D. Sýkora, P. Řezanka, K. Záruba, V. Král. Journal of Separation Science 42(1) (2019) 89-129.
Doi: 10.1002/jssc.201801048
[2] M. Gasperotti, D. Masuero, G. Guella, F. Mattivi a, U. Vrhovsek. Talanta 128 (2014) 221-230.
Doi: 10.1016/j.talanta.2014.04.058
[3] R. González-Domínguez, O. Jáuregui, P. Mena, K. Hanhineva, F. J. Tinahones, D. Angelino, C. Andrés-Lacueva. International Journal of Obesity 44 (2020) 2372-2381. Doi: 10.1038/s41366-020-0628-1